# Functional Requirement

# 1. Functional Requirements  
  
## 1.1 Customer Registration Function   
Function ID: FR-01   
Description: Customers can register a new account by providing their name, email, and password. The system validates the email and password and sends a confirmation email.   
Input: Name, email, password, and optional contact details.   
Output: A successfully registered customer account and a confirmation email sent to the customer.  
  
## 1.2 Customer Login Function   
Function ID: FR-02   
Description: Customers can log in using their registered email and password. The system validates the credentials and logs the login activity.   
Input: Email and password.   
Output: A successful login session and the customer's dashboard or homepage.  
  
## 1.3 Customer Logout Function   
Function ID: FR-03   
Description: Customers can end their current session by logging out. The system clears session data and redirects the customer to the login or homepage.   
Input: Logout request from the customer.   
Output: Session cleared and the customer redirected to the login or homepage.  
  
## 1.4 View Product Information Function   
Function ID: FR-04   
Description: Customers can view detailed information about a product, including name, description, price, and availability. The system logs the request.   
Input: Product ID or search criteria.   
Output: Displayed product details and a logged request.  
  
## 1.5 Search Products Function   
Function ID: FR-05   
Description: Customers can search for products using keywords, categories, or other relevant criteria. The system retrieves matching products and logs the search activity.   
Input: Search query (e.g., name, category, keyword).   
Output: A list of matching products and a logged search activity.  
  
## 1.6 Add Product to Cart Function   
Function ID: FR-06   
Description: Customers can add a product to their cart, specifying the quantity. The system checks stock availability and logs the addition.   
Input: Product ID, quantity, and customer ID.   
Output: Updated cart with the added product and a confirmation message.  
  
## 1.7 Create Order Function   
Function ID: FR-07   
Description: Customers can create an order from their cart. The system validates the order, processes the payment, and logs the order creation.   
Input: Cart contents, shipping address, and selected payment method.   
Output: A new order record, updated product inventory, and an order confirmation email sent to the customer.  
  
## 1.8 Checkout Function   
Function ID: FR-08   
Description: Customers can complete the checkout process by confirming the order and payment. The system processes the payment and creates the order.   
Input: Cart contents, shipping address, and payment information.   
Output: A completed order, updated inventory, and an order confirmation email.  
  
## 1.9 Receive Order Confirmation Email Function   
Function ID: FR-09   
Description: The system sends an order confirmation email to the customer after a successful checkout.   
Input: Order details, including customer name, order ID, and total amount.   
Output: A confirmation email sent to the customer and a logged email activity.  
  
## 1.10 Update Order Status Function   
Function ID: FR-10   
Description: Administrators can update the status of an existing order. The system logs the update and may send a notification to the customer.   
Input: Order ID and new status (e.g., Processing, Shipped, Delivered, Cancelled).   
Output: Updated order status and a logged activity with optional email notification.  
  
## 1.11 View Order History Function   
Function ID: FR-11   
Description: Customers can view their past orders, including order details and status. The system retrieves and displays the order history and logs the access.   
Input: Customer ID.   
Output: A list of past orders with details and a logged access activity.  
  
## 1.12 Delete Order Function   
Function ID: FR-12   
Description: Customers can delete an order if it is in a cancellable status. The system verifies the status, deletes the order, and updates inventory if necessary.   
Input: Order ID and confirmation of deletion.   
Output: Deleted order record, updated inventory, and an optional confirmation email sent to the customer.  
  
## 1.13 Manage Product Inventory Function   
Function ID: FR-13   
Description: Administrators can manage product inventory, including adding, updating, or deleting products. The system logs the changes and updates the product database.   
Input: Product details (e.g., name, price, stock, description) and action (add, update, delete).   
Output: Updated product inventory and a logged activity.  
  
## 1.14 Add New Product Function   
Function ID: FR-14   
Description: Administrators can add new products to the system by providing product details. The system validates the data and updates the product database.   
Input: Product name, description, price, stock, and category.   
Output: A new product record and a confirmation message to the administrator.  
  
## 1.15 Update Product Details Function   
Function ID: FR-15   
Description: Administrators can update product details such as name, price, stock, or category. The system validates the data and updates the product record.   
Input: Product ID and updated product details.   
Output: Updated product record and a confirmation message to the administrator.  
  
## 1.16 Delete Product Function   
Function ID: FR-16   
Description: Administrators can delete a product if it is not part of any active or pending orders. The system verifies the deletion eligibility and logs the action.   
Input: Product ID and confirmation of deletion.   
Output: Deleted product record and a confirmation message to the administrator.  
  
## 1.17 Administrator Registration Function   
Function ID: FR-17   
Description: Administrators can register a new account by providing name, email, password, and role. The system validates the data and sends a confirmation email.   
Input: Name, email, password, and role.   
Output: A new administrator record and a confirmation email sent to the administrator.  
  
## 1.18 Administrator Login Function   
Function ID: FR-18   
Description: Administrators can log in using their registered email and password. The system validates the credentials and logs the login activity.   
Input: Email and password.   
Output: A successful login session and the administrator's dashboard or homepage.  
  
## 1.19 Manage Customer Accounts Function   
Function ID: FR-19   
Description: Administrators can view, update, or delete customer accounts. The system logs all actions and may send notifications to customers.   
Input: Customer ID and action (view, update, delete).   
Output: Updated or deleted customer record and a logged activity with optional email notification.  
  
## 1.20 Manage Orders Function   
Function ID: FR-20   
Description: Administrators can view, update, or delete orders. The system logs the changes and may send notifications to customers.   
Input: Order ID and action (view, update, delete).   
Output: Updated or deleted order record and a logged activity with optional email notification.  
  
## 1.21 View Payment Information Function   
Function ID: FR-21   
Description: Customers can view their payment history, including method, amount, and transaction date. The system retrieves and displays the information and logs the access.   
Input: Customer ID.   
Output: A list of payment records and a logged access activity.  
  
## 1.22 Manage Cart Function   
Function ID: FR-22   
Description: Customers can manage their shopping cart by adding, updating, or removing items. The system logs the cart modifications and updates the total.   
Input: Product ID, quantity, and action (add, update, remove).   
Output: Updated cart contents and a confirmation message.  
  
## 1.23 Manage Order Status Function   
Function ID: FR-23   
Description: Administrators can update the status of an order. The system logs the status change and may send a notification to the customer.   
Input: Order ID and new status.   
Output: Updated order status and a logged activity with optional email notification.  
  
## 1.24 Manage Payment Method Function   
Function ID: FR-24   
Description: Administrators can manage available payment methods, including adding, updating, or deleting a method. The system validates and logs the changes.   
Input: Payment method details (e.g., method name, description, configuration) and action (add, update, delete).   
Output: Updated payment method configuration and a confirmation message.  
  
## 1.25 Manage Email Settings Function   
Function ID: FR-25   
Description: Administrators can manage the email configuration, including server settings and templates. The system validates the input and logs the changes.   
Input: Email server settings (e.g., host, port, username, password) and action (update, edit, enable/disable).   
Output: Updated email configuration and a confirmation message.  
  
## 1.26 Add Plugin Function   
Function ID: FR-26   
Description: Administrators can add new plugins to the system. The system validates the plugin and logs the addition.   
Input: Plugin details (e.g., name, version, description) and plugin file or API configuration.   
Output: A new plugin record and a confirmation message to the administrator.  
  
## 1.27 Update Plugin Function   
Function ID: FR-27   
Description: Administrators can update plugin configurations. The system validates the changes and logs the update.   
Input: Plugin ID and updated configuration details.   
Output: Updated plugin configuration and a confirmation message.  
  
## 1.28 Delete Plugin Function   
Function ID: FR-28   
Description: Administrators can delete a plugin if it is not in use. The system verifies the deletion eligibility and logs the action.   
Input: Plugin ID and confirmation of deletion.   
Output: Deleted plugin record and a confirmation message.  
  
## 1.29 View Plugin Documentation Function   
Function ID: FR-29   
Description: Administrators can view documentation for a specific plugin. The system retrieves the documentation and logs the access.   
Input: Plugin ID.   
Output: Displayed plugin documentation and a logged access activity.  
  
## 1.30 Access API Specifications Function   
Function ID: FR-30   
Description: Administrators can view API specifications for plugins or system components. The system retrieves the documentation and logs the access.   
Input: API ID.   
Output: Displayed API documentation and a logged access activity.  
  
## 1.31 View Order Status Function   
Function ID: FR-31   
Description: Customers can view the current status of their orders. The system retrieves the status and logs the request.   
Input: Order ID.   
Output: Displayed order status and a logged access activity.

# External Description

# 2. External Interfaces   
  
This section describes the external interfaces of the system. These interfaces include user interfaces, hardware interfaces, software interfaces, and communication interfaces. The system interacts with these external interfaces to provide the required functionalities and ensure smooth operation.   
  
## 2.1 User Interface   
  
The system provides several user interfaces for both customers and administrators to interact with its functionalities. These interfaces are designed to be intuitive and user-friendly.   
  
- \*\*Customer Registration Interface\*\*:   
 - Description: A web-based interface where customers can input their name, email, and password to register a new account. Optional contact details can also be added.   
 - Interaction: The system validates the email and password format and sends a confirmation email.   
  
- \*\*Customer Login Interface\*\*:   
 - Description: A web-based interface that allows customers to log in using their registered email and password.   
 - Interaction: The system validates the credentials and logs the login activity.   
  
- \*\*Customer Logout Interface\*\*:   
 - Description: A web-based interface that allows customers to log out, ending their session.   
 - Interaction: The system clears session data and redirects the user to the login or homepage.   
  
- \*\*Product Information Interface\*\*:   
 - Description: A web-based interface displaying product details, such as name, description, price, and availability.   
 - Interaction: The system retrieves and displays product information based on the product ID or search criteria.   
  
- \*\*Product Search Interface\*\*:   
 - Description: A web-based interface where customers can search for products using keywords, categories, or other criteria.   
 - Interaction: The system retrieves matching products and logs the search activity.   
  
- \*\*Shopping Cart Interface\*\*:   
 - Description: A web-based interface where customers can manage their cart, including adding, updating, or removing items.   
 - Interaction: The system updates the cart contents and logs the modification.   
  
- \*\*Checkout Interface\*\*:   
 - Description: A web-based interface for customers to confirm their order and payment information.   
 - Interaction: The system processes the payment and creates the order.   
  
- \*\*Order History Interface\*\*:   
 - Description: A web-based interface where customers can view their past orders, including order status and details.   
 - Interaction: The system retrieves order history based on the customer ID and logs the access.   
  
- \*\*Payment Information Interface\*\*:   
 - Description: A web-based interface where customers can view their payment history, including method, amount, and transaction date.   
 - Interaction: The system retrieves and displays payment records and logs the access.   
  
- \*\*Order Status Interface\*\*:   
 - Description: A web-based interface for customers to view the current status of a specific order.   
 - Interaction: The system retrieves the order status based on the order ID and logs the request.   
  
- \*\*Administrator Dashboard Interface\*\*:   
 - Description: A web-based interface for administrators to manage products, orders, customers, plugins, and system settings.   
 - Interaction: The system retrieves and updates data based on administrative actions and logs these activities.   
  
- \*\*Plugin Management Interface\*\*:   
 - Description: A web-based interface where administrators can add, update, or delete plugins.   
 - Interaction: The system validates the plugin and logs the addition, update, or deletion.   
  
- \*\*API Specifications Interface\*\*:   
 - Description: A web-based interface where administrators can view API specifications for system components or plugins.   
 - Interaction: The system retrieves and displays the relevant API documentation and logs the access.   
  
## 2.2 Hardware Interface   
  
The system does not require direct interaction with any hardware devices. All functionalities are implemented in a software environment.   
  
## 2.3 Software Interface   
  
The system interacts with various software components and external systems to perform its functions.   
  
- \*\*Product Database\*\*:   
 - Description: A database storing product information, including product ID, name, description, price, stock, and category.   
 - Interaction: The system retrieves, adds, updates, and deletes product records as required by the functional requirements.   
 - Input/Output:   
 - Input: Product details (e.g., name, description, price, stock, category) and action (add, update, delete).   
 - Output: Updated or deleted product records.   
  
- \*\*Order Database\*\*:   
 - Description: A database storing order information, including order ID, customer ID, product details, shipping address, order status, and payment information.   
 - Interaction: The system retrieves, updates, and deletes order records as required by the functional requirements.   
 - Input/Output:   
 - Input: Order details (e.g., customer ID, product ID, quantity, shipping address, status).   
 - Output: Updated or deleted order records.   
  
- \*\*Customer Database\*\*:   
 - Description: A database storing customer information, including customer ID, name, email, password, and optional contact details.   
 - Interaction: The system retrieves, updates, and deletes customer records as required by the functional requirements.   
 - Input/Output:   
 - Input: Customer details (e.g., name, email, password, contact details) and action (add, update, delete).   
 - Output: Updated or deleted customer records.   
  
- \*\*Payment System\*\*:   
 - Description: A third-party software system for processing payments. The system interacts with this component to validate and process customer payments.   
 - Interaction: The system sends payment information (e.g., cart contents, payment method, amount) to the payment system and receives confirmation of payment success or failure.   
 - Input/Output:   
 - Input: Payment information (e.g., customer ID, payment method, total amount).   
 - Output: Payment confirmation or error message.   
  
- \*\*Email Server\*\*:   
 - Description: A software system responsible for sending and receiving email notifications. The system interacts with this component to send confirmation emails to customers and administrators.   
 - Interaction: The system sends order confirmation emails, account confirmation emails, and other notifications to the email server, which then delivers the emails to the appropriate recipients.   
 - Input/Output:   
 - Input: Email content (e.g., recipient email address, message body, subject).   
 - Output: Confirmation that the email was sent successfully.   
  
- \*\*Plugin Management System\*\*:   
 - Description: A software component that allows administrators to manage plugins by adding, updating, or deleting them.   
 - Interaction: The system validates the plugin details (e.g., name, version, description) and configuration, and logs the changes.   
 - Input/Output:   
 - Input: Plugin details (e.g., name, version, description) and action (add, update, delete).   
 - Output: Updated or deleted plugin records.   
  
- \*\*Authentication System\*\*:   
 - Description: A software system that handles user authentication for both customers and administrators.   
 - Interaction: The system validates user credentials (e.g., email and password) against the authentication system and logs login activity.   
 - Input/Output:   
 - Input: Email and password.   
 - Output: Authentication result (success or failure) and session creation.   
  
## 2.4 Communication Interface   
  
The system communicates with external entities through network-based protocols and messaging systems.   
  
- \*\*Email Communication Interface\*\*:   
 - Description: The system uses an email communication interface to send confirmation emails to customers and administrators.   
 - Interaction: The system sends email content (e.g., order confirmation, account confirmation) to the email server via SMTP or another email protocol.   
 - Input/Output:   
 - Input: Order details (e.g., customer name, order ID, total amount) or account details (e.g., email, password).   
 - Output: Confirmation that the email has been sent to the intended recipient.   
  
- \*\*Web Communication Interface\*\*:   
 - Description: The system uses HTTP/HTTPS protocols to communicate with web clients (e.g., browsers) and web services.   
 - Interaction: The system receives user inputs (e.g., search queries, login requests) via HTTP/HTTPS and sends responses (e.g., product lists, dashboard content) in JSON or HTML format.   
 - Input/Output:   
 - Input: Web requests containing user inputs (e.g., search query, login credentials).   
 - Output: Web responses containing system outputs (e.g., product details, order confirmation).   
  
- \*\*API Communication Interface\*\*:   
 - Description: The system provides and consumes APIs to interact with external components (e.g., payment gateways, email servers).   
 - Interaction: The system sends and receives data in JSON or XML format through RESTful APIs.   
 - Input/Output:   
 - Input: API requests containing data (e.g., product details, order status updates).   
 - Output: API responses containing results (e.g., updated inventory, confirmation messages).   
  
- \*\*Logging and Monitoring System\*\*:   
 - Description: The system communicates with a logging and monitoring service to record activity logs, errors, and performance metrics.   
 - Interaction: The system sends logs in a structured format (e.g., JSON) to the logging system for storage and analysis.   
 - Input/Output:   
 - Input: Log data (e.g., action performed, user ID, timestamp).   
 - Output: Log confirmation or error status from the logging system.   
  
## 2.5 Summary of External Interfaces   
  
| Interface Type | Interface Name | Description | Communication Method |   
|----------------|----------------|-------------|----------------------|   
| User Interface | Customer Registration Interface | Allows customers to register a new account | Web-based form submission |   
| User Interface | Customer Login Interface | Allows customers to log in with their email and password | Web-based form submission |   
| User Interface | Shopping Cart Interface | Allows customers to manage their cart | Web-based form submission and updates |   
| Software Interface | Product Database | Stores and retrieves product information | SQL queries or ORM methods |   
| Software Interface | Order Database | Stores and retrieves order information | SQL queries or ORM methods |   
| Software Interface | Payment System | Processes customer payments | REST API or direct integration |   
| Communication Interface | Email Server | Sends and receives confirmation emails | SMTP or other email protocols |   
| Communication Interface | Web Communication | Handles user requests via web browsers | HTTP/HTTPS protocols |   
| Communication Interface | Logging and Monitoring System | Logs system activities for debugging and auditing | REST API or message queues |   
  
This section ensures that all external data sources and interfaces referenced in the functional requirements are clearly defined and categorized, providing developers and stakeholders with a comprehensive understanding of the system's external interactions.