# Functional Requirement

1.1 Customer Registration Function   
Function ID: FR-01   
Description: Customers can register a new account by providing personal details such as name, email, and password. The system validates the email and password, and sends a confirmation email to activate the account.   
Input: Name, email address, password, confirmation of terms and conditions.   
Output: A new customer account is created and stored in the system. The customer receives an email confirmation and a success message after clicking the confirmation link.  
  
1.2 Customer Login Function   
Function ID: FR-02   
Description: Customers can log in to their account by entering their registered email and password. The system validates the credentials, logs in the customer, and redirects them to their account dashboard.   
Input: Registered email address, password.   
Output: The customer is successfully logged in, and the login activity is recorded. The customer is redirected to the account dashboard.  
  
1.3 View Product List Function   
Function ID: FR-03   
Description: Customers can view a list of available products, including name, price, description, and category. The system supports filtering and sorting options.   
Input: User request to view products, optional filter or sort criteria.   
Output: A displayed list of products with relevant details. The system logs the access to the product list.  
  
1.4 Add Product to Cart Function   
Function ID: FR-04   
Description: Customers can add a selected product to their shopping cart. The system checks the product’s availability and updates the cart accordingly.   
Input: Selected product, quantity (optional).   
Output: The product is added to the shopping cart. The cart display is updated, and a confirmation message is shown.  
  
1.5 Update Cart Contents Function   
Function ID: FR-05   
Description: Customers can modify the quantity of items in their shopping cart or remove items. The system recalculates the total cost and saves the updated cart.   
Input: Cart item selection, new quantity or removal request.   
Output: Updated cart with modified items. The system recalculates and displays the total cost, and saves the cart state.  
  
1.6 Remove Product from Cart Function   
Function ID: FR-06   
Description: Customers can remove a selected product from their shopping cart. The system updates the cart and displays the new total.   
Input: Selected product to remove.   
Output: The product is removed from the cart. The system updates the cart and displays the new total.  
  
1.7 View Cart Summary Function   
Function ID: FR-07   
Description: Customers can view a summary of their shopping cart, including all items, their quantities, prices, and the total amount.   
Input: User request to view cart summary.   
Output: Cart summary displayed with items and total amount. The system logs the access to the cart summary.  
  
1.8 Checkout Function   
Function ID: FR-08   
Description: Customers can proceed to checkout with their selected items. The system collects shipping details, processes the selected payment method, and creates a new order.   
Input: Shopping cart contents, shipping address, contact information, selected payment method.   
Output: A new order is created and processed. The shopping cart is cleared, and the customer receives an email confirmation.  
  
1.9 Confirm Order Function   
Function ID: FR-09   
Description: After a successful payment, the customer can confirm their order. The system updates the order status and sends a confirmation email.   
Input: User request to confirm order.   
Output: Order status is updated to "confirmed", and the customer receives an email with the order summary and expected delivery date.  
  
1.10 Receive Order Confirmation Email Function   
Function ID: FR-10   
Description: After the order is confirmed, the customer receives an order confirmation email containing the order details and delivery information.   
Input: Order confirmation event.   
Output: Order confirmation email sent to the customer. The system logs the email delivery.  
  
1.11 Administrator Login Function   
Function ID: FR-11   
Description: Administrators can log in to the system using their username and password. The system validates the credentials and redirects them to the admin dashboard.   
Input: Administrator username, password.   
Output: Administrator is successfully logged in and redirected to the admin dashboard. The login activity is recorded.  
  
1.12 Manage Inventory Function   
Function ID: FR-12   
Description: Administrators can manage the inventory by adding, updating, or removing products. The system validates input data and updates the inventory database.   
Input: Product information (e.g., name, price, stock quantity), action (add, update, remove).   
Output: Inventory database is updated with the new or modified product data. The system logs the action and displays a confirmation message.  
  
1.13 Update Product Details Function   
Function ID: FR-13   
Description: Administrators can update the details of an existing product, including name, price, description, category, and stock quantity.   
Input: Product ID, updated product information.   
Output: Product record in the database is updated. Inventory is adjusted if necessary. The system logs the action.  
  
1.14 Categorize Products Function   
Function ID: FR-14   
Description: Administrators can assign products to specific categories to improve product organization and searchability.   
Input: Product ID, selected category.   
Output: Product is updated with the new category. The system logs the categorization action.  
  
1.15 Create Category Function   
Function ID: FR-15   
Description: Administrators can create new categories to organize products. The system validates the category name and prevents duplicates.   
Input: Category name, description.   
Output: New category is created and stored in the system. The system logs the action and displays a confirmation message.  
  
1.16 Delete Category Function   
Function ID: FR-16   
Description: Administrators can delete an existing category if it is not assigned to any active products.   
Input: Category ID, confirmation to delete.   
Output: Category is removed from the system. The system logs the deletion and displays a confirmation message.  
  
1.17 Manage Plugin Function   
Function ID: FR-17   
Description: Administrators can manage plugins by installing, updating, deactivating, or deleting them. The system validates compatibility and logs the action.   
Input: Plugin name, version, configuration details, action (install, update, deactivate, delete).   
Output: Plugin status is updated in the system. The system logs the action and displays a confirmation message.  
  
1.18 View Payment Information Function   
Function ID: FR-18   
Description: Customers can view their saved payment methods, including card type, last four digits, expiration date, and default status.   
Input: User request to view payment information.   
Output: Saved payment methods are displayed. The system logs the access.  
  
1.19 Manage Customer Function   
Function ID: FR-19   
Description: Administrators can manage customer accounts by editing details, blocking accounts, or deleting accounts. The system validates the selected action and logs it.   
Input: Customer ID, action (edit, block, delete), updated information if applicable.   
Output: Customer account is modified or removed. The system logs the action and displays a confirmation message.  
  
1.20 Manage Product Function   
Function ID: FR-20   
Description: Administrators can add new products, update existing products, or delete products from the system. The system validates input data and updates the inventory if necessary.   
Input: Product information (e.g., name, price, description, category, stock quantity), action (add, update, delete).   
Output: Product database is updated. Inventory is adjusted if needed. The system logs the action and displays a confirmation message.  
  
1.21 Manage Order Function   
Function ID: FR-21   
Description: Administrators can manage orders by updating their status, modifying order details, or deleting orders. The system validates the action and sends notifications to customers if applicable.   
Input: Order ID, action (update status, modify details, delete), new status or updated information.   
Output: Order database is updated. Inventory is adjusted if items are modified or removed. The system logs the action and notifies the customer if needed.

# External Description

2. External Interfaces   
The system interacts with various external interfaces to fulfill its functional requirements. These interfaces are categorized into user interfaces, hardware interfaces, software interfaces, and communication interfaces.   
  
2.1 User Interface Output   
User interfaces are the primary means of interaction between the system and its users (customers and administrators). The system provides a responsive and intuitive web-based interface for all user-facing functions.   
  
- \*\*Customer Account Management Interface\*\*:   
 This interface allows customers to register, log in, and manage their account. It includes input fields for name, email, password, and terms of service acceptance. The output includes success/failure messages, confirmation links, and redirection to the account dashboard.   
  
- \*\*Product Browsing and Filtering Interface\*\*:   
 Customers can view a list of products with details such as name, price, description, and category. The interface supports sorting and filtering by category, price, and other attributes. It also displays a log of product list accesses.   
  
- \*\*Shopping Cart Interface\*\*:   
 The interface allows customers to add, update, or remove items from their shopping cart. It displays the items, quantities, prices, and total cost in real time. The cart is updated dynamically based on user actions, and a confirmation message is shown for each change.   
  
- \*\*Checkout Interface\*\*:   
 This interface collects the customer's shipping details, contact information, and selected payment method. It provides a summary of the order and processes the checkout. After a successful transaction, the cart is cleared and a confirmation message is displayed.   
  
- \*\*Order Confirmation Interface\*\*:   
 Customers can confirm their order after payment. The interface provides a summary of the order, delivery date, and confirmation status. The system updates the order status and sends a confirmation email.   
  
- \*\*Admin Dashboard Interface\*\*:   
 Administrators access this interface to manage inventory, products, categories, plugins, and customer accounts. It includes input forms for product and category details, action buttons for managing plugins and orders, and displays confirmation messages after each action.   
  
- \*\*Payment Method Management Interface\*\*:   
 Customers can view their saved payment methods, including card type, last four digits, expiration date, and default status. This interface is used to display and manage payment information securely.   
  
2.2 Hardware Interface Output   
The system does not directly interact with any hardware devices. Therefore, no hardware interfaces are required for this system.   
  
2.3 Software Interface Output   
The system interacts with several software components, including databases, third-party APIs, and internal modules.   
  
- \*\*Customer Database\*\*:   
 The system stores and retrieves customer data, including name, email, password, and account status. It validates email and password inputs and updates the database upon successful registration or login. The database also tracks login activity and customer account modifications.   
  
- \*\*Product Inventory Database\*\*:   
 This database holds product information such as name, price, description, category, and stock quantity. Administrators update or delete products, and the system checks product availability when adding to the cart. The database is also updated when products are added, modified, or removed.   
  
- \*\*Order Management Database\*\*:   
 The system records all order details, including customer information, product list, quantities, shipping address, payment method, and order status. It updates the order status when a customer confirms their order or when an administrator modifies it. The database also logs order-related activities and adjusts inventory accordingly.   
  
- \*\*Email Service API\*\*:   
 The system uses an external email service API to send confirmation emails to customers after registration, checkout, and order confirmation. The API receives the customer's email address and the content of the message, then sends it and logs the delivery status.   
  
- \*\*Payment Processing API\*\*:   
 During checkout, the system interacts with a payment processing API to validate and process the customer's selected payment method. The API receives payment information and returns a success or failure response. This interaction is essential for completing the checkout process.   
  
- \*\*Plugin Management Module\*\*:   
 The system includes a plugin management module that allows administrators to install, update, deactivate, or delete plugins. The module validates plugin compatibility and updates the system accordingly. It also logs each plugin-related action.   
  
2.4 Communication Interface Output   
The system communicates with external systems and users through various communication channels.   
  
- \*\*Email Communication\*\*:   
 The system sends emails to customers for account confirmation, order confirmation, and delivery updates. The email communication is triggered by specific events, such as customer registration or order completion. The system logs all email deliveries for tracking and auditing purposes.   
  
- \*\*Web Browsing (HTTP/HTTPS)\*\*:   
 Customers and administrators access the system through web browsers using HTTP/HTTPS protocols. This communication allows them to interact with the system's user interface and perform actions such as logging in, browsing products, and managing orders.   
  
- \*\*API Communication (RESTful)\*\*:   
 The system communicates with external services like the email service and payment processing service using RESTful APIs. These APIs are accessed via HTTP/HTTPS and follow standard JSON-based request and response formats.   
  
- \*\*Internal System Logs\*\*:   
 The system generates internal logs for all user activities and system events, such as login attempts, cart modifications, order status changes, and plugin actions. These logs are stored in a centralized logging system for auditing and troubleshooting.   
  
By clearly defining these external interfaces, the system ensures seamless interaction with users, databases, APIs, and communication channels, enabling efficient and reliable operation.