# Functional Requirement

1. Functional Requirements  
  
1.1 Customer Registration Function   
 Function ID: FR-01   
 Description: Customers can create a new account by providing personal information. The system validates the email for uniqueness and the password for strength.   
 Input: Customer's personal information including name, email, and password.   
 Output: A successfully registered customer account in the Customer data entity and a confirmation message sent to the customer.  
  
1.2 Customer Login Function   
 Function ID: FR-02   
 Description: Registered customers can log in using their email and password. The system verifies the credentials and logs the login activity.   
 Input: Customer's email and password.   
 Output: A logged-in customer session and a homepage or dashboard displayed to the customer.  
  
1.3 Customer Logout Function   
 Function ID: FR-03   
 Description: Customers can log out of their session. The system invalidates the session and logs the logout activity.   
 Input: Customer's request to log out.   
 Output: A logged-out customer session and the customer redirected to the login or home page.  
  
1.4 Product Browsing Function   
 Function ID: FR-04   
 Description: Customers can browse products by category and view product details.   
 Input: Customer's selected category or request to view product details.   
 Output: A list of products in the selected category or detailed product information displayed to the customer.  
  
1.5 Product Search Function   
 Function ID: FR-05   
 Description: Customers can search for products using keywords or filters.   
 Input: Search term or selected filters (e.g., category, price range).   
 Output: A list of search results including product name, price, and image.  
  
1.6 Shopping Cart Addition Function   
 Function ID: FR-06   
 Description: Customers can add products to their shopping cart. The system verifies inventory availability and updates the cart.   
 Input: Product ID and quantity selected by the customer.   
 Output: Updated shopping cart with the new item and confirmation message.  
  
1.7 Shopping Cart Modification Function   
 Function ID: FR-07   
 Description: Customers can modify the quantity or remove items from their shopping cart. The system recalculates the cart total.   
 Input: Cart item modification request (e.g., quantity change, item removal).   
 Output: Updated shopping cart and confirmation message.  
  
1.8 Shopping Cart Deletion Function   
 Function ID: FR-08   
 Description: Customers can clear all items from their shopping cart.   
 Input: Customer's request to delete the cart.   
 Output: An empty shopping cart and confirmation message.  
  
1.9 Order Placement Function   
 Function ID: FR-09   
 Description: Customers can place an order by confirming the cart and completing the checkout process. The system updates the inventory and sends a confirmation.   
 Input: Shopping cart with valid items and payment method selected by the customer.   
 Output: A new order record and inventory updated with reduced stock levels.  
  
1.10 Order Confirmation Function   
 Function ID: FR-10   
 Description: The system confirms the order and sends a confirmation message to the customer.   
 Input: Order details and customer contact information.   
 Output: Order confirmation status updated and a confirmation message sent to the customer.  
  
1.11 Order History Viewing Function   
 Function ID: FR-11   
 Description: Registered customers can view their previous orders and access order details.   
 Input: Request from the customer to view their order history.   
 Output: A list of past orders with details displayed to the customer.  
  
1.12 Inventory Management Function   
 Function ID: FR-12   
 Description: Administrators can manage product inventory levels, including updates and alerts for restocking.   
 Input: Product inventory update request from the administrator.   
 Output: Updated inventory levels and restocking alerts generated as needed.  
  
1.13 Product Category Creation Function   
 Function ID: FR-13   
 Description: Administrators can create new product categories.   
 Input: Category name, description, and other relevant details provided by the administrator.   
 Output: A new category added to the Product Category data entity.  
  
1.14 Product Category Update Function   
 Function ID: FR-14   
 Description: Administrators can update existing product categories.   
 Input: Category ID and updated details (e.g., name, description).   
 Output: Updated category information in the Product Category data entity.  
  
1.15 Product Category Deletion Function   
 Function ID: FR-15   
 Description: Administrators can delete product categories after reassigning or removing associated products.   
 Input: Category ID and confirmation to delete.   
 Output: Deleted category and updated product records.  
  
1.16 Payment Processing Function   
 Function ID: FR-16   
 Description: Customers can process payments during checkout. The system verifies the payment and updates the order and inventory.   
 Input: Payment method and payment details provided by the customer.   
 Output: Confirmed payment status and updated order and inventory data.  
  
1.17 Payment Information Update Function   
 Function ID: FR-17   
 Description: Customers can update their stored payment information.   
 Input: Updated payment method details provided by the customer.   
 Output: Updated payment information in the Payment data entity.  
  
1.18 Contact Information Management Function   
 Function ID: FR-18   
 Description: Customers can add, modify, or delete their contact information.   
 Input: Updated or new contact details (e.g., address, phone number).   
 Output: Updated contact information in the Contact Information data entity.  
  
1.19 Plugin Installation Function   
 Function ID: FR-19   
 Description: Administrators can install plugins to extend system functionality.   
 Input: Plugin name and installation request from the administrator.   
 Output: Installed and activated plugin, with event logged in the Plugin data entity.  
  
1.20 Plugin Configuration Function   
 Function ID: FR-20   
 Description: Administrators can configure the settings of an installed plugin.   
 Input: Plugin configuration settings provided by the administrator.   
 Output: Updated plugin configuration in the PluginConfiguration data entity.  
  
1.21 Plugin Uninstallation Function   
 Function ID: FR-21   
 Description: Administrators can uninstall plugins after ensuring they are not in use.   
 Input: Plugin ID and uninstall request from the administrator.   
 Output: Removed plugin and associated configurations, with event logged.  
  
1.22 Manage Order Confirmation Function   
 Function ID: FR-22   
 Description: Administrators can modify the confirmation status of an order and send updated notifications to customers.   
 Input: Order confirmation status change request from the administrator.   
 Output: Updated order confirmation status and notification sent to the customer.  
  
1.23 Manage Cart Item Function   
 Function ID: FR-23   
 Description: Customers can modify or remove specific items in their shopping cart. The system updates the cart and inventory.   
 Input: Cart item modification or deletion request from the customer.   
 Output: Updated shopping cart and inventory levels if necessary.  
  
1.24 Manage Plugin Configuration Function   
 Function ID: FR-24   
 Description: Administrators can modify the configuration settings of an installed plugin.   
 Input: Plugin configuration update request from the administrator.   
 Output: Updated plugin configuration in the PluginConfiguration data entity.  
  
1.25 Manage Product Function   
 Function ID: FR-25   
 Description: Administrators can add, modify, or delete products and their associated category and inventory.   
 Input: Product details (e.g., name, price, category, inventory) from the administrator.   
 Output: Updated product records in the Product, Product Category, and Inventory data entities.  
  
1.26 Manage Order Function   
 Function ID: FR-26   
 Description: Administrators can modify or process orders, including updating status and initiating refunds.   
 Input: Order modification or processing request from the administrator.   
 Output: Updated order status and inventory levels if necessary.  
  
1.27 Manage Administrator Function   
 Function ID: FR-27   
 Description: Super Administrators can add, modify, or deactivate other administrators.   
 Input: Administrator details (e.g., username, role, status) from the super administrator.   
 Output: Updated administrator records in the Administrator data entity.  
  
1.28 Manage Payment Function   
 Function ID: FR-28   
 Description: Administrators can review and modify payment records, including initiating refunds.   
 Input: Payment modification or refund request from the administrator.   
 Output: Updated payment status and associated order records.  
  
1.29 Manage Plugin Function   
 Function ID: FR-29   
 Description: Administrators can activate, deactivate, or remove plugins and their configurations.   
 Input: Plugin management request from the administrator.   
 Output: Updated plugin status and configurations in the Plugin and PluginConfiguration data entities.  
  
1.30 Manage Order Confirmation Function   
 Function ID: FR-30   
 Description: Administrators can update the confirmation status of an order and send notifications to the customer.   
 Input: Order confirmation status update request from the administrator.   
 Output: Updated order confirmation status and customer notification if required.

# External Description

2. External Interfaces   
The system interacts with various external interfaces to fulfill its functional requirements. These interfaces include user interfaces for customer and administrator interactions, software interfaces for data management, and communication interfaces for notifications and updates.   
  
2.1 User Interface Output   
The system provides a graphical user interface (GUI) for both customers and administrators. The GUI allows for intuitive interaction with the system through web-based and mobile platforms.   
  
- \*\*Customer Account Interface\*\*:   
 - \*\*Description\*\*: A web-based or mobile interface that enables customers to register, log in, and manage their accounts.   
 - \*\*Interaction Method\*\*: Form-based input for registration and login, with confirmation messages displayed on the screen.   
  
- \*\*Product Browsing Interface\*\*:   
 - \*\*Description\*\*: A user interface that allows customers to browse products by category and view product details.   
 - \*\*Interaction Method\*\*: Dropdown menus or clickable categories for navigation, product detail pages with images, descriptions, and pricing.   
  
- \*\*Product Search Interface\*\*:   
 - \*\*Description\*\*: A search interface that allows customers to input keywords or select filters to find products.   
 - \*\*Interaction Method\*\*: Search bar for keyword entry, filter options for refining results, and a results page displaying product name, price, and image.   
  
- \*\*Shopping Cart Interface\*\*:   
 - \*\*Description\*\*: A user interface for managing the shopping cart, including adding, modifying, and removing items.   
 - \*\*Interaction Method\*\*: Buttons or input fields to adjust quantities and remove items, with real-time updates to the cart total and confirmation messages.   
  
- \*\*Checkout Interface\*\*:   
 - \*\*Description\*\*: A user interface where customers confirm their orders and process payments.   
 - \*\*Interaction Method\*\*: Form-based input for payment method selection, with real-time validation and confirmation messages.   
  
- \*\*Order History Interface\*\*:   
 - \*\*Description\*\*: A user interface for customers to view their past orders and associated details.   
 - \*\*Interaction Method\*\*: List view of previous orders with clickable entries to expand and display order details.   
  
- \*\*Administrator Interface\*\*:   
 - \*\*Description\*\*: A web-based interface for administrators to manage inventory, categories, plugins, orders, and other administrative functions.   
 - \*\*Interaction Method\*\*: Dashboard-style interface with tabs for different administrative functions, form-based input for updates, and confirmation messages.   
  
2.2 Hardware Interface Output   
The system does not directly interact with any external hardware devices and does not require specific hardware interfaces.   
  
2.3 Software Interface Output   
The system interacts with several internal and external software systems and data entities to manage customer accounts, products, orders, and plugins.   
  
- \*\*Customer Data Entity\*\*:   
 - \*\*Description\*\*: Stores customer account information such as name, email, and password.   
 - \*\*Interaction Method\*\*: Data is added, modified, or retrieved through database queries initiated by the system during registration, login, and account management functions.   
  
- \*\*Product Data Entity\*\*:   
 - \*\*Description\*\*: Contains product details such as name, price, category, and inventory status.   
 - \*\*Interaction Method\*\*: Data is retrieved and displayed to customers during product browsing and search functions. Administrators can add, modify, or delete product records through the administrator interface.   
  
- \*\*Product Category Data Entity\*\*:   
 - \*\*Description\*\*: Stores information about product categories, including names and descriptions.   
 - \*\*Interaction Method\*\*: Categories are retrieved and displayed to customers during product browsing. Administrators can manage categories through the administrator interface.   
  
- \*\*Inventory Data Entity\*\*:   
 - \*\*Description\*\*: Tracks the stock levels of products.   
 - \*\*Interaction Method\*\*: Inventory data is updated automatically when customers add, modify, or remove items from their cart and when orders are placed or modified.   
  
- \*\*Shopping Cart Data Entity\*\*:   
 - \*\*Description\*\*: Stores the items selected by the customer for purchase, including product ID, quantity, and total price.   
 - \*\*Interaction Method\*\*: The cart is updated when customers add, modify, or remove items, and is cleared when the customer chooses to delete the cart.   
  
- \*\*Order Data Entity\*\*:   
 - \*\*Description\*\*: Stores order records, including customer information, product details, payment status, and order confirmation status.   
 - \*\*Interaction Method\*\*: Orders are created when a customer completes checkout. Administrators can update order status and initiate refunds.   
  
- \*\*Payment Data Entity\*\*:   
 - \*\*Description\*\*: Stores customer payment methods and payment records.   
 - \*\*Interaction Method\*\*: Payment data is updated when a customer places an order or modifies stored payment information. Administrators can review and modify payment records.   
  
- \*\*Contact Information Data Entity\*\*:   
 - \*\*Description\*\*: Stores customer contact details such as address and phone number.   
 - \*\*Interaction Method\*\*: Contact information is updated when a customer modifies or adds new contact details.   
  
- \*\*Plugin Data Entity\*\*:   
 - \*\*Description\*\*: Stores plugin information, including the plugin name, status, and installation timestamp.   
 - \*\*Interaction Method\*\*: Plugins are installed, activated, or uninstalled through the administrator interface, and the system logs these events.   
  
- \*\*PluginConfiguration Data Entity\*\*:   
 - \*\*Description\*\*: Stores configuration settings for installed plugins.   
 - \*\*Interaction Method\*\*: Administrators can configure or update plugin settings through the administrator interface, and the system updates the configuration accordingly.   
  
2.4 Communication Interface Output   
The system communicates with external services and users through various communication channels.   
  
- \*\*Email Notification Service\*\*:   
 - \*\*Description\*\*: Sends confirmation messages to customers after account registration, order placement, and payment processing.   
 - \*\*Interaction Method\*\*: The system sends an email to the customer's registered email address, including a confirmation message and order details.   
  
- \*\*Web Browsing Communication\*\*:   
 - \*\*Description\*\*: The system is accessed by customers and administrators through web browsers.   
 - \*\*Interaction Method\*\*: Customers and administrators interact with the system via HTTP/HTTPS protocols, with dynamic content loaded based on user actions.   
  
- \*\*Payment Gateway Integration\*\*:   
 - \*\*Description\*\*: Integrates with a third-party payment gateway to process customer payments.   
 - \*\*Interaction Method\*\*: The system sends payment method and transaction details to the payment gateway via API calls and receives a confirmation of payment status.   
  
- \*\*Restocking Alert Communication\*\*:   
 - \*\*Description\*\*: Sends alerts to administrators when inventory levels fall below a threshold.   
 - \*\*Interaction Method\*\*: Alerts are generated and sent via internal messaging or email when inventory levels require restocking.   
  
- \*\*Customer Order Status Notification\*\*:   
 - \*\*Description\*\*: Sends updates to customers regarding their order status.   
 - \*\*Interaction Method\*\*: Notifications are sent via email or in-system messages when an order is placed, confirmed, or modified by an administrator.   
  
All communication interfaces are designed to ensure secure and reliable interactions, with appropriate error handling and logging mechanisms in place.