ADAMA SCINCE AND TECHNOLOGY UNIVERSITY

SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTING

DEPARTMENT OF SOFTWARE ENGINEERING

SOFTWARE PROCESS AND PROJECT MANAGEMENT

DIGITAL ADDRESS REGISTRATION SYSTEM

Group Members	ID No.	Section
1. Remedan Hyredin	UGR/22718/13	3
2. Bereket Bamlak	UGR/22826/13	3
3. Reduwan Mudesir	UGR/22887/13	3
4. Selahadin Hamid	UGR/22836/13	3

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Table of Contents

Introduction

The Digital Address Registration System (DARS) project is a groundbreaking initiative aimed at revolutionizing address management in Ethiopia. This comprehensive digital system is designed to enhance the accuracy, usability, and speed of address information, making it more accessible and efficient for individuals and organizations alike.

The primary objective of the DARS project is to develop a digital address system that encompasses the entire hierarchy of address components in Ethiopia, starting from regional details and extending down to house numbers. By transitioning address data into a digital format, the project aims to eliminate the limitations and inaccuracies associated with paper-based records and fragmented digital databases.

One of the key goals of the DARS project is to make address information easily accessible to users worldwide through a web-based platform. This digital address system will serve as the foundation for future developments in address registration and management in Ethiopia, providing a unified and comprehensive database for various purposes.

The DARS project offers a range of essential features, including user registration and login functionalities, an interactive map for address exploration and search, and the ability for users to contribute address information to improve the accuracy and coverage of the database. The system also incorporates a robust address management system to ensure the maintenance of accurate and up-to-date information.

Throughout the development process, the project has faced challenges, particularly in terms of limited data availability for certain address components. However, the team has made diligent efforts to address these limitations and has successfully achieved the intended functionality of the DARS website, which is now operational.

With its user-friendly interface and comprehensive address registration capabilities, the DARS project is poised to play a crucial role in advancing address registration and management in Ethiopia. By making the process more efficient and accessible, the system has the potential to significantly improve services and contribute to the overall development of the country.

In the following sections of this documentation report, we will delve into the background information, purpose, objectives, methodology, requirements analysis, design, development, testing, implementation, and maintenance plans of the DARS project, providing a comprehensive overview of its scope and functionalities.

Purpose

The purpose of the Digital Address Registration System (DARS) project is to revolutionize address management in Ethiopia by developing a comprehensive and reliable digital platform for registering and organizing addresses. The project aims to address the existing gaps in digital address management in Ethiopia, where address data is primarily paper-based, leading to inaccuracies and outdated records.

The main purpose of DARS is to enhance the accuracy, usability, and speed of handling address information, making it more accessible and efficient for users worldwide. By digitizing address data from regions down to individual house numbers, the project seeks to establish the first digital address system in Ethiopia and create a foundation for future developments.

DARS also aims to integrate with other systems to enhance services in the country. Overall, the purpose of the project is to advance address registration and management in Ethiopia, improving efficiency and accessibility for individuals, organizations, and government entities.

Scope

The scope of the DIGITAL project, specifically the Digital Address Registration System (DARS), is to revolutionize address management in Ethiopia through the development of a comprehensive digital address system. The project aims to cover all regions, zones, districts (woredas), neighborhoods (kebeles), streets (menders), and houses throughout Ethiopia.

The key features and functionalities included in the scope of the project are as follows:

1. Development of a digital address system: The project focuses on creating a digital platform that registers and organizes addresses in Ethiopia. This includes capturing and storing address information starting from the regional level and extending down to individual house numbers.

2. Global accessibility: The DARS website is designed to be accessible to users worldwide. It aims to provide a reliable digital platform for addresses that can be accessed and utilized by anyone in the world.

3. User registration and login functionalities: The system allows users to register and create accounts, enabling them to access and interact with the address database.

4. Interactive map: The DARS website incorporates an interactive map feature that allows users to explore and search for addresses. This feature enhances user experience and facilitates address lookup.

5. User contribution: Users have the ability to contribute address information to enhance the accuracy and coverage of the address database. This participatory approach ensures that the system becomes comprehensive and useful to all users.

6. Robust address management system: The project includes the development of a robust system to maintain accurate and up-to-date address data. This ensures that the address information stored in the database is reliable and reflects the current state of addresses in Ethiopia.

7. User-friendly interface: The DARS website is designed with a user-friendly interface to cater to a diverse audience, including government entities and the general public. The interface is intuitive and easy to navigate, promoting accessibility and usability.

It is important to note that while the project has successfully achieved its intended functionality, there are limitations due to limited data availability. Contributions from users are required to complete data on kebeles, menders, and house numbers, making the system as inclusive and comprehensive as possible.

Definition

1. Digital Address Registration System (DARS): A web-based system developed to improve address management in Ethiopia by providing a comprehensive and reliable digital platform for registering and organizing addresses. DARS aims to create an accessible and efficient address system that can be used by anyone worldwide.

2. Address Management: The process of organizing and maintaining accurate and up-to-date address information, including regions, zones, districts (woredas), neighborhoods (kebeles), streets (menders), and houses. Address management ensures the reliability and accessibility of address data.

3. User Registration: A feature of the DARS that allows users to create accounts and provide their personal information in order to access and utilize the system's functionalities. User registration enables personalized interactions and data contributions.

4. Interactive Map: A component of the DARS that provides users with a visual representation of addresses and allows them to explore and search for specific locations. The interactive map enhances user experience and facilitates address identification.

5. Database: A structured collection of data stored in a digital format. In the context of the DARS, the database contains address-related information, including regions, zones, districts,

neighborhoods, streets, and house numbers. The database ensures the storage, retrieval, and management of address data.

6. Front-end Development: The process of creating the user interface and visual elements of a website or application. In the context of the DARS, front-end development involves using technologies such as HTML, CSS, Bootstrap, and JavaScript to design and implement the user interface of the web-based system.

7. Backend Development: The development of the server-side components and functionalities of a website or application. In the DARS, backend development includes tasks such as data handling, validation, and database management using technologies such as PHP, MySQL, and AJAX.

8. Functional Requirements: The specific features and functionalities that the DARS must possess in order to meet the needs and objectives of the project. Functional requirements describe the tasks and capabilities that the system should perform, such as user registration, interactive map, and address information contribution.

9. Non-Functional Requirements: The performance, usability, and quality criteria that the DARS should meet. Non-functional requirements define aspects such as system reliability, scalability, security, and user-friendliness. They focus on the overall characteristics and constraints of the system rather than specific functionalities.

10. User Stories: Narrative descriptions of specific interactions and tasks that users of the DARS might perform. User stories capture the perspective and needs of different user roles and help in understanding and designing the system from a user-centered approach.

11. Use Case: A representation of a specific interaction or scenario between users and the DARS. Use cases illustrate the steps, actions, and expected outcomes of user interactions with the system, providing a detailed understanding of system behavior and functionality.

12. Stakeholder Analysis: The identification, analysis, and understanding of individuals or groups (stakeholders) who have an interest or influence in the DARS project. Stakeholder analysis helps in identifying their needs, expectations, and potential impacts on the project's success.

13. Architectural Overview: An overview of the system's architecture, including the components, modules, and their interactions. The architectural overview provides a high-level understanding of how the different parts of the DARS are structured and connected.

14. Database Schema: The structure and organization of the database tables and relationships in the DARS. The database schema defines the data model and ensures the integrity and consistency of address-related information.

15. Interface Design: The visual and interactive design of the user interface in the DARS. Interface design focuses on creating an intuitive and user-friendly layout, navigation, and interactions to enhance the user experience.

16. Data Flow Diagram: A graphical representation of the flow of data within the DARS. Data flow diagrams illustrate how information moves between different components and processes in the system, highlighting inputs, outputs, and data transformations.

17. Testing and Quality Assurance: The process of evaluating the functionality, performance, and reliability of the DARS to ensure it meets the specified requirements. Testing and quality assurance activities include unit testing, integration testing, and the creation and execution of test cases.

18. Deployment Process and Platform: The steps and procedures involved in deploying the DARS to a production environment. The deployment process includes activities such as configuring servers, installing software, and ensuring the system is available for use. The deployment platform refers to the hardware and software infrastructure on which the DARS is hosted.

19. Bug Tracking and Resolution Process: The process of identifying, documenting, and resolving software bugs or issues in the DARS. Bug tracking involves capturing and managing bug reports, prioritizing and assigning them to developers, and tracking their resolution to ensure the system's stability and reliability.

20. User Documentation: Documentation that provides instructions, guidelines, and explanations to users on how to use the DARS effectively. User documentation helps users

understand the system's functionalities, workflows, and features, enabling them to utilize the system efficiently.

21. Maintenance and Future Improvements: Activities and plans for maintaining and enhancing the DARS after its implementation. Maintenance involves monitoring, troubleshooting, and updating the system to ensure its continuous operation and performance. Future improvements refer to planned enhancements, updates, or additional features that may be incorporated into the DARS to address evolving needs and technological advancements.

Acronyms

Acronyms used in the documentation:

1. DARS - Digital Address Registration System

2. UGR - University Graduate Registration

3. ID - Identification

4. HTML - Hypertext Markup Language

5. CSS - Cascading Style Sheets

6. AJAX - Asynchronous JavaScript and XML

7. XAMPP - Cross-platform (X), Apache (A), MariaDB/MySQL (M), PHP (P), Perl (P)

8. PHP - Hypertext Preprocessor

9. MySQL - Structured Query Language

10. API - Application Programming Interface

11. UI - User Interface

12. UX - User Experience

13. GPS - Global Positioning System

14. HTTP - Hypertext Transfer Protocol

15. HTTPS - Hypertext Transfer Protocol Secure

16. DNS - Domain Name System

17. IP - Internet Protocol

18. OS - Operating System

19. QA - Quality Assurance

20. UI/UX - User Interface/User Experience

21. CRUD - Create, Read, Update, Delete

22. FAQ - Frequently Asked Questions

23. MVP - Minimum Viable Product

24. ISO - International Organization for Standardization

25. GDPR - General Data Protection Regulation

26. SSL - Secure Sockets Layer

27. API - Application Programming Interface

28. CMS - Content Management System

29. SDK - Software Development Kit

30. NDA - Non-Disclosure Agreement

Overall Description

Overall Description (Product Perspective)

The Digital Address Registration System (DARS) is a groundbreaking project aimed at revolutionizing address management in Ethiopia. It is a comprehensive digital platform that addresses the existing gaps in address registration and provides a reliable and accessible system for managing addresses at various levels.

The main objective of DARS is to develop a digital address system that covers regions, zones, districts (woredas), neighborhoods (kebeles), streets (menders), and individual houses. The system is designed to be user-friendly and accessible to anyone, anywhere in the world, via the internet.

From a product perspective, DARS offers a range of essential features and functionalities. Users can register and login to the system, enabling them to contribute and access address information. The system provides an interactive map that allows users to explore and search for addresses within Ethiopia. Users can also add address information to enhance the accuracy and coverage of the database.

The address management system within DARS ensures that the data is accurate and up-to-date. It employs a robust database schema and data validation techniques to maintain the integrity of the address information. The system is designed to be scalable and can accommodate future developments and potential integration with other systems to enhance services in Ethiopia.

The development of DARS involved a combination of front-end and back-end technologies. HTML, CSS, Bootstrap, and JavaScript were used for front-end development, providing a visually appealing and user-friendly interface. The back-end development utilized PHP and MySQL for data handling and database management, ensuring the reliability and performance of the system.

While the project faced challenges regarding data availability, the team made diligent efforts to address these limitations. The DARS website is now operational, poised to play a crucial role in advancing address registration and management in Ethiopia. It aims to make the process more efficient and accessible, contributing to improved services and addressing the existing gaps in address management.

The Digital Address Registration System (DARS) is a significant step forward in improving address management in Ethiopia. It provides a comprehensive and user-friendly digital platform for registering, organizing, and accessing address information at various levels. With its wide range of features and the potential for future enhancements, DARS is set to make a significant impact on address registration and management in Ethiopia.

Overall Description (Function)

The Digital Address Registration System (DARS) is a comprehensive digital platform developed to revolutionize address management in Ethiopia. Its main function is to provide an efficient and accessible system for registering, organizing, and maintaining accurate address information throughout the country.

The primary purpose of DARS is to digitize all addresses in Ethiopia, starting from regional details down to individual houses. By transitioning from paper-based records to a digital format, DARS aims to enhance the accuracy, usability, and speed of handling address information.

The system offers a range of key features to facilitate address registration and management. Users can register and log in to the system, allowing them to access and contribute to the address database. DARS includes an interactive map that enables users to explore and search for addresses easily.

One of the significant functions of DARS is to ensure the accuracy and up-to-date nature of address information. It employs a robust address management system that maintains the integrity of the database. Users can contribute address information, thereby improving the coverage and accuracy of the system.

DARS is designed to be user-friendly, catering to a diverse audience, including government entities and the general public. It provides a seamless user interface that allows users to interact with the system effortlessly.

The development of DARS involved a combination of front-end and back-end technologies. HTML, CSS, Bootstrap, and JavaScript were used for front-end development, ensuring a visually appealing and responsive user interface. The system utilizes a MySQL database managed by XAMPP, ensuring reliability and performance in storing and managing address-related information. PHP and AJAX were employed for data handling, validation, and dynamic data retrieval, enhancing the overall efficiency of the system.

DARS aims to establish the first digital address system in Ethiopia, addressing the current limitations and challenges in address management. It strives to provide a reliable and accessible digital platform for address registration, making the process more efficient for users and contributing to the advancement of address management in Ethiopia.

Overall Description (User Class and Characteristics)

Based on the given documentation, the user class of the Digital Address Registration System (DARS) can be described as follows:

Description:

The DARS system is designed to cater to a diverse range of users, including individuals, government entities, and organizations, both within Ethiopia and worldwide. The system aims to provide an efficient and user-friendly platform for address registration and management. Users of the DARS system can access and contribute to the database of addresses in Ethiopia, ranging from regional details to individual houses. The system offers various features and functionalities to meet the needs of different user groups.

Characteristics:

1. General Users: The system welcomes general users who wish to search for addresses, verify existing addresses, or contribute new address information. These users may include residents, businesses, and tourists seeking accurate and up-to-date address details.

2. Government Entities: Government entities at different levels, such as regional administrations, zoning departments, and local authorities, can utilize the DARS system to enhance address management and planning. They may access the system to retrieve address information, update records, and ensure the accuracy of address data within their respective jurisdictions.

3. Organizations: Organizations, including NGOs, research institutions, and service providers, can benefit from the DARS system. They can use the system to access address information for planning, analysis, and service delivery purposes. Additionally, organizations may contribute address data to improve the overall coverage and accuracy of the system.

4. Technical Users: The system caters to technical users, such as developers and IT professionals, who may be involved in the maintenance, enhancement, or integration of the DARS system. These users may interact with the system's backend, database, and APIs to ensure its smooth operation and integration with other systems.

5. User Characteristics: Users of the DARS system are expected to have basic computer literacy and internet access. They should be able to navigate web-based interfaces, perform searches, and interact with the system's features. Depending on their roles and privileges, users may need to register and log in to access certain functionalities.

The DARS system aims to be inclusive and user-centric, accommodating a wide range of users with varying needs and technical proficiency. By providing a user-friendly interface, accurate address information, and interactive features, the system strives to enhance address registration and management in Ethiopia, making it more accessible and efficient for all users.

Operating Environment

The Digital Address Registration System (DARS) is designed to operate within a specific environment to ensure its functionality and accessibility. The operating environment for DARS includes the following components:

1. Web Server: DARS requires a web server to host the website and serve web pages to users. The web server should support PHP scripting language and be compatible with the chosen database management system.

2. Database Management System: DARS utilizes a relational database management system (RDBMS) to store and manage address-related information. The system described in the documentation uses MySQL as the RDBMS. Therefore, the operating environment should include a compatible version of MySQL or a similar RDBMS.

3. Backend Technologies: The backend development of DARS involves scripting languages such as PHP and server-side technologies like AJAX. The operating environment should have support for these technologies, including the necessary libraries and modules.

4. Frontend Technologies: The frontend of DARS relies on HTML, CSS, Bootstrap, and JavaScript for creating the user interface and implementing interactive features. The operating environment should support these technologies to ensure proper rendering and functionality of the website.

5. Web Browsers: DARS is designed to be accessed through web browsers. Therefore, the operating environment should include commonly used web browsers such as Google Chrome, Mozilla Firefox, Safari, or Microsoft Edge. Compatibility testing should be performed to ensure DARS functions correctly across different browser versions.

6. Internet Connectivity: DARS is an online system that relies on internet connectivity to access address information, interact with the database, and provide global accessibility. The operating environment should have a stable internet connection to ensure seamless usage of the system.

7. Hardware Infrastructure: The hardware infrastructure required for DARS includes a reliable server or hosting platform to deploy the web application. The server should have sufficient processing power, memory, and storage capacity to handle user requests and store the address database.

It's important to note that specific system requirements, such as minimum hardware specifications, software versions, and compatibility, may vary based on the scale of deployment and expected user load. Therefore, it is recommended to conduct a detailed analysis and testing of the operating environment to ensure optimal performance and reliability of the DARS system.

Assumptions and Dependencies

Assumptions

1. Availability of Internet Access: It is assumed that users will have access to the internet in order to access and utilize the Digital Address Registration System (DARS) website.

2. User Adoption: It is assumed that users, including individuals, businesses, and government entities, will adopt and actively use the DARS system for address registration and management.

3. User Contribution: The assumption is made that users will contribute address information to enhance the accuracy and coverage of the address database, particularly for kebeles, menders, and house numbers where data may be limited.

4. Data Accuracy: It is assumed that the address information provided by users will be accurate and reliable, ensuring the integrity of the database.

5. Technical Infrastructure: The assumption is made that the necessary technical infrastructure, including servers, databases, and network resources, will be available and properly maintained to support the operation of the DARS system.

Dependencies

1. Data Availability: The successful implementation and completion of the DARS system depend on the availability of comprehensive and up-to-date address data for regions, zones, woredas, kebeles, menders, and house numbers. The system relies on the contribution of users to fill in any data gaps.

2. User Engagement: The effectiveness of the DARS system is dependent on active user engagement and participation in registering addresses and maintaining accurate information. Without user involvement, the system's coverage and usefulness may be limited.

3. Internet Infrastructure: The availability and reliability of internet infrastructure, including network connectivity and bandwidth, are essential dependencies for the DARS system to function properly. The system relies on internet access for users to access the website and contribute/address information.

4. Technical Expertise: The development, deployment, and maintenance of the DARS system require technical expertise in areas such as front-end and back-end development, database management, and system administration. The availability of skilled personnel or external support is crucial for ensuring the system's smooth operation.

5. Integration with Other Systems: The potential integration of DARS with other systems to enhance services in Ethiopia depends on the compatibility and cooperation of those systems. The successful integration requires coordination and collaboration with relevant stakeholders and system providers.

Specific Requirements

Functional Requirements

1. User Registration: The system should provide a user registration functionality, allowing individuals and organizations to create user accounts with unique credentials.

2. User Login: The system should allow registered users to log in securely using their credentials, providing access to their personalized accounts.

3. Address Registration: The system should enable users to register new addresses, including regions, zones, woredas, kebeles, menders, and house numbers. The registration process should include appropriate validation checks to ensure data accuracy.

4. Address Search: The system should provide a search functionality that allows users to search for specific addresses based on different criteria, such as region, zone, woreda, kebele, or house number. The search results should be displayed in a clear and user-friendly manner.

5. Interactive Map: The system should incorporate an interactive map feature that allows users to visually explore and locate addresses. The map should provide zooming, panning, and other interactive functionalities to enhance the user experience.

6. User Contributions: The system should allow users to contribute additional address information to improve the accuracy and coverage of the address database. Users should have the ability to suggest updates, corrections, or additions to existing addresses.

7. Address Management: The system should provide a robust address management functionality to ensure that registered addresses are maintained accurately and kept up-to-date. This includes the ability to modify, delete, or archive addresses as necessary.

8. User-Friendly Interface: The system should have a user-friendly interface that is intuitive and easy to navigate. It should provide clear instructions and guidance to users during the address registration and search processes.

9. Data Validation: The system should perform validation checks on user-provided address information to ensure that it meets predefined standards and formats. Invalid or incomplete addresses should be flagged for correction.

10. Data Security: The system should implement appropriate security measures to protect user data and address information from unauthorized access, manipulation, or disclosure. This includes encryption of sensitive data and secure storage practices.

11. Accessibility: The system should be designed to be accessible to a wide range of users, including individuals with disabilities. It should adhere to accessibility standards and provide features such as screen reader compatibility and keyboard navigation.

12. Reporting and Analytics: The system should have reporting and analytics capabilities to generate insights and statistics related to address registration, usage, and data quality. This information can help in identifying areas for improvement and monitoring system performance.

13. System Administration: The system should provide administrative functionalities to manage user accounts, monitor system usage, perform backups, and handle system configuration and updates.

14. Integration with External Systems: The system should have the capability to integrate with other relevant systems or databases to enhance address services and enable data sharing and interoperability, subject to necessary permissions and agreements.

Non-Functional Requirements

Performance Requirement

Based on the given documentation, the performance requirements for the Digital Address Registration System (DARS) can be outlined as follows:

1. Response Time:

➢ The system should provide quick response times for user interactions, such as searching for addresses, adding address information, and accessing the interactive map.

➢ The website pages should load within an acceptable timeframe to ensure a smooth user experience.

➢ The database queries and data retrieval processes should be optimized to minimize response delays.

2. Scalability:

➢ The system should be designed to handle a large volume of address data and user traffic.

➢ It should be scalable to accommodate future growth and increasing demand for address registration and management services.

➢ The database architecture and server infrastructure should be capable of scaling up to support the growing user base.

3. Availability:

➢ The DARS website should be available and accessible to users at all times, with minimal downtime for maintenance or upgrades.

➢ The system should have measures in place to handle potential failures, such as redundant servers or backup systems, to ensure continuous availability.

4. Data Accuracy and Integrity:

➢ The system should maintain accurate and up-to-date address data to provide reliable information to users.

➢ Data validation mechanisms should be implemented to ensure the integrity of address information entered by users.

➢ Changes or updates to address data should be reflected in the system in a timely manner.

5. Concurrent User Handling:

➢ The system should be capable of handling multiple concurrent users without significant performance degradation.

➢ It should be able to manage simultaneous user requests for address registration, data retrieval, and system interactions without compromising performance.

6. User Experience:

➢ The system's user interface should be intuitive, responsive, and user-friendly to enhance the overall user experience.

➢ The interactive map should provide smooth navigation and seamless address search capabilities.

➢ System feedback, such as success messages or error notifications, should be provided promptly to keep users informed.

These performance requirements aim to ensure that the DARS operates efficiently, delivers a satisfactory user experience, and can effectively handle the address registration and management needs of users in Ethiopia.

Usability Requirements

Usability Requirements:

1. User-Friendly Interface: The digital address registration system (DARS) should have an intuitive and user-friendly interface that is easy to navigate and understand. Users, including government entities and the general public, should be able to interact with the system without difficulty.

2. Clear and Consistent Design: The system should follow a clear and consistent design language throughout its interface. This includes using standardized icons, buttons, and menus, as well as maintaining a cohesive color scheme and typography.

3. Responsive Design: The DARS website should be responsive and adaptable to different screen sizes and devices. It should provide a seamless user experience whether accessed from desktop computers, laptops, tablets, or mobile phones.

4. Efficient Address Search: The system should provide a search functionality that allows users to quickly and accurately find addresses. The search feature should support various search parameters, such as region, zone, woreda, kebele, street, and house number, and deliver relevant results in a timely manner.

5. Interactive Map: DARS should incorporate an interactive map feature that allows users to visually explore and locate addresses. The map should support zooming, panning, and clicking on map markers to display address details.

6. Clear Data Input and Validation: When users contribute address information to the database, the system should provide clear instructions and validation mechanisms to ensure the accuracy and completeness of the entered data. It should notify users of any errors or missing information and guide them in correcting the input.

7. Accessible Design: DARS should adhere to accessibility standards to accommodate users with disabilities. This includes providing alternative text for images, ensuring proper color contrast for readability, and enabling keyboard navigation for those who cannot use a mouse.

8. Performance and Speed: The system should be optimized for fast loading times and smooth performance, even when handling a large amount of data. Users should not experience significant delays or lags when interacting with the system.

9. Compatibility: The system should be compatible with popular web browsers, ensuring a consistent experience across different browser platforms. Compatibility testing should be conducted to verify the system's performance and functionality on various browsers.

10. Scalability: The DARS system should be designed with scalability in mind to accommodate future growth and increasing user demands. It should be able to handle a growing number of registered addresses and users without significant performance degradation.

Security Requirement

Security Requirements:

1. Authentication and Authorization:

- The system should implement a secure authentication mechanism to ensure that only authorized users can access and modify address information.
- User registration and login functionalities should be implemented with proper password management practices, such as strong password requirements, password hashing, and secure storage.
- Role-based access control should be implemented to limit user privileges and access rights based on their roles and responsibilities within the system.
- Access to sensitive information and administrative functions should be restricted to authorized personnel only.

2. Data Privacy and Confidentiality:

➢ The system should protect the privacy and confidentiality of address information and user data.

➢ Personal identifiable information (PII) should be encrypted during storage and transmission to prevent unauthorized access.

➢ Adequate measures should be in place to prevent data breaches, unauthorized disclosure, or unauthorized use of data.

➢ Compliance with relevant data protection regulations and policies should be ensured.

3. Secure Communication:

➢ All communication between the system and users should be encrypted using secure protocols such as HTTPS to protect data integrity and prevent eavesdropping.

➢ Secure Socket Layer (SSL) certificates should be implemented to establish secure connections between clients and the system.

4. Secure Database Management:

➢ The database should be protected against unauthorized access, both physically and logically.

➢ Strong access controls and permissions should be implemented to restrict database access to authorized personnel only.

➢ Regular database backups should be performed to prevent data loss and enable recovery in case of system failures or security incidents.

System Feature

Based on the given documentation, the system features of the Digital Address Registration System (DARS) can be outlined as follows:

1. User Registration and Login Functionalities: The system provides user registration and login functionality, allowing users to create accounts and access the DARS platform with personalized credentials.

2. Interactive Map: DARS includes an interactive map feature that enables users to explore and search for addresses. Users can navigate through regions, zones, districts (woredas), neighborhoods (kebeles), streets (menders), and houses using the map interface.

3. Address Contribution: Users have the ability to contribute address information to enhance the accuracy and coverage of the database. This feature allows users to add missing or updated address details, ensuring that the system maintains up-to-date information.

4. Robust Address Management System: DARS incorporates a robust address management system that ensures the accuracy and integrity of the address data. The system is designed to maintain reliable and up-to-date information, minimizing inaccuracies and outdated records.

5. User-Friendly Interface: The DARS platform is designed with a user-friendly interface, catering to a diverse audience ranging from government entities to the general public. The interface is intuitive and easy to navigate, enhancing user experience and accessibility.

6. Comprehensive Address System: DARS aims to establish a comprehensive address system for Ethiopia, starting from regions and extending down to house numbers. The system covers various administrative levels such as regions, zones, districts, neighborhoods, streets, and individual houses, providing a connected address system throughout the country.

7. Global Accessibility: The web-based nature of DARS enables global accessibility, allowing users from anywhere in the world to access and utilize the address registration system. This feature ensures that the address information is accessible to a wide range of users, including individuals, businesses, and organizations.

Appendices

Glossary

1. DARS: Digital Address Registration System. It refers to the website and digital platform developed to register and manage addresses in Ethiopia.

2. Address Management: The process of organizing, updating, and maintaining address information, including regions, zones, woredas, kebeles, streets, and houses.

3. User Registration: The process by which individuals create an account on the DARS website, providing their personal information to access the system's features.

4. Interactive Map: A graphical representation on the DARS website that allows users to explore and search for addresses visually.

5. Database: A structured collection of data stored electronically, containing address-related information in the DARS system.

6. Front-end Development: The process of creating the user interface and user experience of the DARS website using technologies such as HTML, CSS, Bootstrap, and JavaScript.

7. Back-end Development: The process of developing the server-side components and functionalities of the DARS website, including data handling, validation, and connection with the database.

8. Functional Requirements: The specific features and functionalities that the DARS system must possess to meet the needs and objectives of the project.

9. Non-Functional Requirements: The criteria that define the quality and performance characteristics of the DARS system, such as reliability, security, usability, and scalability.

10. User Stories: Descriptions or narratives that illustrate how users will interact with the DARS system, highlighting their needs, goals, and expected outcomes.

11. Use Case: A representation of the interactions between users and the DARS system, describing the steps and actions involved in accomplishing specific tasks or scenarios.

12. Stakeholder Analysis: The identification and analysis of individuals, organizations, or groups that have an interest or influence in the development and implementation of the DARS system.

13. Architectural Overview: An overview of the overall structure and components of the DARS system, including the front-end, back-end, and database.

14. Database Schema: A visual representation of the structure and organization of the database tables, relationships, and attributes used in the DARS system.

15. Interface Design: The visual and functional design of the user interface elements and screens in the DARS system, ensuring a user-friendly and intuitive experience.

16. Data Flow Diagram: A graphical representation of the flow of data within the DARS system, illustrating how information moves between different components and processes.

17. Data Validation and Integrity: The process of verifying the accuracy, completeness, and consistency of address data entered into the DARS system to ensure its reliability and usefulness.

18. Unit Testing: The process of testing individual components or modules of the DARS system to ensure their proper functionality and behavior.

19. Integration Testing: The process of testing the interaction and compatibility between different components and modules of the DARS system to ensure their seamless integration.

20. Bug Tracking and Resolution Process: The procedures and tools used to identify, report, track, and resolve software bugs and issues in the DARS system during development and implementation.

21. Deployment Process and Platform: The steps and methods involved in deploying the DARS system onto a specific platform or server to make it accessible to users.

22. User Documentation: Documentation and instructions provided to users of the DARS system, guiding them on how to use its features and functionalities effectively.

Note

"This is the SRS documentation when we start developing the Digital address registration system so their will be some changes in the future or in the final documentation (some features may be added or removed). "