Functional requirement document. (FRD)

Project: Shopping App
Version: 1.0
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Status:

1. Purpose

This document outlines the detailed functional requirements for the Shopping App project. It describes the expected behaviour of the system and serves as a reference for developers, testers, and stakeholders throughout the product lifecycle.

2. Scope

This FRD covers the core user and admin functionalities for the MVP release of the Shopping App, including registration, product browsing, cart management, checkout, and order tracking.

3. Assumptions

- The app will initially launch on Android only.
- Payment integration will use Razorpay.
- Product images and content will be provided by the client.
- Users can use the app as a guest or logged-in user.

Functional requirement.

FR-001: User Registration and Login

- Description: Enables users to register using email/mobile and log in securely.
- Trigger: User clicks “Sign Up” or “Log In”
- Inputs: Name, Email, Mobile Number, Password
- Pre-conditions: Email/mobile not already registered
- Process: Validate inputs → Store encrypted password → Send OTP (optional)
- Outputs: User account created; success message shown
- Validation: Email format, password length (min 8 chars)
- Error Handling: If duplicate email → “Account already exists”
- Dependencies: User DB, Authentication API

Alternate Flows:

- AF-001.1: Duplicate Email or Mobile Number
  → System shows: “Account already exists. Please log in.”
- AF-001.2: Incorrect Password on Login
  → System displays: “Incorrect password. Please try again.”
  → After 3 failed attempts: Optional captcha or lockout.
- AF-001.3: Forgot Password Flow
  → User clicks “Forgot Password” → System sends OTP/email link for reset → User resets password → redirected to login.
- AF-001.4: Invalid Input Format
  → System highlights field errors (e.g., “Invalid email format”, “Password must be at least 8 characters”).
- AF-001.5: Inactive or Locked Account
  → System displays: “Your account is inactive. Please contact support.”
- AF-001.6: Network/Server Issue During Registration
  → System shows: “Something went wrong. Please try again later.” and logs the error.

FR-002: Product Browsing and Search

- Description: Allows users to browse or search for products by category, brand, or keyword.
- Trigger: User opens Home or Search screen
- Inputs: Search term or category selected
- Pre-conditions: Product catalog is loaded
- Process: Fetch matching results → Apply filters
- Outputs: List of products matching the search
- Validation: Keyword must be at least 2 characters
- Error Handling: No results → “No products found”
- Dependencies: Product DB, Search Index

Alternate Flows:

- AF-002.1: No Search Results Found
  → System displays: “No products found. Try a different keyword or filter.”
- AF-002.2: Empty or Invalid Search Input
  → System prompts: “Please enter at least 2 characters to search.”
- AF-002.3: Filter Combination Returns No Results
  → System displays: “No items match your filters. Try resetting filters.”
- AF-002.4: Product Catalog Fails to Load
  → System shows: “We’re having trouble loading products. Please refresh or try again later.”
- AF-002.5: Slow Response from Search Index
  → System shows loading indicator or “Searching…” animation; if timeout → “Search took too long. Try again.”

FR-003: Add to Cart

- Description: Enables users to add selected products to their cart.
- Trigger: User clicks “Add to Cart”
- Inputs: Product ID, Quantity
- Pre-conditions: Product is in stock

- Process: Check stock → Add item to cart session
- Outputs: Cart updated; confirmation shown
- Validation: Max quantity per item ≤ 5
- Error Handling: Stock < requested → “Not enough stock”
- Dependencies: Inventory System

Alternate Flows:

- AF-003.1: Product Out of Stock
→ System shows: “This item is currently out of stock” and disables the “Add to Cart” button.
- AF-003.2: Quantity Exceeds Limit
→ System shows: “You can add a maximum of 5 units per item.”
- AF-003.3: Product Already in Cart
→ System increases the item quantity instead of duplicating it and updates the cart total.
- AF-003.4: User Not Logged In (Guest Session)
→ Product is added to a temporary session cart with a prompt to log in or create an account at checkout.

FR-004: Checkout and Payment

- Description: Handles address entry, payment processing, and order placement.
- Trigger: User clicks “Checkout”
- Inputs: Cart items, address, payment method
- Pre-conditions: Cart not empty
- Process: Validate address → Process payment → Generate order ID
- Outputs: Order confirmation screen
- Validation: Payment success/failure, required address fields
- Error Handling: Failed payment → “Payment unsuccessful”
- Dependencies: Razorpay API, Order DB

Alternate Flows:

- AF-004.1: Invalid or Incomplete Address
  → System prompts user: “Please complete all required address fields.”
- AF-004.2: Empty Cart at Checkout
  → System blocks checkout and shows: “Your cart is empty. Please add items to proceed.”
- AF-004.3: Payment Gateway Timeout or Failure
  → System shows: “Payment unsuccessful. Please try again.” and logs the error.
- AF-004.4: Payment Cancelled by User
  → System redirects to cart page with message: “Payment was cancelled.”
- AF-004.5: Duplicate Order Submission (double tap)
  → System detects duplicate and prevents second order; shows “Order already placed.”

FR-005: Order Tracking

- Description: Allows users to view their order history and real-time status.
- Trigger: User clicks on “My Orders”
- Inputs: User ID
- Pre-conditions: User has placed orders
- Process: Fetch order list from DB
- Outputs: Show order status and tracking updates
- Validation: Only show logged-in user's orders
- Error Handling: No orders → “No past orders found”
- Dependencies: Order DB, Delivery API

Alternate Flows:

- AF-005.1: No Orders Placed
  → System shows “You have no past orders yet.” and provides a “Start Shopping” button.
- AF-005.2: Delivery Tracking Not Available
  → System shows “Tracking information is currently unavailable. Please check again later.”
- AF-005.3: API Failure or Timeout
  → System shows “Unable to retrieve delivery status at this time.” and logs the error internally.
- AF-005.4: Unauthorised Access
  → System blocks access and shows “You are not authorised to view this order.”

Admin Login and Dashboard Access.

FR-006: Admin Login and Dashboard Access

- Description: Allows admin users to securely log in and access the backend dashboard.
- Trigger: Admin navigates to the admin portal login page.
- Inputs: Email/Username, Password
- Pre-conditions: Admin credentials must exist in the system.
- Process: Authenticate credentials → Start admin session → Redirect to dashboard.
- Outputs: Admin is taken to the main dashboard with summary widgets (Orders, Inventory, Revenue).
- Validation: Password must be at least 8 characters; account must be active.
- Error Handling: Show "Invalid login" or "Account deactivated."
- Dependencies: Admin DB, Auth Service

Alternate Flows:

- AF-006.1: Incorrect Credentials
  → System shows "Invalid email or password" and clears password field.
- AF-006.2: Inactive Account
  → System shows "Account has been deactivated. Contact support."
- AF-006.3: Session Timeout
  → If admin is inactive for 15 minutes, log them out and redirect to login page.

FR-007: Manage Product Catalog

- **Description**: Enables admins to create, update, or delete product listings in the inventory.
- **Trigger**: Admin selects "Add Product" or edits existing product.
- **Inputs**: Product name, SKU, description, category, price, stock quantity, images.
- **Pre-conditions**: Admin must be authenticated.

- **Process**: Validate inputs → Save to Product DB → Update listing view.
- **Outputs**: Product created/updated/deleted confirmation shown.
- **Validation**: Mandatory fields: Name, Price, Category; Price must be numeric; Stock must be ≥ 0.
- **Error Handling**: If missing required field → "Please complete all fields."
- **Dependencies**: Product DB, File Storage (for images)

Alternate Flows:

- AF-007.1: Missing Required Fields
  → System shows validation message: "Please complete all mandatory fields."
- AF-007.2: Duplicate SKU
  → System shows: "Product with this SKU already exists."
- AF-007.3: Image Upload Fails
  → Show: "Image upload failed. Try again or choose another file."
- AF-007.4: Update Attempt on Deleted Product
  → Show: "Product no longer available. Please refresh the list."

FR-008: View and Manage Orders

- Description: Allows admins to view, filter, and update the status of customer orders.
- Trigger: Admin clicks on the "Orders" menu.
- Inputs: Order ID, Customer Name, Date Range, Status (Placed, Shipped, Cancelled)
- Pre-conditions: Orders must exist in the system.
- Process: Admin selects filters → Orders are displayed → Status can be updated (e.g., mark as "Shipped").
- Outputs: Orders table with filterable, sortable fields.
- Validation: Status must be from predefined values.
- Error Handling: If order not found → show "No matching orders."
- Dependencies: Order DB, User DB

Alternate Flows:

- AF-008.1: No Matching Orders Found
→ Display: “No orders match your criteria. Please adjust your filters.”
- AF-008.2: Invalid Status Change
→ Admin tries to change “Delivered” order to “Cancelled” → System blocks and shows warning.
- AF-008.3: Order Data Error
→ If order data is corrupted or missing fields → System logs error and shows “Order details could not be loaded.”
- AF-008.4: Unauthorized Role Access
→ If a non-admin user tries accessing admin order screen → System redirects to homepage with access denied message.

Error Handling

Defines how the app responds to failures or incorrect inputs.

- If email is already registered → show “Account already exists.”
- If invalid login → show “Invalid email or password.”
- If no products found → show “No items match your search.”
- If payment fails → show “Payment unsuccessful. Please try again.”
- If cart is empty → disable checkout button and show a notice.

UI Requirement.

This section provides a high-level description of the user interface elements for key features.

UI-001: Registration/Login Screen

- Fields: Full Name, Email, Mobile Number, Password
- Buttons: Sign Up, Login, Forgot Password
- Messages: Error for invalid inputs, success upon login

UI-002: Product Listing Page

- Elements: Product image, name, price, rating, filter sidebar (price, brand, category)
- Actions: Tap to open product details, tap “Add to Cart”

UI-003: Cart Page

- Items displayed with quantity selector
- Buttons: Remove item, Update quantity, Proceed to Checkout

UI-004: Checkout Page

- Fields: Delivery address, payment method (UPI)/Razorpay
- Button: Place Order
- Status messages: “Processing payment...”, “Order confirmed”

UI-005: Order History Page

- Tabs: All, Delivered, Cancelled
- List with: Product name, order ID, date, status badge

Non-Functional Requirements (NFRs)

These describe how the system should perform, not what it does.

ID	Description
NFR-001	The app should load the homepage within 3 seconds on a 4G network.
NFR-002	The system must support at least 10,000. concurrent users.
NFR-003	Payment data must be encrypted using industry-standard protocols.
NFR-004	The app must be compatible with Android 10 and above.
NFR-005	The system should have 99.9% uptime.
NFR-006	All personal user data must comply with General Data Protection Regulation