Software Requirements Specification

for

RootToRoofOrganics

Version 1.0 approved

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Revision History

Name	Date	Version
RootToRoofOrganics	8 February, 2024	1.0

Software Requirements Specification (SRS) Document

1. Introduction

1.1 Purpose

The purpose of this document is to provide a comprehensive overview of the requirements for the development of an e-commerce web application targeting health enthusiasts. The application will serve as a platform for providing solutions and services related to home-based organic kitchen gardening.

1.2 Document Convention

This Document was created based on the IEEE template for System Requirement Specification Documents.

1.3 Intended Audience and Reading Suggestions

This Software Requirements Specification (SRS) document is intended for individuals involved in the final project development, specifically student developers, project coordinators, and evaluators. Tailored for a student-centric context, developers will find detailed technical insights, while project coordinators and evaluators can utilize the document to assess project scope and progress. To facilitate a comprehensive understanding, readers are advised to familiarize themselves with the overall project vision and adhere to the conventions outlined in this document.

1.4 Product Scope

The scope of the project includes the development of a user-friendly web application that offers organic seeds dispatching, rooftop gardening equipment, terrace-gardening experts, setting up gardening layout based on customer requirements, and soil checking and treatment services.

1.5. References

<To- Be-Added>

2. Overall Description

2.1 Product Perspective

The e-commerce web application operates within the larger context of home-based organic kitchen gardening solutions. It serves as a comprehensive platform, integrating organic seed dispatch, rooftop gardening equipment sales, and specialized services. In this context, it interacts with external systems, such as payment gateways and delivery services, to provide users with a seamless and integrated gardening experience. The application functions independently while complementing and enhancing the overall landscape of health-focused, home gardening solutions.

2.2 Product Functions

Certainly! Let's list and briefly describe the key product functions of the e-commerce web application for home-based organic kitchen gardening:

1. Product Catalogue Display:

• Description: The application provides a user-friendly catalogue showcasing a diverse range of organic seeds and rooftop gardening equipment. Users can easily browse through categories, view detailed product information, and make informed choices for their gardening needs.

2. Shopping Cart and Checkout Process:

 Description: Users can add selected products to their shopping cart and proceed through a secure and intuitive checkout process. The application ensures a seamless transaction experience, incorporating various payment options for user convenience.

3. Terrace-Gardening Expert Consultation:

 Description: The platform offers users the ability to request personalized consultations with terrace-gardening experts. Users can seek advice on plant selection, layout optimization, and receive guidance on maintaining a flourishing organic garden.

4. Gardening Layout Setup:

• Description: Users can request assistance in setting up personalized gardening layouts based on their specific requirements and available space. This service includes expert recommendations on plant placement, spacing, and overall garden design.

5. Soil Checking and Treatment Services:

 Description: The application provides users with the option to request soil checking and treatment services. This includes soil analysis, nutrient assessment, and tailored recommendations for optimizing soil conditions for organic gardening.

6. User Account Management:

Description: Users can create accounts, manage profiles. This feature enhances the overall
user experience by providing a personalized space for managing preferences and accessing
relevant information.

7. Responsive User Interface:

• Description: The application is designed with a responsive and user-friendly interface using React. This ensures a seamless experience across various devices, including desktops, tablets, and smartphones.

These functions collectively contribute to a comprehensive and user-centric platform, addressing the diverse needs of health enthusiasts engaged in home-based organic kitchen gardening.

2.3 User Classes and Characteristics

1. Customers:

 Characteristics: Customers are individuals interested in purchasing organic seeds, rooftop gardening equipment, and availing gardening services. They seek a userfriendly interface for product exploration, secure transactions, and personalized guidance for successful gardening.

2. Terrace-Gardening Experts:

• Characteristics: Experts are experienced individuals in the field of terrace gardening. They engage with users through the platform, offering personalized consultations, layout recommendations, and expertise on plant care. They require a platform for effective communication with customers.

3. Administrators:

Characteristics: Administrators are responsible for overseeing and managing the
overall functionality of the e-commerce platform. They require access to tools for
monitoring user activities, managing product listings, and ensuring the security and
integrity of the system.

4. Developers (Project Team):

 Characteristics: Developers are the project team members responsible for the design, implementation, and maintenance of the web application. They need access to detailed technical documentation, code repositories, and collaboration tools for effective project development.

5. Project Coordinators (Evaluation Team):

• Characteristics: Project coordinators evaluate and oversee the progress of the final project. They require visibility into project timelines, deliverables, and adherence to specified requirements. Access to progress reports and collaboration tools is essential for effective coordination.

2.4 Operating Environment

The e-commerce website is designed to operate seamlessly across various operating systems and web browsers. The compatibility criteria include:

1. **Operating Systems:**

- Windows 7 or above
- Mac OS
- Linux (32-bit or 64-bit architecture)

2. Web Browsers:

- Google Chrome (Latest version)
- Mozilla Firefox (Latest version)
- Microsoft Edge (Latest version)

2.5 Design and Implementation Constraints

The e-commerce web application is crafted using a combination of powerful technologies to ensure a robust and flexible foundation:

Technology Stack:

- **React for Front-End:** The web interface is designed using React, providing a dynamic and responsive user experience. React's component-based architecture simplifies UI development.
- Java-EE (Spring Boot) for Back-End: The business logic and backend operations are implemented using Java-EE with Spring Boot. This framework offers a streamlined development process and facilitates the creation of scalable and maintainable server-side components.

Modular Design:

- Component Modularity: our project adopts a modular approach. Each major feature, whether it's the product catalog, checkout process, or gardening services, is encapsulated within separate modules. This enhances maintainability and allows for independent development and testing.
- **API Integration:** Modules communicate through well-defined APIs, ensuring seamless interaction. This modular design not only facilitates collaborative development but also enables the addition of new features or enhancements without disrupting the existing system.

User-Centric Approach:

- Responsive Design: our project prioritizes a responsive design using React. This ensures a seamless user experience across various devices, catering to the diverse needs of health enthusiasts.
- Accessibility Focus: The design incorporates considerations for user accessibility standards, enhancing the inclusivity of the application. This user-centric approach aligns with the project's objective of providing an intuitive and accommodating platform.

2.6 Assumptions and Dependencies

Assumptions:

1. Third-Party Services:

 Assumption: Stability and availability of third-party services (payment gateways, delivery services) are assumed. Disruptions may impact platform functionality.

2. User Internet Connectivity:

• Assumption: Users are assumed to have stable internet access. Inconsistent connectivity may affect user experience and transactions.

3. Regulatory Compliance:

• Assumption: Adherence to legal and regulatory requirements is assumed. Changes may necessitate system adjustments.

4. Gardening Expert Availability:

• Assumption: Availability of terrace-gardening experts is assumed for consultation services. Lack of experts may impact service delivery.

Dependencies:

1. External APIs:

• Dependency: The project relies on external APIs (payment processing, delivery tracking). Changes or unavailability may affect corresponding features.

2. React and Java-EE (Spring Boot) Updates:

• Dependency: Project depends on updates and stability of React and Java-EE (Spring Boot). Major changes may require codebase adjustments.

3. Database Management System:

• Dependency: Project is dependent on stability and compatibility of MySQL. Changes in the database system may impact data functionalities.

4. Security Frameworks:

• Dependency: Project relies on security frameworks. Changes in security standards may necessitate application updates.

3. External Interface Requirements

3.1 User Interfaces

Logical Characteristics:

1. Home Page:

- Description: The home page serves as the entry point, providing an overview of products, services, and expert consultations.
- Characteristics: Visual appeal, intuitive navigation, and quick access to key sections.

2. Product Catalogue:

- Description: Interface for browsing and exploring organic seeds, gardening equipment, and related products.
- Characteristics: Filter options, search functionality, detailed product pages with images and pricing.

3. Consultation Request Interface:

- Description: Dedicated space for users to request consultations with terrace-gardening experts.
- Characteristics: Booking details, expert profiles, and preferred time slots.

4. Gardening Layout Setup:

- Description: Interface for users to communicate gardening preferences and visualize personalized layouts.
- Characteristics: Interactive tools, customization options, and collaborative design features.

5. Order Management:

- Description: User-friendly cart interface for managing selected items and tracking orders.
- Characteristics: Shopping cart functionality, real-time order tracking, and order history.

6. User Account Dashboard:

Description: Dashboard for profile management, order history, and communication.

• Characteristics: Notification hub, personalized settings, and user-friendly interface.

7. Responsive Design:

- Description: Ensuring the user interfaces are responsive across various devices and browsers.
- Characteristics: Cross-device compatibility and adherence to browser standards.

3.2 Hardware Interfaces

Logical and Physical Characteristics:

1. Supported Device Types:

- Description: The software is designed to support various devices, including desktops, tablets, and smartphones.
- Characteristics: Cross-device compatibility and responsive design.

3.3 Software Interfaces

Connections with Other Software Components:

1. React and Java-EE (Spring Boot):

- Description: Interaction with the chosen technologies for front-end (React) and backend (Java-EE with Spring Boot).
- Characteristics: API usage, module interactions, and seamless communication between front-end and back-end components.

2. MySQL Database:

- Description: Connection with the MySQL database for data storage and retrieval.
- Characteristics: Database queries, data transactions, and adherence to database management system standards.

3.4 Communications Interfaces

Requirements for Communications Functions:

1. API Communication:

- Description: Communication with external APIs for payment processing, delivery tracking, and other third-party services.
- Characteristics: API protocols, data exchange formats, and secure communication standards.

2. Security and Encryption:

- Description: Secure communication channels for user data, including encryption standards.
- Characteristics: Implementation of secure communication protocols and adherence to encryption requirements.

2.1 System Description

The system will consist of a React-based front-end for the user interface, a Java-EE (Spring Boot) based back-end for business logic, and MySQL for database handling and management. The web application will cater specifically to health enthusiasts interested in home-based organic kitchen gardening.

4. System Features

4.1 Product Catalog Management

4.1.1 Description and Priority

- **Description:** Admins can add, edit, and remove products from the catalog. Each product includes details like name, description, images, and pricing.
- **Priority:** High

4.1.2 Stimulus/Response Sequences

- User Adds Product to Catalog:
 - User action: Admin clicks "Add Product."
 - System response: Displays form for product details entry.
- User Edits Product Information:
 - User action: Admin selects a product for editing.
 - System response: Loads product details for editing.

4.1.3 Functional Requirements

- **REQ-1:** The system shall provide a form for admins to input product details, including name, description, images, and pricing.
- **REQ-2:** The system shall validate and store the entered product information in the database.
- **REQ-3:** The system shall allow admins to edit existing product information.
- **REQ-4:** The system shall ensure that only authorized admins can add, edit, or remove products.
- REQ-5: The system shall display appropriate error messages for invalid inputs or unauthorized actions.

4.2 User Account Management

4.2.1 Description and Priority

- **Description:** Users can create accounts, manage profiles, and track order history. Admins can access and manage user accounts for support purposes.
- **Priority:** High

4.2.2 Stimulus/Response Sequences

• User Creates an Account:

- User action: Clicks "Sign Up" and enters required information.
- System response: Validates information and creates a new user account.
- User Updates Profile:
 - User action: Edits profile details.
 - System response: Updates the user profile in the database.

4.2.3 Functional Requirements

- **REQ-1:** The system shall provide a user registration form with necessary fields.
- **REQ-2:** The system shall authenticate users during the login process.
- **REQ-3:** The system shall allow users to update their profile information.
- **REQ-4:** The system shall store and retrieve user account information securely.
- **REQ-5:** Admins shall have the capability to view and manage user accounts for customer support.

4.3 Shopping Cart and Checkout Process

4.3.1 Description and Priority

- **Description:** Users can add products to a shopping cart, review items, and proceed through a secure checkout process, including multiple payment options.
- Priority: High

4.3.2 Stimulus/Response Sequences

- User Adds Product to Cart:
 - User action: Clicks "Add to Cart."
 - System response: Updates the shopping cart with the selected product.
- User Proceeds to Checkout:
 - User action: Clicks "Checkout."
 - System response: Initiates the secure checkout process.

4.3.3 Functional Requirements

- **REQ-1:** The system shall maintain a user-specific shopping cart.
- **REQ-2:** Users shall have the option to review and modify the cart before checkout.
- **REQ-3:** The system shall support multiple payment options, including credit cards and digital wallets.
- **REQ-4:** User payment information shall be securely processed and stored.
- REQ-5: The system shall generate and display order confirmation upon successful payment.

4.4 Consultation Services Booking

4.4.1 Description and Priority

- **Description:** Users can request consultations with terrace-gardening experts. Admins can manage and schedule consultations.
- **Priority:** Medium

4.4.2 Stimulus/Response Sequences

- User Requests Consultation:
 - User action: Selects "Request Consultation."
 - System response: Prompts user to provide details and schedule.
- Admin Schedules Consultation:
 - Admin action: Accesses consultation requests.
 - System response: Allows admin to schedule consultations and notify users.

4.4.3 Functional Requirements

- **REQ-1:** The system shall provide a form for users to request consultations, specifying preferences and availability.
- **REQ-2:** Admins shall receive and manage consultation requests through an admin interface.
- **REQ-3:** Admins shall have the ability to schedule and confirm consultations.
- **REQ-4:** Users shall receive notifications and reminders for scheduled consultations.

4.5 Gardening Layout Setup

4.5.1 Description and Priority

- **Description:** Users can communicate their gardening preferences, and experts provide personalized gardening layout recommendations.
- **Priority:** Medium

4.5.2 Stimulus/Response Sequences

- User Communicates Preferences:
 - User action: Fills out gardening preferences form.
 - System response: Transmits preferences to the expert.
- Expert Proposes Layout:
 - Expert action: Creates a personalized gardening layout.
 - System response: Displays the proposed layout to the user.

4.5.3 Functional Requirements

- **REQ-1:** The system shall provide a user-friendly interface for users to communicate gardening preferences.
- **REQ-2:** Experts shall have tools to create and visualize personalized gardening layouts.
- **REQ-3:** Users shall be able to review and provide feedback on proposed layouts.

• **REQ-4:** The system shall support iterative communication between users and experts for refining layouts.

4.6 Order Tracking and Notifications

4.6.1 Description and Priority

- **Description:** Users receive real-time updates on their orders, including confirmation, shipping, and delivery notifications.
- **Priority:** High

4.6.2 Stimulus/Response Sequences

- User Places an Order:
 - User action: Completes the checkout process.
 - System response: Generates an order confirmation with tracking information.
- User Receives Delivery Confirmation:
 - System action: Updates delivery status.
 - User response: Receives notifications confirming order delivery.

4.6.3 Functional Requirements

- **REQ-1:** The system shall generate order confirmations with unique tracking identifiers.
- **REQ-2:** Users shall receive real-time updates on the status of their orders.
- **REQ-3:** The system shall trigger notifications for order shipping and delivery.
- **REQ-4:** Users shall have the ability to opt-in or opt-out of specific notification types.

4.7 Responsive User Interface

4.7.1 Description and Priority

- **Description:** The user interface is designed using React, ensuring responsiveness across various devices and browsers.
- Priority: High

4.7.2 Stimulus/Response Sequences

- User Accesses Platform from Different Devices:
 - User action: Accesses the platform from a desktop, tablet, or smartphone.
 - System response: Adjusts the interface layout for optimal viewing on the specific device.

4.7.3 Functional Requirements

- **REQ-1:** The user interface shall be developed using React for seamless cross-device compatibility.
- **REQ-2:** The system shall adapt interface elements based on the user's device screen size and resolution.

 REQ-3: Users shall experience consistent and optimized interactions regardless of the device used.

4.8 Security and Authentication

4.8.1 Description and Priority

- **Description:** Secure user authentication and data encryption to protect user information and ensure data integrity.
- **Priority:** High

4.8.2 Stimulus/Response Sequences

- User Logs In:
 - User action: Enters credentials and clicks "Log In."
 - System response: Validates credentials and grants access.
- System Detects Suspicious Activity:
 - System action: Detects multiple failed login attempts.
 - User response: Triggers account lockout and notifies the user.

4.8.3 Functional Requirements

- **REQ-1:** The system shall implement secure user authentication protocols.
- **REQ-2:** User passwords shall be securely stored using encryption algorithms.
- **REQ-3:** The system shall monitor and respond to suspicious login activities.
- **REQ-4:** Admins shall have tools to manage user authentication settings and account permissions.

4.9 Database Management

4.9.1 Description and Priority

- **Description:** Integration with MySQL for efficient data storage and retrieval, ensuring reliability and scalability.
- Priority: High

4.9.2 Stimulus/Response Sequences

- User Places an Order:
 - User action: Completes the checkout process.
 - System response: Stores order details in the MySQL database.
- Admin Retrieves User Information:
 - Admin action: Accesses user profiles for support.
 - System response: Retrieves user information from the MySQL database.

4.9.3 Functional Requirements

- **REQ-1:** The system shall establish a secure connection with the MySQL database for data storage.
- **REQ-2:** The database shall be optimized for efficient retrieval of user-related information.
- **REQ-3:** Admins shall have the ability to perform CRUD operations on user data.
- **REQ-4:** The system shall implement backup and recovery procedures to ensure data integrity.

4.10 Expert Profiles and Management

4.10.1 Description and Priority

- **Description:** Admins can manage terrace-gardening expert profiles, including expertise areas, availability, and user reviews.
- **Priority:** Medium

4.10.2 Stimulus/Response Sequences

- Admin Edits Expert Profile:
 - Admin action: Modifies expert details.
 - System response: Updates expert information in the database.
- User Views Expert Profile:
 - User action: Accesses an expert's profile.
 - System response: Retrieves and displays expert details.

4.10.3 Functional Requirements

- **REQ-1:** Admins shall have tools to add, edit, and remove terrace-gardening expert profiles.
- **REQ-2:** Expert profiles shall include information on expertise, availability, and user ratings.
- **REQ-3:** Users shall be able to view and review expert profiles.
- **REQ-4:** Admins shall receive notifications for new expert registrations and user reviews.

4.11 Feedback and Ratings

4.11.1 Description and Priority

- **Description:** Users can provide feedback and ratings for products and services, contributing to a dynamic feedback loop.
- **Priority:** Medium

4.11.2 Stimulus/Response Sequences

- User Submits Product Review:
 - User action: Writes a product review.
 - System response: Stores the review in the database and updates product ratings.
- Admin Monitors Feedback:
 - Admin action: Accesses feedback and ratings dashboard.

System response: Displays aggregated feedback and ratings data.

4.11.3 Functional Requirements

- REQ-1: The system shall provide a user-friendly interface for submitting feedback and ratings.
- **REQ-2:** User reviews shall be stored in the database, associating them with respective products or services.
- **REQ-3:** Admins shall have access to tools for monitoring and analyzing feedback trends.
- **REQ-4:** Users shall receive acknowledgment or follow-up notifications based on their feedback.

4.12 Search and Filter Functionality

4.12.1 Description and Priority

- **Description:** Users can easily search for products and services using filters, enhancing the browsing experience.
- Priority: High

4.12.2 Stimulus/Response Sequences

- User Searches for Organic Seeds:
 - User action: Types "organic seeds" in the search bar.
 - System response: Displays relevant product results based on the search query.
- User Applies Filters for Rooftop Gardening Equipment:
 - User action: Selects filters for "rooftop gardening" and "equipment."
 - System response: Filters and displays products matching the selected criteria.

4.12.3 Functional Requirements

- **REQ-1:** The system shall provide a search bar for users to input keywords.
- **REQ-2:** Filters shall be available for users to narrow down product or service categories.
- **REQ-3:** Search results and filtered displays shall update dynamically without requiring page reloads.
- **REQ-4:** The system shall prioritize and display relevant results based on user search history and preferences.

4.13 Seasonal Promotions and Discounts

4.13.1 Description and Priority

- **Description:** Admins can create and manage seasonal promotions, discounts, and special offers to incentivize purchases.
- **Priority:** Medium

4.13.2 Stimulus/Response Sequences

• Admin Launches Holiday Sale:

- Admin action: Sets up a special promotion for the holiday season.
- System response: Displays banners and promotes discounted products during the specified period.
- User Applies a Discount Code:
 - User action: Enters a promotional code during checkout.
 - System response: Applies the relevant discount to the order total.

4.13.3 Functional Requirements

- REQ-1: Admins shall have tools to create, edit, and remove promotional events.
- REQ-2: Users shall have access to promotional details and eligible discounts.
- REQ-3: The system shall apply discounts automatically or through user-entered codes.
- REQ-4: Admins shall receive reports on the effectiveness of promotional campaigns.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- **Response Time:** The system should respond within 3 seconds for user interactions.
- **Concurrent Users:** Support a minimum of 500 concurrent users during peak hours.
- **Transaction Throughput:** Handle a minimum of 100 transactions per minute during peak usage.

5.2 Safety Requirements

- **Data Encryption:** Encrypt all user-sensitive data during transmission and storage.
- **Order Verification:** Implement order verification mechanisms to prevent fraudulent activities.

5.3 Security Requirements

- **User Authentication:** Users must authenticate using secure methods.
- **Secure APIs:** APIs for communication shall be secured using encryption.
- **Regular Security Audits:** Conduct security audits and vulnerability assessments quarterly.

5.4 Software Quality Attributes

- **Usability:** Achieve a System Usability Scale (SUS) score of at least 75.
- **Reliability:** Maintain an uptime of 99.9%.
- Maintainability: Codebase should be well-documented, and updates should deploy with minimal downtime.

5.5 Business Rules

- **User Roles:** Only registered and authenticated users can place orders.
- **Order Cancellation Window:** Users can cancel orders within 24 hours of placing them.

6. Other Requirements

• 6.1 Database Requirements:

- *Requirement:* The system shall utilize MySQL for database management.
- Rationale: MySQL provides a reliable and scalable solution for data storage.

• 6.2 Internationalization Requirements:

- *Requirement:* The system shall support multiple languages to cater to a diverse user base.
- *Rationale*: Ensures accessibility and inclusivity for users globally.

• 6.3 Legal Compliance:

- *Requirement:* The system shall adhere to relevant data protection and privacy regulations.
- Rationale: Ensures legal compliance and user data protection.

• 6.4 Reuse Objectives:

- Requirement: Codebase should follow modular design principles for ease of reuse.
- *Rationale:* Facilitates future development and enhances code maintainability.

Appendix A: Glossary

- **API:** Application Programming Interface
- CMS: Content Management System
- **SUS:** System Usability Scale
- **TBD:** To Be Determined

Appendix B: Analysis Models

- *Data Flow Diagram:* Illustrates the flow of data within the system, depicting inputs, processes, and outputs.
- *Class Diagram:* Represents the structure of classes and their relationships in the system.
- Entity-Relationship Diagram: Illustrates the entities and their relationships in the database.

Appendix C: To Be Determined List

- 1. **TBD:** Payment gateway integration details.
- 2. **TBD:** Specific requirements for mobile responsiveness.
- 3. **TBD:** User feedback and rating display format.
- 4. **TBD:** Backup and recovery procedures for the database.