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)**

**Browse Products**

* T01 - Filtering Products - Correct
* T02 - Filtering Products - Incorrect
* T03 - Searching Products - Correct
* T04 - Searching Products - Incorrect
* T05 - Sorting Products - Correct
* T06 - Sorting Products – Incorrect

**Add to Cart**

* T07 - Adding Multiple Quantities - Correct
* T08 - Adding Multiple Quantities - Incorrect
* T09 - Viewing Cart Contents - Correct
* T10 - Viewing Cart Contents - Incorrect
* T11 - Removing Items - Correct
* T12 - Removing Items - Incorrect

**Checkout**

* T13 - Entering Shipping Information - Correct
* T14 - Entering Shipping Information - Incorrect
* T15 - Choosing Preferred Payment Method - Correct
* T16 - Choosing Preferred Payment Method - Incorrect
* T17 - Reviewing Order Details - Correct
* T18 - Reviewing Order Details - Incorrect

**View Order History**

* T19 - Viewing List - Correct
* T20 - Viewing List - Incorrect
* T21 - Checking Status - Correct
* T22 - Checking Status - Incorrect
* T23 - Viewing Details - Correct
* T24 - Viewing Details - Incorrect

**Write Reviews**

* T25 - Rating Products Purchased - Correct
* T26 - Rating Products Purchased - Incorrect
* T27 - Writing Detailed Reviews - Correct
* T28 - Writing Detailed Reviews - Incorrect
* T29 - Editing or Deleting Reviews - Correct
* T30 - Editing or Deleting Reviews - Incorrect

**Manage Account**

* T31 - Updating Personal Information - Correct
* T32 - Updating Personal Information - Incorrect
* T33 - Changing Password - Correct
* T34 - Changing Password - Incorrect
* T35 - Managing Saved Payment Methods - Correct
* T36 - Managing Saved Payment Methods - Incorrect

**Manage Inventory**

* T37 - Updating Stock Levels - Correct
* T38 - Updating Stock Levels - Incorrect
* T39 - Adding New Products - Correct
* T40 - Adding New Products - Incorrect
* T41 - Marking Products - Correct
* T42 - Marking Products - Incorrect

**Process Orders**

* T43 - Viewing New Orders - Correct
* T44 - Viewing New Orders - Incorrect
* T45 - Updating Order Status - Correct
* T46 - Updating Order Status - Incorrect
* T47 - Generating Packing Slips - Correct
* T48 - Generating Packing Slips - Incorrect

**Manage Reviews**

* T49 - Approving or Rejecting Customer Reviews - Correct
* T50 - Approving or Rejecting Customer Reviews - Incorrect
* T51 - Responding to Customer Reviews - Correct
* T52 - Responding to Customer Reviews - Incorrect
* T53 - Reporting Inappropriate Reviews - Correct
* T54 - Reporting Inappropriate Reviews - Incorrect

**View Sales Reports**

* T55 - Generating Sales Reports - Correct
* T56 - Generating Sales Reports - Incorrect
* T57 - Viewing Breakdown of Sales - Correct
* T58 - Viewing Breakdown of Sales - Incorrect
* T59 - Exporting Sales Reports - Correct
* T60 - Exporting Sales Reports – Incorrect

**Manage Users**

* T61 - Creating New User Accounts - Correct
* T62 - Creating New User Accounts - Incorrect
* T63 - Assigning Roles - Correct
* T64 - Assigning Roles - Incorrect
* T65 - Deactivating User Accounts – Correct
* T66 - Deactivating User Accounts - Incorrect

**Manage Products**

* T67 - Editing Product Details - Correct
* T68 - Editing Product Details - Incorrect
* T69 - Uploading Product Images - Correct
* T70 - Uploading Product Images - Incorrect
* T71 - Categorizing Products - Correct
* T72 - Categorizing Products - Incorrect

**Manage Categories**

* T73 - Creating New Product Categories - Correct
* T74 - Creating New Product Categories - Incorrect
* T75 - Editing Product Categories - Correct
* T76 - Editing Product Categories - Incorrect
* T77 - Deleting Product Categories - Correct
* T78 - Deleting Product Categories – Incorrect

**View Site Analytics**

* T79 - SA01 - Viewing User Traffic Data – Correct
* T80 - SA02 - Verify Viewing User Traffic Data - Incorrect
* T81 - SA03 - Verify Tracking Conversion Rates - Correct
* T82 - SA04 - Verify Tracking Conversion Rates – Incorrect
* T83 - SA05 - Verify Viewing Demographic Information - Correct
* T84 - SA06 - Verify Viewing Demographic Information - Incorrect

**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.