Shop Hub - Multi-Vendor E-Commerce Platform

Contents

1. Functional Requirements

1.1. User Management & Authentication (FR1)

- **FR1.1:** The system shall allow users (customers/vendors) to register using an email, username, and password.

- **FR1.2:** The system shall authenticate users using valid credentials (email/username and password).

- **FR1.3:** The system shall securely encrypt and store user passwords.

- **FR1.4:** The system shall display an error message for invalid login attempts.

1.2. Vendor & Product Management (FR2)

- **FR2.1:** The system shall allow vendors to Create, Read, Update, and Delete (CRUD) their product listings.

- **FR2.2:** A product listing shall include fields for name, description, price, and images.

1.3. Multi-Vendor Marketplace (FR3)

- **FR3.1:** The system shall aggregate and display products from all approved vendors in a unified catalog.

- **FR3.2:** The system shall provide a dedicated public profile or store page for each vendor.

1.4. Shopping Cart & Checkout (FR4)

- **FR4.1:** The system shall allow customers to add products from multiple vendors into a single shopping cart.

- **FR4.2:** The system shall allow customers to update item quantities and remove items from the cart.

- **FR4.3:** The cart shall update in real-time without requiring a page reload.

- **FR4.4:** The cart data shall persist for a logged-in user across sessions and for a guest user until the browser cache is cleared.

1.5. Order Processing & Fulfillment (FR5)

- **FR5.1:** Upon customer checkout, the system shall automatically split a single order into sub-orders grouped by vendor.

- **FR5.2:** The system shall present vendors with a view of only their own sub-orders for management.

- **FR5.3:** The system shall provide customers with a single, combined order summary that lists all sub-orders.

- **FR5.4:** The system shall allow vendors to update sub-order status (e.g., Processing, Shipped), visible to both the vendor and the customer.

1.6. Payments & Payouts (FR6)

- **FR6.1:** The system shall automatically split a customer's single payment to allocate funds to the respective vendors.

- **FR6.2:** The system shall automatically deduct a configurable platform commission during the payment split.

- **FR6.3:** The system shall automate payouts to vendors for their earnings after commission.

- **FR6.4:** The system shall provide vendors with a dashboard to view their payout history.

- **FR6.5:** The system shall provide customers with a single, consolidated invoice for their multi-vendor purchase.

1.7. Reviews & Ratings (FR7)

- **FR7.1:** The system shall allow customers to leave a star rating (1-5) and a text review for products and vendors.

- **FR7.2:** The system shall display reviews and the calculated average rating on the respective product and vendor pages.

- **FR7.3:** Vendors shall be unable to edit or delete customer reviews but shall be able to reply to them.

1.8. Search & Discovery (FR8)

- **FR8.1:** The search functionality shall provide real-time, instant results as the user types.

- **FR8.2:** The system shall allow customers to filter search results by price range, vendor, category, and rating.

- **FR8.3:** The search shall support keywords, product names, and tags.

- **FR8.4:** The system shall rank search results by relevance.

1.9. Notification System (FR9)

- **FR9.1:** The system shall send automated notifications to customers for order confirmation, shipping updates, and delivery.

- **FR9.2:** The system shall send automated notifications to vendors for new orders and successful payouts.

- **FR9.3:** Notifications shall be deliverable via both Email and Push Notifications (if enabled).

- **FR9.4:** Users shall be able to manage their notification preferences.

1.10. Admin Dashboard (FR10)

- **FR10.1:** The system shall provide an admin panel to manage (approve, suspend) user and vendor accounts.

- **FR10.2:** The system shall allow admins to remove or hide inappropriate products.

- **FR10.3:** The admin dashboard shall display platform analytics (total orders, sales volume, number of vendors, etc.).

- **FR10.4:** The system shall allow admins to view and configure platform commission rates.

2. Non-Functional Requirements (NFR)

- **NFR1 (Performance):** The product catalog and search pages shall load in under 3 seconds. Real-time search updates must appear within 500ms of user input.

- **NFR2 (Security):** The platform must be PCI-DSS compliant for handling payments. All data transmissions must use HTTPS. User data and vendor financial information must be encrypted at rest.

- **NFR3 (Scalability):** The system architecture must be scalable to handle a growing number of vendors, products, and concurrent users, especially during peak traffic.

- **NFR4 (Availability):** The platform shall maintain 99.9% uptime.

- **NFR5 (Usability):** The user interface shall be intuitive and responsive, providing a consistent experience across desktop and mobile devices.

3. Technical Stack Recommendations

- **Frontend:** React.js / Vue.js (for a dynamic, single-page application experience).

- **Backend:** Node.js / Python (Django) / Java (Spring Boot).

- **Database:** PostgreSQL or MongoDB (depending on structured vs. semi-structured data preference).

- **Search Engine:** Elasticsearch or Algolia (for high-performance real-time search).

- **Payment Gateway:** Stripe Connect / Adyen (for built-in split payment and payout capabilities).

- **Cloud Infrastructure:** AWS, Google Cloud, or Azure (for scalability and managed services).

- **Notifications:** SendGrid / Twilio (for Email & SMS), Firebase Cloud Messaging (for Push).

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4. Business & Compliance Requirements

- **BCR1:** The platform must integrate with a payment gateway that supports automated split payments and vendor payouts.

- **BCR2:** The system must generate reports for sales, commissions, and vendor payouts for accounting purposes.

- **BCR3:** The platform must be compliant with relevant data protection regulations (e.g., GDPR, CCPA).