# Functional Requirement

### 1. Functional Requirements   
#### 1.1 Customer Registration Function   
\*\*Function ID:\*\* FR-01   
\*\*Description:\*\* Allows new customers to register by submitting personal information. Validates input, creates a customer record, and sends a confirmation email.   
\*\*Input:\*\* Registration form data (Name, Email, Password, Address, Phone).   
\*\*Output:\*\* New record in Customer entity; confirmation email sent.   
  
#### 1.2 Customer Login Function   
\*\*Function ID:\*\* FR-02   
\*\*Description:\*\* Authenticates registered customers using credentials. Grants access upon successful verification.   
\*\*Input:\*\* Email and Password from login form.   
\*\*Output:\*\* Active customer session; session status update in Customer entity.   
  
#### 1.3 Customer Logout Function   
\*\*Function ID:\*\* FR-03   
\*\*Description:\*\* Terminates an active customer session and clears session data.   
\*\*Input:\*\* Logout request from authenticated session.   
\*\*Output:\*\* Session termination; logout activity logged.   
  
#### 1.4 Update Customer Information Function   
\*\*Function ID:\*\* FR-04   
\*\*Description:\*\* Allows customers to modify personal details (e.g., address, phone). Validates inputs before updating records.   
\*\*Input:\*\* Updated fields (Name, Address, Phone, etc.) via editable form.   
\*\*Output:\*\* Modified Customer entity record; confirmation message.   
  
#### 1.5 View Customer Profile Function   
\*\*Function ID:\*\* FR-05   
\*\*Description:\*\* Displays a customer’s profile information and order history.   
\*\*Input:\*\* Customer ID from active session.   
\*\*Output:\*\* Customer profile data (Name, Email, Address, Order History) displayed.   
  
#### 1.6 Delete Customer Function   
\*\*Function ID:\*\* FR-06   
\*\*Description:\*\* Allows administrators to permanently remove customer accounts and associated data.   
\*\*Input:\*\* Administrator selection of Customer ID to delete.   
\*\*Output:\*\* Removal of Customer entity record and linked Shopping Cart/Order data; activity logged.   
  
#### 1.7 Create Product Function   
\*\*Function ID:\*\* FR-07   
\*\*Description:\*\* Enables administrators to add new products with details (name, price, stock).   
\*\*Input:\*\* Product details (Name, Description, Price, StockQuantity, Category) via form.   
\*\*Output:\*\* New Product and Inventory entity records.   
  
#### 1.8 Update Product Details Function   
\*\*Function ID:\*\* FR-08   
\*\*Description:\*\* Allows administrators to edit product attributes and inventory levels.   
\*\*Input:\*\* Modified product fields (e.g., Price, StockQuantity).   
\*\*Output:\*\* Updated Product and Inventory entity records.   
  
#### 1.9 View Product Details Function   
\*\*Function ID:\*\* FR-09   
\*\*Description:\*\* Displays product information to customers or administrators.   
\*\*Input:\*\* Product ID from selection.   
\*\*Output:\*\* Product details (Name, Description, Price, StockStatus) displayed.   
  
#### 1.10 Delete Product Function   
\*\*Function ID:\*\* FR-10   
\*\*Description:\*\* Allows administrators to remove products and adjust inventory.   
\*\*Input:\*\* Administrator selection of Product ID to delete.   
\*\*Output:\*\* Removal of Product and linked Inventory records.   
  
#### 1.11 Create Administrator Function   
\*\*Function ID:\*\* FR-11   
\*\*Description:\*\* Allows privileged administrators to create new admin accounts.   
\*\*Input:\*\* Admin details (Name, Email, Password, Role) via form.   
\*\*Output:\*\* New Administrator entity record; confirmation email sent.   
  
#### 1.12 Update Administrator Information Function   
\*\*Function ID:\*\* FR-12   
\*\*Description:\*\* Enables administrators to modify their account details.   
\*\*Input:\*\* Updated fields (e.g., Password, Contact) via form.   
\*\*Output:\*\* Modified Administrator entity record; confirmation message.   
  
#### 1.13 Delete Administrator Function   
\*\*Function ID:\*\* FR-13   
\*\*Description:\*\* Allows authorized administrators to remove other admin accounts.   
\*\*Input:\*\* Administrator selection of Admin ID to delete.   
\*\*Output:\*\* Removal of Administrator entity record.   
  
#### 1.14 Administrator Login Function   
\*\*Function ID:\*\* FR-14   
\*\*Description:\*\* Authenticates administrators using credentials. Grants dashboard access upon success.   
\*\*Input:\*\* Email and Password from login form.   
\*\*Output:\*\* Active administrator session; session status update.   
  
#### 1.15 Administrator Logout Function   
\*\*Function ID:\*\* FR-15   
\*\*Description:\*\* Terminates an active administrator session.   
\*\*Input:\*\* Logout request from authenticated session.   
\*\*Output:\*\* Session termination; activity logged.   
  
#### 1.16 Create Inventory Function   
\*\*Function ID:\*\* FR-16   
\*\*Description:\*\* Allows administrators to create inventory records linked to products.   
\*\*Input:\*\* Product ID and inventory details (StockLevel, ReorderThreshold).   
\*\*Output:\*\* New Inventory entity record linked to Product.   
  
#### 1.17 Update Inventory Levels Function   
\*\*Function ID:\*\* FR-17   
\*\*Description:\*\* Enables administrators to adjust stock quantities or thresholds.   
\*\*Input:\*\* Inventory ID and updated fields (e.g., StockLevel).   
\*\*Output:\*\* Modified Inventory entity record.   
  
#### 1.18 View Inventory Levels Function   
\*\*Function ID:\*\* FR-18   
\*\*Description:\*\* Displays current inventory data for administrators.   
\*\*Input:\*\* Inventory ID or Product ID.   
\*\*Output:\*\* Inventory details (StockLevel, Location) displayed.   
  
#### 1.19 Delete Inventory Function   
\*\*Function ID:\*\* FR-19   
\*\*Description:\*\* Allows administrators to remove inventory records.   
\*\*Input:\*\* Administrator selection of Inventory ID to delete.   
\*\*Output:\*\* Removal of Inventory entity record.   
  
#### 1.20 Add Product to Shopping Cart Function   
\*\*Function ID:\*\* FR-20   
\*\*Description:\*\* Adds a product to the customer’s shopping cart with specified quantity.   
\*\*Input:\*\* Product ID and Quantity from product page.   
\*\*Output:\*\* Product added/updated in Shopping Cart entity; cart total recalculated.   
  
#### 1.21 View Shopping Cart Function   
\*\*Function ID:\*\* FR-21   
\*\*Description:\*\* Displays contents of the customer’s shopping cart.   
\*\*Input:\*\* Shopping Cart ID from session.   
\*\*Output:\*\* Cart items (Product ID, Quantity, Price) and total cost displayed.   
  
#### 1.22 Update Shopping Cart Function   
\*\*Function ID:\*\* FR-22   
\*\*Description:\*\* Modifies product quantities or removes items from the cart.   
\*\*Input:\*\* Cart Item ID and new Quantity (or removal request).   
\*\*Output:\*\* Updated/removed item in Shopping Cart entity; cart total recalculated.   
  
#### 1.23 Place Order Function   
\*\*Function ID:\*\* FR-23   
\*\*Description:\*\* Converts shopping cart items into an order, updates inventory, and sends confirmation.   
\*\*Input:\*\* Shipping address, Payment method, and Cart ID.   
\*\*Output:\*\* New Order and Order Item records; Inventory updated; confirmation email sent.   
  
#### 1.24 View Order History Function   
\*\*Function ID:\*\* FR-24   
\*\*Description:\*\* Displays a customer’s past orders.   
\*\*Input:\*\* Customer ID from session.   
\*\*Output:\*\* List of orders (Order ID, Date, Total, Status) displayed.   
  
#### 1.25 Confirm Order Function   
\*\*Function ID:\*\* FR-25   
\*\*Description:\*\* Finalizes a pending order after customer review, reducing inventory stock.   
\*\*Input:\*\* Order ID and customer confirmation.   
\*\*Output:\*\* Order status updated to "confirmed"; Inventory levels adjusted.   
  
#### 1.26 Delete Order Function   
\*\*Function ID:\*\* FR-26   
\*\*Description:\*\* Allows administrators to remove orders and optionally restore inventory.   
\*\*Input:\*\* Administrator selection of Order ID to delete.   
\*\*Output:\*\* Removal of Order and Order Item records; Inventory optionally restored.   
  
#### 1.27 Install Plugin Function   
\*\*Function ID:\*\* FR-27   
\*\*Description:\*\* Integrates new plugins into the system after validation.   
\*\*Input:\*\* Plugin file or configuration.   
\*\*Output:\*\* New Plugin entity record; plugin activated.   
  
#### 1.28 Update Plugin Function   
\*\*Function ID:\*\* FR-28   
\*\*Description:\*\* Upgrades existing plugins to new versions.   
\*\*Input:\*\* Updated plugin file or configuration.   
\*\*Output:\*\* Modified Plugin entity record; plugin reactivated.   
  
#### 1.29 View Available Plugins Function   
\*\*Function ID:\*\* FR-29   
\*\*Description:\*\* Lists installed and available plugins for administrators.   
\*\*Input:\*\* None (requires admin session).   
\*\*Output:\*\* Plugin details (Name, Version, Status) displayed.   
  
#### 1.30 Uninstall Plugin Function   
\*\*Function ID:\*\* FR-30   
\*\*Description:\*\* Removes plugins and deactivates their functionality.   
\*\*Input:\*\* Administrator selection of Plugin ID to uninstall.   
\*\*Output:\*\* Removal of Plugin entity record; plugin deactivated.   
  
#### 1.31 Manage Order Item Function   
\*\*Function ID:\*\* FR-31   
\*\*Description:\*\* Allows administrators to modify order items (e.g., quantity, status).   
\*\*Input:\*\* Order Item ID and updated fields (e.g., Status, Quantity).   
\*\*Output:\*\* Modified Order Item record; Inventory adjusted if needed.   
  
#### 1.32 View Administrator Profile Function   
\*\*Function ID:\*\* FR-32   
\*\*Description:\*\* Displays an administrator’s profile information.   
\*\*Input:\*\* Admin ID from session.   
\*\*Output:\*\* Administrator profile data (Name, Email, Role) displayed.   
  
#### 1.33 Create Shopping Cart Function   
\*\*Function ID:\*\* FR-33   
\*\*Description:\*\* Initializes a new shopping cart for a customer or guest.   
\*\*Input:\*\* Customer ID (or guest session token).   
\*\*Output:\*\* New Shopping Cart entity record.   
  
#### 1.34 Delete Shopping Cart Function   
\*\*Function ID:\*\* FR-34   
\*\*Description:\*\* Allows administrators to remove inactive shopping carts.   
\*\*Input:\*\* Administrator selection of Cart ID to delete.   
\*\*Output:\*\* Removal of Shopping Cart entity record.   
  
#### 1.35 Login Administrator Function   
\*\*Function ID:\*\* FR-35   
\*\*Description:\*\* Authenticates administrators to access the admin dashboard.   
\*\*Input:\*\* Email and Password via login form.   
\*\*Output:\*\* Active administrator session; session status updated.

# External Description

### Chapter 2: External Interfaces  
  
#### 2.1 User Interface  
  
The system interacts with users through a graphical user interface (GUI) that includes web pages and forms for both customers and administrators. The interface will be implemented using standard web technologies such as HTML, CSS, and JavaScript. The GUI will provide an intuitive and user-friendly experience, including:  
  
- \*\*Customer Registration Form\*\*: A form for new customers to input personal information such as name, email, password, address, and phone number.  
- \*\*Customer Login Form\*\*: A form for customers to input their email and password to authenticate.  
- \*\*Customer Profile Page\*\*: A page displaying the customer's profile information and order history.  
- \*\*Product Details Page\*\*: A page displaying product information such as name, description, price, and stock status.  
- \*\*Shopping Cart Page\*\*: A page displaying the contents of the customer's shopping cart, including product IDs, quantities, prices, and total cost.  
- \*\*Order History Page\*\*: A page listing the customer's past orders, including order ID, date, total, and status.  
- \*\*Administrator Dashboard\*\*: A dashboard for administrators to manage products, inventory, orders, customer accounts, and plugins.  
  
#### 2.2 Hardware Interface  
  
The system will interact with external hardware devices through standard communication protocols. The primary hardware interfaces include:  
  
- \*\*Printers\*\*: For printing order confirmations, invoices, and shipping labels. The system will support standard printing protocols such as USB and network printing.  
- \*\*Barcode Scanners\*\*: For scanning product barcodes during inventory management and order fulfillment. The system will support standard barcode scanning protocols such as USB and Bluetooth.  
  
#### 2.3 Software Interface  
  
The system will interact with several software components, including databases, third-party services, and plugins. These interfaces are crucial for the system's functionality and include:  
  
- \*\*Database Interface\*\*: The system will use a relational database management system (RDBMS) such as MySQL or PostgreSQL to store data entities such as customers, products, orders, and inventory. The database will be accessed using SQL queries through an ORM (Object-Relational Mapping) tool.  
- \*\*Email Server Interface\*\*: The system will integrate with an email server using the SMTP protocol to send confirmation emails, order notifications, and other system-generated emails.  
- \*\*Payment Gateway Interface\*\*: The system will integrate with a third-party payment gateway such as PayPal or Stripe to process payments. The integration will use RESTful APIs to handle payment processing securely.  
- \*\*Plugin Interface\*\*: The system will support the installation, updating, and uninstallation of plugins. Plugins will be integrated using a standardized plugin framework that allows for easy extension of system functionality.  
  
#### 2.4 Communication Interface  
  
The system will use various communication interfaces to interact with external systems and users. These interfaces include:  
  
- \*\*Web Browser\*\*: The system will be accessible through standard web browsers such as Chrome, Firefox, and Safari. The system will use HTTP/HTTPS protocols to communicate with the web server.  
- \*\*Email Notifications\*\*: The system will send email notifications for events such as registration confirmation, order confirmation, and password reset. These notifications will be sent using the SMTP protocol.  
- \*\*API Communication\*\*: The system will use RESTful APIs to communicate with third-party services such as payment gateways and email servers. The APIs will be secured using HTTPS and authentication mechanisms such as OAuth or API keys.  
  
By carefully defining these external interfaces, the system will be able to interact seamlessly with users, hardware, and other software components, ensuring a robust and scalable solution.