

Software Requirements Specification (SRS)

Multi-Vendor E-commerce Platform

1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) describes the complete requirements for the Multi-Vendor E-commerce Platform. It specifies functional and non-functional requirements, system architecture, database entities, user roles, and system behavior. This document will be used by developers, testers, and stakeholders to understand the system's structure and expected behavior.

1.2 Scope

The platform allows **multiple sellers** to register and sell products, while customers can browse, purchase, and review items. The system provides authentication, secure checkout, order tracking, and an admin panel for platform management.

1.3 System Goals

- Enable sellers to easily list and manage products.
 - Provide customers with a smooth shopping and checkout experience.
 - Ensure secure and scalable operations.
 - Offer admins full visibility and control over platform activities.
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2. Overall Description

2.1 System Users (Actors)

Actor	Description
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Admin	Manages users, orders, products, and categories. Has full system privileges.
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Seller	Manages their own products and handles received orders.
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Customer	Browses items, purchases products, writes reviews, manages cart and orders.
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2.2 Assumptions

- Users must have valid email addresses.
- Internet availability is required.
- Payment is initially limited to Cash on Delivery (COD).

2.3 Constraints

- Authentication follows JWT standards.
 - All passwords must be securely hashed.
 - System must support responsive design.
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3. Functional Requirements

3.1 Authentication & Authorization

3.1.1 User Registration

- Users register using:
 - Name
 - Email
 - Password
 - Phone number
- Passwords are hashed before storing.

3.1.2 Login

- Login using email + password.
- Generate JWT token on successful login.

3.1.3 Role-Based Access

Roles:

- Admin
- Seller
- Customer

Each role has different permissions and view access.

3.2 Product Management

3.2.1 Add Product

- Seller provides:
 - Name
 - Description
 - Price
 - Stock
 - Category
 - Images

3.2.2 Edit Product

- Seller can update product details anytime.

3.2.3 Delete Product

- Seller can remove their own products only.
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3.3 Product Browsing & Search

3.3.1 Browse by Category

- Users can view products filtered by category.

3.3.2 Product Search

- Search by:
 - Name
 - Category
 - Keywords

3.3.3 Filtering

- By price range
- By customer rating

- By alphabetical order
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3.4 Shopping Cart & Checkout

3.4.1 Add to Cart

- Customers can add any product to their personal cart.

3.4.2 Update Cart

- Change product quantity.
- Remove items.

3.4.3 Checkout

Customer provides:

- Shipping address
- Payment method (Cash on Delivery)
- Contact phone

System calculates:

- Total price
 - Taxes (if applied)
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3.5 Order Management

3.5.1 Customer Order Tracking

Statuses:

- Pending
- Processing
- Shipped
- Delivered

3.5.2 Seller Order Handling

- Seller views orders containing their products.

- Seller updates order status.

3.5.3 Order History

- Customer can view previous orders.
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3.6 Reviews & Ratings

3.6.1 Submit Review

- Only customers who purchased the product can review it.

3.6.2 Product Rating

- Rating from 1 to 5 stars.
- Comment is optional.

3.6.3 Average Rating Calculation

- Product pages display:
 - Average rating
 - Review list (chronological)
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3.7 Admin Panel

Admin can:

- Manage users (delete, disable)
 - Manage all products
 - Manage categories
 - View and manage orders
 - View dashboard analytics:
 - Sales statistics
 - Most sold products
 - Top sellers
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4. Non-Functional Requirements

4.1 Security

- Password hashing (bcrypt recommended)
- JWT-based authentication
- Role authorization middleware

4.2 Performance

- Handle large number of concurrent users
- Pages must load under **2 seconds**

4.3 Usability

- Fully responsive UI
- Accessible from desktop, tablet, and mobile

4.4 Deployment

- Azure
- Any external cloud hosting
- Code hosted on GitHub

5. Entity Descriptions (Database Schema)

5.1 Users

- UserID (PK)
- Name
- Email
- PasswordHash
- Role
- PhoneNumber
- CreatedAt

5.2 Products

- ProductID (PK)
- Name
- Description
- Price
- Stock
- ImageUrl
- CategoryID (FK)
- SellerID (FK)

5.3 Categories

- CategoryID (PK)
- Name
- Description

5.4 Orders

- OrderID (PK)
- UserID (FK)
- TotalPrice
- Status
- CreatedAt
- ShippingAddressID (FK)

5.5 OrderItems

- OrderItemID (PK)
- OrderID (FK)
- ProductID (FK)
- Quantity
- Price

5.6 Cart

- CartID (PK)
- UserID (FK)
- CreatedAt

5.7 CartItems

- CartItemID (PK)
- CartID (FK)
- ProductID (FK)
- Quantity

5.8 Reviews

- ReviewID (PK)
- ProductID (FK)
- UserID (FK)
- Rating
- Comment
- CreatedAt

5.9 Addresses

- AddressID (PK)
- UserID (FK)
- Street
- City
- PostalCode
- Country

6. Entity Relationships

Entities

Relationship

Entities	Relationship
Users → Orders	One-to-Many
Users → Reviews	One-to-Many
Users → Addresses	One-to-Many
Users → Cart	One-to-One
Products → OrderItems	One-to-Many
Products → Reviews	One-to-Many
Products → Categories	Many-to-One
Orders → OrderItems	One-to-Many
Cart → CartItems	One-to-Many
CartItems → Products	Many-to-One

7. System Architecture (Overview)

7.1 Backend (API)

- RESTful API
- Authentication middleware
- Product, order, user, category controllers
- Database ORM (e.g., Prisma, Sequelize, EF Core)

7.2 Frontend

- Modern SPA framework (React / Angular / Vue)
- Responsive layout
- Dashboard for admin & sellers
- Customer-friendly UI

7.3 Database

- Relational DB (MySQL / PostgreSQL)
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8. Future Enhancements

- Online payment integration (Visa/Mastercard)
 - AI-based product recommendations
 - Multi-language support
 - Real-time chat between seller & customer
 - Analytics-based dynamic pricing
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9. Conclusion

This document represents a complete description of the Multi-Vendor E-commerce Platform based on the requirements extracted from your provided file. It is ready for development, documentation submission, and client presentation.