# Functional Requirement

### Chapter 1: Functional Requirements  
  
\*\*1.1 Customer Registration Function\*\*   
Function ID: FR-01   
Description: Creates new customer accounts with secure credential storage and auto-generated shopping carts.   
Input: Registration form data (Username, Password, Email, PhoneNumber, FirstName, LastName, Address, City, State, Country, PostalCode)   
Output: New Customer entity, linked Personal Information entity, and Shopping Cart entity   
  
\*\*1.2 Customer Login Function\*\*   
Function ID: FR-02   
Description: Authenticates customers and initiates secure sessions using stored credentials.   
Input: Login credentials (Email, Password)   
Output: Active session token and Shopping Cart linkage   
  
\*\*1.3 Customer Logout Function\*\*   
Function ID: FR-03   
Description: Terminates authenticated sessions while preserving cart contents.   
Input: Active session token   
Output: Session termination confirmation and cart state preservation   
  
\*\*1.4 Personal Information View Function\*\*   
Function ID: FR-04   
Description: Retrieves and displays stored personal details in read-only format.   
Input: CustomerID   
Output: Formatted Personal Information entity data   
  
\*\*1.5 Personal Information Update Function\*\*   
Function ID: FR-05   
Description: Modifies stored personal details with real-time validation.   
Input: Updated Personal Information fields (Email, Address, etc.)   
Output: Updated Personal Information entity   
  
\*\*1.6 Purchase History View Function\*\*   
Function ID: FR-06   
Description: Compiles and displays chronological order records.   
Input: CustomerID   
Output: List of Order entities with itemized details   
  
\*\*1.7 Payment Information View Function\*\*   
Function ID: FR-07   
Description: Retrieves and displays payment methods with sensitive data masking.   
Input: CustomerID   
Output: Masked Payment Information entities (e.g., ●●●●1234)   
  
\*\*1.8 Payment Information Update Function\*\*   
Function ID: FR-08   
Description: Modifies stored payment methods via gateway verification.   
Input: Updated Payment Information fields (CardNumber, ExpirationDate, CVV)   
Output: Verified and encrypted Payment Information entity   
  
\*\*1.9 Category Creation Function\*\*   
Function ID: FR-09   
Description: Adds new product categories with uniqueness validation.   
Input: CategoryName, CategoryDescription   
Output: New Category entity   
  
\*\*1.10 Category Modification Function\*\*   
Function ID: FR-10   
Description: Edits existing category attributes and propagates changes.   
Input: CategoryID, Updated fields (CategoryName/Description)   
Output: Updated Category entity   
  
\*\*1.11 Category Deletion Function\*\*   
Function ID: FR-11   
Description: Removes unused categories after integrity verification.   
Input: CategoryID   
Output: Deletion confirmation and inventory relationship updates   
  
\*\*1.12 Product Creation Function\*\*   
Function ID: FR-12   
Description: Adds new products with linked inventory initialization.   
Input: ProductName, Description, Price, CategoryID, InitialStock   
Output: New Product entity and Inventory entity   
  
\*\*1.13 Product Modification Function\*\*   
Function ID: FR-13   
Description: Updates product details and synchronizes inventory data.   
Input: ProductID, Updated fields (Price/Description/Stock)   
Output: Updated Product and Inventory entities   
  
\*\*1.14 Product Deletion Function\*\*   
Function ID: FR-14   
Description: Removes products after verifying no active transactions.   
Input: ProductID   
Output: Deletion confirmation and inventory association removal   
  
\*\*1.15 Product Categorization Function\*\*   
Function ID: FR-15   
Description: Assigns products to active categories with concurrency checks.   
Input: ProductID, CategoryID   
Output: Updated Product-Category relationship   
  
\*\*1.16 Stock Update Function\*\*   
Function ID: FR-16   
Description: Modifies inventory quantities with cart reservation checks.   
Input: ProductID, NewStockQuantity   
Output: Updated Inventory entity and cart synchronization   
  
\*\*1.17 Inventory Restock Function\*\*   
Function ID: FR-17   
Description: Increases stock levels with safety buffer handling.   
Input: ProductID, RestockQuantity   
Output: Updated Inventory entity with new\_stock calculation   
  
\*\*1.18 Cart Addition Function\*\*   
Function ID: FR-18   
Description: Adds products to cart with real-time inventory validation.   
Input: ProductID, Quantity   
Output: New or updated Cart Item entity   
  
\*\*1.19 Cart View Function\*\*   
Function ID: FR-19   
Description: Displays cart contents with pricing and availability status.   
Input: CartID   
Output: Formatted Shopping Cart entity with linked Cart Items and Products   
  
\*\*1.20 Cart Item Update Function\*\*   
Function ID: FR-20   
Description: Modifies item quantities within inventory constraints.   
Input: CartItemID, NewQuantity   
Output: Updated Cart Item entity   
  
\*\*1.21 Cart Item Removal Function\*\*   
Function ID: FR-21   
Description: Deletes items from cart and releases inventory reservations.   
Input: CartItemID   
Output: Removal confirmation and stock release   
  
\*\*1.22 Cart Clearance Function\*\*   
Function ID: FR-22   
Description: Removes all cart items and resets totals.   
Input: CartID   
Output: Empty Shopping Cart entity and inventory release   
  
\*\*1.23 Checkout Initiation Function\*\*   
Function ID: FR-23   
Description: Validates cart items and prepares payment processing.   
Input: CartID, PaymentMethod   
Output: Checkout entity with transaction summary   
  
\*\*1.24 Checkout Cancellation Function\*\*   
Function ID: FR-24   
Description: Terminates checkout while preserving cart state.   
Input: CheckoutID   
Output: Cancellation confirmation and cart preservation   
  
\*\*1.25 Order Finalization Function\*\*   
Function ID: FR-25   
Description: Creates confirmed orders after payment verification.   
Input: CheckoutID   
Output: Order entity, Order Confirmation entity, inventory deduction   
  
\*\*1.26 Order View Function\*\*   
Function ID: FR-26   
Description: Retrieves and displays order details with linked entities.   
Input: OrderID   
Output: Formatted Order Confirmation data with itemized products   
  
\*\*1.27 Order Cancellation Function\*\*   
Function ID: FR-27   
Description: Cancels eligible orders and initiates refunds.   
Input: OrderID   
Output: "Canceled" Order status, inventory restoration, refund record   
  
\*\*1.28 Confirmation Email Function\*\*   
Function ID: FR-28   
Description: Generates and dispatches order confirmation emails.   
Input: OrderID   
Output: Email dispatch record in Order Confirmation entity   
  
\*\*1.29 Plugin Installation Function\*\*   
Function ID: FR-29   
Description: Integrates new plugins with compatibility validation.   
Input: PluginFile   
Output: Activated Plugin entity and API Specifications linkage   
  
\*\*1.30 Plugin Removal Function\*\*   
Function ID: FR-30   
Description: Uninstalls plugins with dependency checks.   
Input: PluginID   
Output: Removal confirmation and configuration rollback   
  
\*\*1.31 API Specification View Function\*\*   
Function ID: FR-31   
Description: Retrieves and displays documented plugin interfaces.   
Input: PluginID   
Output: Structured API Specifications data   
  
\*\*1.32 Customer Management Function\*\*   
Function ID: FR-32   
Description: Creates/updates/deactivates customer accounts by administrators.   
Input: Customer data fields, Action type (Add/Edit/Deactivate)   
Output: Modified Customer entity and linked resource updates   
  
\*\*1.33 Administrator Management Function\*\*   
Function ID: FR-33   
Description: Manages admin accounts with privilege controls.   
Input: Administrator data fields, Action type (Add/Edit/Deactivate)   
Output: Modified Administrator entity and session synchronization