Milk E-commerce Project

Software Requirements Specification

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## 1. Introduction

*The Milk E-commerce project aims to provide an online platform for customers to purchase milk products and related goods, and for sellers to manage their inventory and sales. It also allows admins to oversee the entire platform.*

### 1.1 Purpose

### *The purpose of this Software Requirements Specification (SRS) is to outline the functional and non-functional requirements for the Milk E-commerce website. This document will serve as a guide for developers, testers, and stakeholders throughout the development process.*

### 1.2 Scope

The scope of this project encompasses the development and testing of the features described in this SRS. It includes:

* Functional testing of all user roles (Customer, Seller, Admin).
* Compatibility with modern web browsers.
* Integration with external payment gateways and shipping carriers.

The following are out of scope:

* Non-functional testing (stress, performance).
* Automation testing.

### 1.3 Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| **Abbreviation** | **Word** |
| C | Customer |
| S | Seller |
| A | Admin |

**2. Specific Requirements**

The Milk E-commerce site will have three user roles:

* **Customer:** Browse and purchase products, manage their account, and write reviews.
* **Seller:** Manage inventory, process orders, view sales reports, and respond to reviews.
* **Admin:** Manage users, products, categories, and view site analytics.

Following features/modules will be available to these 3 different roles:

|  |  |  |
| --- | --- | --- |
| **Customer** | **Seller** | **Admin** |
| Browse Products | Manage Inventory | Manage Users |
| Add to Cart | Process Orders | Manage Products |
| Checkout | Manage Reviews | Manage Categories |
| View Order History | View Sales Reports | View Site Analytics |
| Write Reviews |  |  |
| Manage Account |  |  |

**Description of the modules**

|  |  |  |
| --- | --- | --- |
| **Module Name (SR#)** | **Applicable Roles** | **Description** |
| Browse Products | C | **Customers** can search and filter products by category, brand, price, etc. |
| Add to Cart | C | **Customers** can add products to their shopping cart. |
| Checkout | C | **Customers** can complete their purchase by providing shipping and payment information. |
| View Order History | C | **Customers** can view their past orders and track their current orders. |
| Write Reviews | C | **Customers** can write reviews for products they have purchased. |
| Manage Account | C | **Customers** can update their personal information, change their password, and view their order history. |
| Manage Inventory | S | **Sellers** can add, update, and delete products from their inventory. |
| Process Orders | S | **Sellers** can view and process new orders, update order status, and generate shipping labels. |
| Manage Reviews | S | **Sellers** can view and respond to customer reviews. |
| View Sales Reports | S | **Sellers** can view their sales data, including revenue, units sold, and top-selling products. |
| Manage Users | A | **Admins** can add, update, and delete user accounts (customers and sellers). |
| Manage Products | A | **Admins** can add, update, and delete products from the entire site. |
| Manage Categories | A | **Admins** can add, update, and delete product categories. |
| View Site Analytics | A | **Admins** can view site traffic data, conversion rates, and other key metrics. |

**2.1 External Interface Requirements**

**2.1.1 User Interfaces**

 Web browser interface for customers, sellers, and admins.

 Mobile responsive design for optimal viewing on different devices.

 Clear and intuitive navigation for easy browsing and product discovery.

 User-friendly forms for registration, login, checkout, and account management.

 Interactive elements like product carousels, image zoom, and customer views.

**2.1.2 Hardware Interfaces**

 The system will primarily be accessed through standard computer hardware (desktops, laptops) and mobile devices (smartphones, tablets).

 No specialized hardware interfaces are required.

**2.1.3 Software Interfaces**

 **Email Notifications:**

* Order confirmations, shipping updates, and delivery notifications for customers.
* New order notifications and customer inquiries for sellers.
* System alerts and reports for admins.

 **SMS Notifications (Optional):**

* Order updates and promotional messages for customers.

 **Live Chat (Optional):**

* Real-time chat support for customers and sellers.

**2.1.4 Communications Interfaces**

 **Email Notifications:**

* Order confirmations, shipping updates, and delivery notifications for customers.
* New order notifications and customer inquiries for sellers.
* System alerts and reports for admins.

 **SMS Notifications (Optional):**

* Order updates and promotional messages for customers.

 **Live Chat (Optional):**

* Real-time chat support for customers and sellers.

**3.1 Front End Details**

This section describes the Front end of the E-commerce site. It also lists a few use cases to describe the functioning of the system. Following is a list of module-wise fields:

#### Product Details Page (Customer View)

* **Product Image:** High-resolution images with zoom functionality.
* **Product Name:** Clear and descriptive product name.
* **Product Description:** Detailed information about the product, including ingredients, nutritional value, and usage instructions.
* **Price:** Clearly displayed price, including any discounts or promotions.
* **Category:** The product category (e.g., milk, formula, yogurt).
* **Brand:** The product brand.
* **Available Sizes/Colors:** Dropdown or list of available options.
* **Quantity Selector:** Input field or buttons to select the desired quantity.
* **Add to Cart Button:** Prominent button to add the product to the shopping cart.
* **Reviews Section:** Display of customer reviews and ratings, with sorting and filtering options.
* **Seller Information:** Seller name, rating, and contact information.

#### Product Listing Page (Customer View)

* **Search Bar:** Prominent search bar with autocomplete and filtering options (by category, brand, price, etc.).
* **Product Grid/List:** Display of products in a grid or list format.
* **Product Images:** Thumbnail images of products.
* **Product Names:** Clear and concise product names.
* **Prices:** Clearly displayed prices.
* **Ratings:** Star ratings or numerical scores.
* **"Add to Cart" Buttons:** Easily accessible buttons to add products to the cart.
* **Sorting Options:** Sorting by price, rating, popularity, etc.
* **Pagination:** Navigation to different pages of product listings.

#### Shopping Cart Page (Customer View)

* **Product Summary:** List of products in the cart with images, names, prices, quantities, and subtotal.
* **Quantity Update:** Option to update the quantity of each product.
* **Remove Item:** Option to remove items from the cart.
* **Coupon Code Field:** Input field for applying coupon codes.
* **Shipping Options:** Display of available shipping methods and costs.
* **Order Summary:** Total cost including product prices, taxes, and shipping.
* **"Proceed to Checkout" Button:** Prominent button to initiate the checkout process.

#### Checkout Page (Customer View)

* **Shipping Address Form:** Fields for entering shipping address details (name, address, city, state, ZIP code).
* **Billing Address Form:** Fields for entering billing address details (optional if the same as shipping address).
* **Payment Method Selection:** Options for selecting payment methods (credit/debit card, PayPal, etc.).
* **Order Summary:** Final review of the order details before placing the order.
* **"Place Order" Button:** Button to confirm and place the order.

#### Order History Page (Customer View)

* **Order List:** List of past orders with order number, date, status, and total amount.
* **Order Details:** Detailed view of each order, including items, shipping, billing, and payment information.
* **Track Order:** Link or button to track the shipping status of an order.
* **Cancel Order (Optional):** Option to cancel an order if it hasn't been shipped yet.

#### Review Submission Form (Customer View)

* **Rating:** Star rating system (1-5 stars) or numerical rating.
* **Review Title:** Input field for a short review title.
* **Review Text:** Text area for writing the review.
* **"Submit Review" Button:** Button to submit the review.

#### Account Management Page (Customer View)

* **Personal Information:** Fields for managing personal information (name, email, address, phone number).
* **Change Password Form:** Form for changing the account password.
* **Order History:** Link to the order history page.
* **Saved Addresses:** List of saved addresses for shipping and billing.
* **Payment Methods:** List of saved payment methods.

**3.2 Technical Requirements (TRD)**

**Product Details Page (Customer View)**

* T1: Product Image - Image should be in a supported format (JPEG, PNG, GIF).
* T2: Product Name - Must not be blank.
* T3: Product Description - Must not be blank.
* T4: Price - Must be a positive number.
* T5: Category - Must be selected from a predefined list.
* T6: Brand - Must be selected from a predefined list or entered as new.
* T7: Available Sizes/Colors - At least one size/color must be selected.
* T8: Quantity Selector - Must allow selection of positive integers.
* T9: Add to Cart Button - Should add the correct product and quantity to the cart.
* T10: Reviews Section - Should display existing reviews and allow sorting/filtering.
* T11: Seller Information - Should display seller name and rating.

**Product Listing Page (Customer View)**

* T12: Search Bar - Should allow text input and filter results in real-time.
* T13: Filters - Should function correctly based on selected criteria.
* T14: Sorting Options - Should allow sorting by price, rating, etc.
* T15: Pagination - Should display the correct number of products per page and allow navigation.

**Shopping Cart Page (Customer View)**

* T16: Quantity Update - Should update subtotal and total accurately.
* T17: Remove Item - Should remove the item from the cart and update totals.
* T18: Apply Coupon Code - Should validate and apply valid coupon codes.
* T19: Proceed to Checkout Button - Should redirect to the checkout page.

**Checkout Page (Customer View)**

* T20: Shipping Address Form - All fields (name, address, city, state, ZIP) are required and should be validated.
* T21: Billing Address Form - Same as T20, with the option to use the shipping address.
* T22: Payment Method Selection - At least one payment method must be selected.
* T23: Order Summary - Should accurately reflect items, quantities, and totals.
* T24: Place Order Button - Should process the order and redirect to a confirmation page.

**Order History Page (Customer View)**

* T25: Order Details - Should display all relevant order information (items, shipping, billing, payment).
* T26: Track Order - Should provide a link to track the shipping status of the order.
* T27: Cancel Order - Should allow canceling an order if it hasn't been shipped yet.

**Review Submission Form (Customer View)**

* T28: Rating - Must be selected (1-5 stars).
* T29: Review Title - Must not be blank.
* T30: Review Text - Must not be blank.
* T31: Submit Review Button - Should submit the review and display a confirmation message.

**Account Management Page (Customer View)**

* T32: Personal Information - All fields should allow updates and validate input (e.g., email format).
* T33: Change Password Form - Should enforce password strength rules and require confirmation.
* T34: Order History - Should display a list of past orders with relevant details.
* T35: Saved Addresses - Should allow adding, editing, and deleting addresses.
* T36: Payment Methods - Should allow adding, editing, and deleting payment methods.

**Add/Edit Product Page (Seller View)**

* T37: Product Name - Must not be blank.
* T38: Product Description - Must not be blank.
* T39: Price - Must be a positive number.
* T40: Category - Must be selected from a predefined list.
* T41: Brand - Must be selected from a predefined list or entered as new.
* T42: Images - At least one image must be uploaded and should be in a supported format.
* T43: Inventory - Must be a non-negative integer.
* T44: SKU - Must be unique.
* T45: Shipping Options - Should allow selecting various shipping methods and setting costs.

**Order Management Page (Seller View)**

* T46: Order Search/Filter - Should allow searching and filtering orders by ID, date, customer, or status.
* T47: Update Status - Should allow changing order status to valid options (e.g., processing, shipped, delivered).
* T48: Generate Shipping Label - Should generate a shipping label for the selected carrier.
* T49: View Order Details - Should display all relevant order information.

**Sales Report Page (Seller View)**

* T50: Date Range Selector - Should allow selecting valid date ranges.
* T51: Report Generation - Should generate accurate reports based on selected dates and display them in a clear format (table, chart, etc.).
* T52: Export Report - Should allow exporting the report in various formats (CSV, PDF, etc.).

**User Management Page (Admin View)**

* T53: User Search/Filter - Should allow searching and filtering users by ID, type, name, email, or status.
* T54: Edit User - Should allow updating user information and validate input.
* T55: Delete User - Should require confirmation before deleting.
* T56: User Roles - Should allow assigning or changing user roles (admin, seller, customer).

**Product Management Page (Admin View)**

* T57: Product Search/Filter - Should allow searching and filtering products by ID, name, seller, price, category, or status.
* T58: Edit Product - Should allow updating product information and validate input.
* T59: Delete Product - Should require confirmation before deleting.
* T60: Approve/Reject Product - Should allow admins to approve or reject products submitted by sellers.

**Category Management Page (Admin View)**

* T61: Add Category - Should allow creating new categories and subcategories.
* T62: Edit Category - Should allow updating category names and descriptions.
* T63: Delete Category - Should require confirmation before deleting and handle subcategories appropriately.

**Site Analytics Dashboard (Admin View)**

* T64: Data Refresh - Should allow refreshing data to get the latest information.
* T65: Data Filtering - Should allow filtering data by date range or other relevant criteria.
* T66: Customizable Widgets - Should allow admins to choose which widgets to display and customize their layout.
* T67: Export Data - Should allow exporting data in various formats (CSV, PDF, etc.).

**3.3 Functional Validations (BRD)**

(This section would include detailed functional validations for each module, ensuring that the system behaves as expected under different scenarios.)

**3.4 Classes / Objects**

 **Product:**

* Attributes: ID, name, description, price, category, brand, images, inventory, SKU, shipping options.
* Methods: getDetails(), addToCart(), updateInventory(), calculateShipping().

 **Customer:**

* Attributes: ID, name, email, address, phone number, password, order history, saved addresses, payment methods.
* Methods: register(), login(), updateProfile(), placeOrder(), writeReview().

 **Seller:**

* Attributes: ID, name, email, address, phone number, password, products, sales reports.
* Methods: addProduct(), updateProduct(), deleteProduct(), processOrder(), viewSalesReport().

 **Admin:**

* Attributes: ID, name, email, password.
* Methods: manageUsers(), manageProducts(), manageCategories(), viewSiteAnalytics().

 **Order:**

* Attributes: ID, customer, products, quantities, total amount, shipping address, billing address, payment method, status, date.
* Methods: calculateTotal(), updateStatus(), generateInvoice().

 **Review:**

* Attributes: ID, customer, product, rating, title, text, date.
* Methods: getRating(), displayReview().

**3.5 Non-Functional Requirements**

 **Performance:**

* The site should load pages within 3 seconds.
* The checkout process should be completed within 1 minute.

 **Security:**

* User data should be encrypted and protected from unauthorized access.
* Payment transactions should be secure and compliant with industry standards.

 **Usability:**

* The site should be intuitive and easy to navigate for all user roles.
* Clear instructions and error messages should be provided.

 **Reliability:**

* The site should be available 99.9% of the time.
* Errors should be logged and monitored.

 **Scalability:**

* The system should be able to handle increased traffic and transactions as the business grows.

**3.6 Inverse Requirements**

 The site will not support in-person purchases or pickups.

 The site will not offer subscriptions or recurring orders initially.

 The site will not have a dedicated mobile app at launch.

**3.7 Design Constraints**

 The site's design should be visually appealing, modern, and consistent with the brand's identity.

 The site should be accessible to users with disabilities, following WCAG guidelines.

 The site should be optimized for mobile devices, providing a seamless experience on smaller screens.

**3.8 Logical Database Requirements**

|  |  |
| --- | --- |
| Table Name | Fields |
| Users | ID (Primary Key), User Type (Customer/Seller/Admin), Name, Email, Password (hashed), Address, Phone Number, Status (Active/Inactive), Registration Date, Last Login Date |
| Products | ID (Primary Key), Name, Description, Price, Category ID (Foreign Key), Brand ID (Foreign Key), Seller ID (Foreign Key), SKU, Stock Quantity, Status (Active/Inactive), Created Date, Last Updated Date |
| Categories | ID (Primary Key), Name, Parent Category ID (Foreign Key), Description |
| Brands | ID (Primary Key), Name, Description |
| Orders | ID (Primary Key), Customer ID (Foreign Key), Order Date, Shipping Address, Billing Address, Payment Method, Total Amount, Status (Pending/Processing/Shipped/Delivered/Cancelled), Tracking Number |
| Order Items | ID (Primary Key), Order ID (Foreign Key), Product ID (Foreign Key), Quantity, Price |
| Reviews | ID (Primary Key), Customer ID (Foreign Key), Product ID (Foreign Key), Rating, Title, Text, Date |
| Payments | ID (Primary Key), Order ID (Foreign Key), Payment Method, Amount, Transaction ID, Status (Success/Failed), Date |
| Shipping | ID (Primary Key), Order ID (Foreign Key), Shipping Carrier, Tracking Number, Shipping Cost, Shipping Date, Delivery Date |
| Coupons | ID (Primary Key), Code, Discount Type (Percentage/Fixed Amount), Discount Value, Start Date, End Date, Minimum Order Amount, Usage Limit |
| Wishlists | ID (Primary Key), Customer ID (Foreign Key), Product ID (Foreign Key) |
| Carts | ID (Primary Key), Customer ID (Foreign Key) |
| Cart Items | ID (Primary Key), Cart ID (Foreign Key), Product ID (Foreign Key), Quantity |

**3.9 Other Requirements**

 **Search Engine Optimization (SEO):** Implement SEO best practices to improve the website's visibility in search engine results.

 **Analytics Integration:** Integrate with analytics tools (e.g., Google Analytics) to track website traffic, user behavior, and sales data.

 **Customer Support:** Provide clear channels for customer support (e.g., email, phone, live chat).

 **Content Management System (CMS):** Implement a CMS for easy management of product descriptions, blog posts, and other website content.

**4. Analysis Models**

 **Use Case Diagrams:** Illustrate the interactions between actors (Customer, Seller, Admin) and the system's functionalities.

 **Activity Diagrams:** Depict the flow of activities within the system for various processes (e.g., checkout, order fulfillment).

 **Sequence Diagrams:** Show the sequence of messages exchanged between objects in the system for specific scenarios.

**5. Change Management Process**

 All changes to the SRS must be documented and approved by the project manager and relevant stakeholders.

 A change request form will be used to track and manage proposed changes.

 Changes will be reviewed for impact on the project timeline, budget, and resources.

 Approved changes will be implemented and documented in updated versions of the SRS.

**A. Appendices**

 **Wireframes:** Visual representations of the website's layout and user interface elements.

 **Mockups:** High-fidelity designs of the website's appearance.

 **Data Flow Diagrams:** Diagrams illustrating the flow of data within the system.

 **Entity-Relationship Diagrams (ERD):** Diagrams showing the relationships between entities in the database.