Software Requirements Specification

AgroConnect Pro

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1 Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document outlines the functional and non-functional requirements for AgroConnect Pro, an e-commerce platform specializing in the distribution of raw food materials such as grains, crops, etc. This document pertains to the initial release of the software, version
1.0.

1.2 Document Conventions

The following conventions are used in this document: • Priority levels for requirements are denoted using the following symbols: **M** (Must-have), **S** (Should-have), and **C** (Could-have).

- Requirements are numbered hierarchically, with higher-level requirements being inherited by detailed requirements.

1.3 Intended Audience and Reading Suggestions

This document is intended for various stakeholders involved in the development and usage of AgroConnect Pro, including developers, project managers, marketing staff, users, testers, and documentation writers.

The SRS is organized as follows:

- Section 1 provides an introduction to the document, including its purpose, conventions, intended audience, and reading suggestions.
- Section 2 defines the overall description of the product, including its perspective, functions, user classes, operating environment, design constraints, user documentation, assumptions, and dependencies.
- Section 3 lists the specific requirements of AgroConnect Pro in detail.

For an overview, readers are suggested to start with Section 1 and proceed sequentially through the document.

1.4 Product Scope

AgroConnect Pro is a web-based e-commerce platform aimed at facilitating the distribution of raw food materials, with a focus on grains, crops, and other agricultural products. The software aims to connect farmers directly with consumers, providing a platform for buying and selling products based on geographical area and climate.

1.5 References

1. Vision and Scope Document - [Insert Reference Details]
2. User Interface Style Guide - [Insert Reference Details]
3. System Requirements Specification - [Insert Reference Details]

2 Overall Description

2.1 Product Perspective

AgroConnect Pro is conceived as an independent and self-sufficient e-commerce platform with a primary objective of streamlining the distribution process of raw food materials. Unlike some e-commerce platforms that operate within a larger ecosystem or network of services, AgroConnect Pro stands alone as a comprehensive solution tailored specifically to the needs of farmers and consumers in the agricultural sector.

As a standalone platform, AgroConnect Pro operates autonomously, meaning it does not rely on or integrate with external systems or platforms for its core functionalities. Instead, it is designed to encompass all necessary features and services within its framework, providing a seamless and efficient experience for both farmers and consumers alike.

By focusing solely on the distribution of raw food materials, AgroConnect Pro is able to dedicate its resources and attention to addressing the unique challenges and requirements of this niche market segment. This includes developing specialized tools and functionalities to facilitate the buying and selling of agricultural products, such as advanced search and filtering options tailored to specific crop types, geographical regions, and climate conditions.

Furthermore, by serving as a self-contained product, AgroConnect Pro aims to establish direct connections between farmers and consumers, bypassing intermediary channels and streamlining the supply chain process. This not only benefits farmers by providing them with a direct platform to market and sell their products but also empowers consumers with greater access to a diverse range of high-quality, locally-sourced agricultural goods.

In summary, AgroConnect Pro is more than just an e-commerce platform; it is a dedicated solution designed from the ground up to meet the unique needs and requirements of the agricultural industry. Its standalone nature allows it to provide a tailored and efficient experience for users, fostering direct connections between farmers and consumers while enhancing the overall efficiency and sustainability of the raw food distribution process.

2.2 Product Functions

- **Allow farmers to list and sell their raw food materials:** This function empowers farmers by providing them with a user-friendly interface

  to showcase their agricultural products. Farmers can create detailed listings for their raw food materials, including information such as crop type, quantity, quality, pricing, and any additional details they wish to include. By listing their products on AgroConnect Pro, farmers gain visibility and access to a broader customer base, thereby increasing their sales opportunities and market reach.

- **Enable consumers to search for and purchase raw food materials:** AgroConnect Pro offers consumers a robust search functionality that allows them to discover and explore a wide range of raw food materials available on the platform. Consumers can search for products based on various criteria, including geographical area, crop type, and climate conditions. This feature enables consumers to find specific agricultural products that meet their preferences and requirements, enhancing their overall shopping experience and satisfaction. • **Provide filtering options based on geographical area and climate:** To further refine their search results and ensure accuracy, AgroConnect Pro offers advanced filtering options based on geographical area and climate. Consumers can specify their location and climate preferences to narrow down their search results and find products that are most relevant to their needs. This feature not only saves consumers time and effort but also ensures that they can find products that are suitable for their specific geographical region and climate conditions.

- **Facilitate secure online transactions, including payment processing and order management:** AgroConnect Pro prioritizes the security and convenience of online transactions for both farmers and consumers. The platform integrates secure payment processing systems that support various payment methods, ensuring that transactions are safe, reliable, and protected against fraud. Additionally, AgroConnect Pro provides robust order management functionalities, allowing users to track their orders, manage shipments, and handle any related transactions seamlessly. By prioritizing secure online transactions, AgroConnect Pro instills confidence in users and fosters trust in the platform as a reliable marketplace for raw food materials.

2.3 User Classes and Characteristics

2.3.1 Farmers

Farmers represent a significant user class in AgroConnect Pro, utilizing the platform on a regular basis to list and sell their raw food materials. They have a deep understanding of agricultural practices and rely on the platform to efficiently manage their products and reach potential buyers. Farmers may have varying levels of technical expertise, with some being highly proficient in using digital tools and others requiring more guidance and support.

2.3.2 Consumers

Consumers form the primary customer base for AgroConnect Pro, comprising individuals and businesses seeking to purchase raw food materials for various purposes. They exhibit diverse behaviors and preferences, with some using the platform frequently for their agricultural needs, while others may visit sporadically. Consumers prioritize intuitive search and purchasing functionalities that enable them to find and buy products quickly and conveniently. Despite their varied technical backgrounds, consumers expect a seamless and user-friendly experience when navigating the platform.

2.4 Operating Environment

AgroConnect Pro will operate in a web-based environment, leveraging the ubiquity and accessibility of the internet. It is designed to be platform-independent, ensuring compatibility with a wide range of devices and operating systems. Users can access the platform using modern web browsers such as Chrome, Firefox, Safari, and Edge, providing flexibility and convenience. To ensure scalability and reliability, AgroConnect Pro will be hosted on a scalable cloud infrastructure, allowing it to dynamically adjust resources based on user demand and traffic fluctuations.

2.5 Design and Implementation Constraints

The development of AgroConnect Pro is subject to various design and implementation constraints to ensure the robustness, security, and usability of the platform. These constraints include:

- Compliance with industry-standard security protocols for online transactions, safeguarding user data and financial information.
- Integration with third-party payment gateways for secure and seamless payment processing, enabling users to conduct transactions with confidence.

- Utilization of JavaScript frameworks such as Node.js for the backend and React for the frontend development, leveraging their efficiency and scalability to build a responsive and interactive user interface.
- Adherence to UI/UX design principles to deliver an intuitive and visually appealing user experience, enhancing usability and engagement.

2.6 User Documentation

User documentation is essential for guiding users in effectively utilizing the features and functionalities of AgroConnect Pro. The documentation will include:
• Comprehensive user manuals tailored for both farmers and consumers, providing step-by-step instructions on using the platform.

- On-line help resources accessible within the platform, offering contextual assistance and troubleshooting guidance to users.
- Tutorials and instructional videos covering various aspects of navigating the platform, managing accounts, conducting transactions, and leveraging advanced features.

2.7 Assumptions and Dependencies

The successful deployment and operation of AgroConnect Pro rely on certain assumptions and dependencies, including:

- Availability of stable internet connectivity for users accessing the platform, ensuring uninterrupted access to features and services.
- Integration with external APIs for retrieving real-time weather and geographical data, enriching the platform with valuable information for farmers and consumers.
- Compliance with relevant regulations and legal requirements governing ecommerce platforms, such as data protection laws, consumer rights, and taxation regulations.
- Dependence on third-party services for payment processing and geographical data, necessitating reliable partnerships and API integrations to fulfill essential functionalities.

3 External Interface Requirements

3.1 User Interfaces

The user interface for AgroConnect Pro will be web-based and will include the following components:

- Landing Page: The landing page will provide an attractive and informative overview of the platform, highlighting its key features and benefits to visitors. It will serve as the entry point for users, enticing them to explore further and engage with the platform.
- Search Interface: The search interface will feature a user-friendly search bar where users can input their desired criteria, such as geographical area and climate, to find relevant raw food materials. Advanced filtering options will be available to refine search results and provide a tailored browsing experience.
- Product Listing Page: Each product listing page will present detailed information about the listed products, including high-quality images, descriptions, pricing, availability, and seller details. Users will have the option to add products to their shopping cart directly from the listing page.
- Shopping Cart: The shopping cart will display a summary of the products added by the user for purchase. Users can review their selections, adjust quantities, and proceed to checkout seamlessly. The shopping cart will also calculate the total cost, including taxes and shipping fees, providing users with a clear overview of their order.
- User Account Dashboard: The user account dashboard will serve as a centralized hub for users to manage their profiles, view order history, track shipments, and update preferences. It will offer personalized features and functionalities tailored to the specific needs and preferences of individual users.

The design and layout of these interfaces will adhere to modern web design principles, focusing on responsiveness, accessibility, and user engagement. Detailed specifications for each interface component will be documented in a separate User Interface Specification document, ensuring consistency and coherence across the platform.

3.2 Hardware Interfaces

AgroConnect Pro is a web-based application and does not have direct hardware interfaces. It is compatible with standard hardware components such as desktop

computers, laptops, tablets, and smartphones, allowing users to access the platform from their preferred devices without any hardware restrictions.

3.3 Software Interfaces

AgroConnect Pro will integrate with the following software components to deliver its core functionalities:

- MySql: MySql will serve as the primary database management system for storing and retrieving product listings, user data, and transaction records. It will provide a scalable and flexible data storage solution, enabling efficient data management and retrieval operations. • php: php will power the backend infrastructure of AgroConnect Pro, providing a robust runtime environment for executing server-side code and handling HTTP requests. It will support asynchronous, event-driven programming, allowing for high-performance and scalable backend operations.

- (Html,Css,JS): React will be used to develop the frontend user interface of AgroConnect Pro, offering a modern and dynamic JavaScript library for building interactive and responsive web applications. It will facilitate the creation of reusable UI components, enabling a consistent and intuitive user experience across different pages and devices.

- Payment Gateway API: AgroConnect Pro will integrate with third-party payment gateways to enable secure and seamless payment processing for online transactions. The Payment Gateway API will facilitate communication between the platform and payment service providers, ensuring encrypted transmission of sensitive payment information and compliance with PCI DSS standards.

Communication between these software components will be facilitated via RESTful APIs, enabling seamless data exchange and interaction between the frontend and backend layers of AgroConnect Pro.

3.4 Communications Interfaces

AgroConnect Pro will utilize standard communication protocols for web-based applications, ensuring secure and efficient data transmission between different system components:

- HTTP/HTTPS: AgroConnect Pro will leverage the Hypertext Transfer Protocol (HTTP) and its secure variant, HTTPS, for client-server communication. HTTP/HTTPS will enable the transfer of data, requests, and responses between the frontend and backend components of the platform, facilitating seamless user interactions and system operations. • JSON: AgroConnect Pro will utilize the JavaScript Object Notation (JSON) format for

data interchange between the frontend and backend layers of the platform. JSON will enable the serialization and deserialization of structured data objects, ensuring efficient and standardized communication between different system components.

- SMTP: AgroConnect Pro will utilize the Simple Mail Transfer Protocol (SMTP) for sending transactional emails and notifications to users. SMTP will enable the platform to deliver important messages, such as order confirmations, shipment notifications, and account updates, to users' email addresses, ensuring timely and reliable communication.

Communication security will be ensured through HTTPS encryption, which will encrypt data transmitted over the network, protecting sensitive information such as user credentials, payment details, and personal data from unauthorized access and interception.

4 System Features

4.1 System Feature 1: Product Search

4.1.1 Description and Priority

The Product Search feature allows users to search for raw food materials based on geographical area and climate. This feature is of high priority as it is fundamental to the platform's functionality, enabling users to find relevant products efficiently.

4.1.2 Stimulus/Response Sequences

- Stimulus: When a user enters search criteria (such as location, crop type) and submits the search query.
- Response: The system retrieves relevant product listings matching the search criteria and presents them to the user in a structured format.

4.1.3 Functional Requirements

- REQ-1: The system shall provide a user-friendly search interface that guides users to input search criteria effectively.
- REQ-2: The system shall retrieve and display relevant product listings based on the search criteria entered by the user, ensuring accuracy and relevance.
- REQ-3: The system shall allow users to refine search results using filters such as location, crop type, and price range, enhancing the precision of search outcomes.

- REQ-4: The system shall handle errors gracefully and display appropriate error messages for invalid search queries, guiding users to correct their input effectively.

4.2 System Feature 2: User Authentication

4.2.1 Description and Priority

The User Authentication feature enables users to create accounts, log in, and manage their profiles securely. This feature is of high priority to ensure secure access to the platform's functionalities and protect user data.

4.2.2 Stimulus/Response Sequences

- Stimulus: When a user navigates to the login/register page.
- Response: The user enters login credentials or selects the register option. • Response: The system validates the credentials and grants access to authenticated users, or guides users through the registration process securely.

4.2.3 Functional Requirements

- REQ-5: The system shall provide options for users to log in or register for a new account, guiding users through the authentication process seamlessly. • REQ-6: The system shall validate user credentials during login and registration processes to ensure security and prevent unauthorized access. • REQ-7: The system shall securely store user account information, including passwords, using encryption algorithms to safeguard user data from unauthorized access or data breaches.
- REQ-8: The system shall allow users to update their profile information and manage account settings securely, providing users with control over their personal data.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

5.1.1 Response Time

The system shall respond to user actions (such as search queries, login requests) within 2 seconds under normal load conditions to ensure a responsive user experience and prevent user frustration due to slow responsiveness.

5.1.2 Throughput

The system shall support a minimum of 100 concurrent user sessions without degradation in performance to accommodate a large user base and peak traffic periods effectively, ensuring consistent access to platform functionalities for all users.

5.1.3 Scalability

The system architecture shall be designed to scale horizontally to accommodate increasing user traffic without service interruption or performance degradation, allowing the platform to grow seamlessly as user demand increases over time.

5.1.4 Rationale

These performance requirements ensure a responsive and scalable user experience, even under peak load conditions, enhancing user satisfaction and platform reliability.

5.2 Safety Requirements

5.2.1 Data Security

The system shall encrypt sensitive user data (such as passwords, payment information) using industry-standard encryption algorithms (such as AES-256) to protect user privacy and prevent unauthorized access or data breaches.

5.2.2 User Authentication

User authentication mechanisms shall be implemented to prevent unauthorized access to user accounts and protect user privacy, ensuring the security and integrity of user data throughout their interactions with the platform.

5.2.3 Rationale

These safety requirements aim to safeguard user data and prevent unauthorized access, ensuring the integrity and confidentiality of user information, which is

critical for maintaining user trust and compliance with data protection regulations.

5.3 Security Requirements

5.3.1 Authorization

The system shall enforce role-based access control (RBAC) to restrict access to sensitive functionalities based on user roles, ensuring that only authorized users have access to relevant functionalities and data, preventing unauthorized access or misuse of platform features.

5.3.2 Data Integrity

Data integrity checks shall be implemented to detect and prevent unauthorized tampering or modification of user data, ensuring the accuracy and reliability of user information stored within the platform, which is essential for maintaining data consistency and trustworthiness.

5.3.3 Rationale

These security requirements address authorization and data integrity concerns, ensuring that only authorized users have access to relevant functionalities and that user data remains accurate and trustworthy, which is essential for maintaining platform credibility and user satisfaction.

5.4 Software Quality Attributes

5.4.1 Usability

The system shall adhere to industry best practices for user interface design to ensure intuitive navigation and ease of use, enhancing user satisfaction and usability, and reducing the learning curve for new users interacting with the platform.

5.4.2 Reliability

The system shall have a mean time between failures (MTBF) of at least 1000 hours under normal operating conditions to ensure reliability and minimize downtime, ensuring consistent access to platform functionalities for all users and maintaining platform availability.

5.4.3 Rationale

These software quality attributes emphasize the importance of usability and reliability in providing a satisfactory user experience, enhancing user satisfaction

and platform credibility, which are critical for attracting and retaining users in a competitive market.

5.5 Business Rules

5.5.1 User Registration

Only users with valid email addresses shall be allowed to register for an account on the platform to ensure the authenticity of user accounts and prevent spam or fraudulent registrations, maintaining data quality and platform credibility.

5.5.2 Product Listing

Only registered farmers shall be permitted to list their products for sale on the platform, ensuring quality control and authenticity of product listings, which is essential for maintaining user trust and ensuring the quality of products available on the platform.

5.5.3 Rationale

These business rules govern user interactions and platform behavior, ensuring compliance with regulatory requirements and operational guidelines, and protecting user interests and data integrity, which are essential for maintaining platform credibility and user satisfaction.

6 Other Requirements

6.1 Database Requirements

6.1.1 Data Storage

The system shall use MongoDB as the primary database management system for storing product listings, user data, and transaction records. MongoDB offers scalability, flexibility, and robustness, making it suitable for handling large volumes of data and supporting the dynamic nature of the platform's content.

6.1.2 Data Backup

Regular backups of the database shall be performed daily to ensure data integrity and availability in case of system failure. Backup procedures shall include automated routines to minimize the risk of data loss and ensure timely recovery in the event of unexpected incidents.

6.2 Internationalization Requirements

The system shall support multiple languages to cater to users from diverse linguistic backgrounds. Language localization shall be implemented to provide

content in the user's preferred language, enhancing accessibility and usability for a global audience. The platform shall incorporate language selection features to allow users to switch between languages seamlessly.

6.3 Legal Requirements

The system shall comply with relevant laws and regulations governing e-commerce platforms, including data protection laws (e.g., GDPR), consumer rights laws, and taxation regulations. Compliance measures shall include data privacy policies, terms of service agreements, and transparent disclosure of pricing and transaction policies to ensure legal adherence and protect user rights.

6.4 Reuse Objectives

The system shall adhere to modular design principles to facilitate code reuse and maintainability. Common functionalities (e.g., user authentication, product listing) shall be implemented as reusable components to promote efficiency and consistency in development. This approach allows for easier maintenance, updates, and future enhancements, reducing development time and effort while improving code quality and reliability.

Appendices

A Glossary

SRS Software Requirements Specification

API Application Programming Interface

RBAC Role-Based Access Control

MTBF Mean Time Between Failures **GDPR**

General Data Protection Regulation

B To Be Determined List

1. TBD: Detailed design specifications for user authentication module. Thisincludes defining user roles, access control policies, and authentication methods to ensure robust security measures.

2. TBD: External API integration requirements for weather data. This involves identifying suitable weather data providers, specifying data formats and transmission protocols, and implementing data retrieval and processing mechanisms within the system.