项目文档

# Functional Requirement

ID Function Requirement  
ACCT-CREATE-001 Account Creation The system shall allow customers to create an account by providing an email address and password.  
ACCT-CREATE-002 Account Creation The system shall collect a shipping address during account creation to be used for future orders.  
ACCT-CREATE-003 Account Creation The system shall optionally allow customers to provide a phone number for verification purposes.  
ACCT-CREATE-004 Account Creation The system shall provide a phone verification step if the customer chooses to enter their phone number.  
PAYMENT-METHOD-001 Payment Management The system shall support multiple payment methods, including credit card, PayPal, Apple Pay, and Google Pay.  
PAYMENT-METHOD-002 Payment Management The system shall allow customers to save multiple payment methods with associated billing addresses.  
PAYMENT-METHOD-003 Payment Management The system shall display saved payment methods in the account settings and during checkout.  
PAYMENT-METHOD-004 Payment Management The system shall allow customers to edit or delete stored payment methods.  
PAYMENT-METHOD-005 Payment Management The system shall pre-validate payment information during checkout to avoid processing errors.  
PAYMENT-METHOD-006 Payment Management The system shall provide the ability to set expiration dates or receive notifications for expiring payment methods.  
PAYMENT-METHOD-007 Payment Management The system shall maintain an audit log or activity history showing when and where a payment method was used.  
CHECKOUT-REVIEW-001 Checkout Process The system shall allow customers to review their cart before proceeding to checkout.  
CHECKOUT-VALIDATION-001 Checkout Process The system shall provide real-time shipping address validation using an address lookup tool.  
CHECKOUT-DELIVERY-001 Checkout Process The system shall allow customers to select delivery options (e.g., standard, express) and display estimated delivery times.  
CHECKOUT-SUMMARY-001 Checkout Process The system shall display a checkout summary that includes the list of items, itemized pricing, shipping cost, and total amount.  
CHECKOUT-EDIT-001 Checkout Process The system shall allow customers to make last-minute changes to their cart or shipping/payment details before finalizing the purchase.  
CHECKOUT-PROCESS-001 Checkout Process The system shall process the payment and provide a confirmation after the transaction is successful.  
CHECKOUT-EMAIL-001 Checkout Process The system shall send a confirmation email with order details and tracking information (if available).  
EMAIL-CONFIRMATION-001 Email Confirmation The system shall generate an order confirmation email that includes the order number, summary of items, total amount paid, and estimated delivery date.  
EMAIL-CONFIRMATION-002 Email Confirmation The system shall include a secure, one-time link in the confirmation email to view the order online.  
EMAIL-CONFIRMATION-003 Email Confirmation The system shall ensure that sensitive information such as full card numbers or addresses is not exposed in the confirmation email.

# External Description

## 5.1 Regulatory/Legal Constraints  
  
- \*\*C-REG-001\*\*: The system shall comply with the Payment Card Industry Data Security Standard (PCI DSS) for handling payment card information.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: Compliance with PCI DSS is required to ensure secure handling of payment data and to avoid legal and financial penalties.   
 \*\*Source\*\*: NFR-7 (Security Environment)   
 \*\*Acceptance Criteria\*\*: The system shall pass a PCI DSS compliance audit, and no raw credit card data shall be stored.  
  
- \*\*C-REG-002\*\*: The system shall implement role-based access control (RBAC) to restrict access to administrative functions and audit logs.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: RBAC is a standard practice for securing internal access and ensuring that only authorized personnel can perform sensitive operations.   
 \*\*Source\*\*: NFR-7 (Security Environment)   
 \*\*Acceptance Criteria\*\*: The system shall enforce RBAC policies during login and function access, and no unauthorized user shall be able to access administrative controls.  
  
- \*\*C-REG-003\*\*: The system shall not store full card numbers and shall only retain masked or tokenized versions of payment information.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: Storing full card numbers is a violation of data protection regulations and increases the risk of data breaches.   
 \*\*Source\*\*: NFR-4 (Security)   
 \*\*Acceptance Criteria\*\*: The system shall not display or store full credit card numbers in any form, including in audit logs or emails.  
  
- \*\*C-REG-004\*\*: The system shall ensure that all sensitive information, such as full addresses and payment details, is not exposed in emails.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: Exposure of sensitive information in emails violates privacy policies and may lead to legal consequences.   
 \*\*Source\*\*: NFR-7 (Security)   
 \*\*Acceptance Criteria\*\*: The system shall send order confirmation emails that do not include full card numbers or unmasked addresses.  
  
## 5.2 Hardware Constraints  
  
- \*\*C-HARD-001\*\*: The system shall be hosted on a scalable cloud infrastructure (e.g., AWS, Azure, or Google Cloud).   
 \*\*Priority\*\*: Should Have   
 \*\*Rationale\*\*: Cloud hosting ensures flexibility and scalability to handle traffic fluctuations and maintain uptime.   
 \*\*Source\*\*: Operating Environment (Hardware)   
 \*\*Acceptance Criteria\*\*: The system shall be deployed on a cloud platform and demonstrate auto-scaling and load-balancing capabilities.  
  
- \*\*C-HARD-002\*\*: The minimum server configuration shall include 8-core CPU, 16 GB RAM, and SSD storage.   
 \*\*Priority\*\*: Should Have   
 \*\*Rationale\*\*: Minimum server configuration ensures that the system can handle expected workloads efficiently and maintain acceptable performance.   
 \*\*Source\*\*: Operating Environment (Hardware)   
 \*\*Acceptance Criteria\*\*: The system shall be deployed on servers with at least 8-core CPU, 16 GB RAM, and SSD storage, and shall perform as expected under standard loads.  
  
## 5.3 Interface Constraints  
  
- \*\*C-INT-001\*\*: The system shall support the latest versions of major web browsers (Chrome, Firefox, Safari, Edge).   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: Supporting the latest browsers ensures compatibility and a consistent user experience across platforms.   
 \*\*Source\*\*: Operating Environment (Software)   
 \*\*Acceptance Criteria\*\*: The system shall be fully functional in the latest versions of Chrome, Firefox, Safari, and Edge, with no known compatibility issues.  
  
- \*\*C-INT-002\*\*: The system shall integrate with external services for address validation and payment processing (e.g., postal APIs, Stripe, PayPal).   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: Integration with third-party services is essential to validate addresses and process payments securely.   
 \*\*Source\*\*: Operating Environment (Third-Party Tools)   
 \*\*Acceptance Criteria\*\*: The system shall successfully call and respond to address validation and payment processing APIs without data loss or integrity issues.  
  
- \*\*C-INT-003\*\*: The system shall use HTTPS for all communication to ensure secure data transmission.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: HTTPS is a fundamental security requirement for any system handling sensitive data.   
 \*\*Source\*\*: Operating Environment (Network)   
 \*\*Acceptance Criteria\*\*: All pages and API endpoints shall use HTTPS, and the system shall not allow unencrypted HTTP connections.  
  
## 5.4 Design & Implementation Constraints  
  
- \*\*C-DESIGN-001\*\*: The system shall use a relational database (e.g., PostgreSQL or MySQL) for storing user and payment data.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: Relational databases are the most suitable for structured data and ensure data consistency and integrity.   
 \*\*Source\*\*: Operating Environment (Software)   
 \*\*Acceptance Criteria\*\*: The system shall be implemented with a relational database, and all user and payment data shall be stored in normalized tables.  
  
- \*\*C-DESIGN-002\*\*: The system shall be designed to operate over standard internet connections with no special hardware requirements.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: This ensures accessibility for all users, regardless of their network or device capabilities.   
 \*\*Source\*\*: Operating Environment (Network)   
 \*\*Acceptance Criteria\*\*: The system shall function correctly on standard internet connections and shall not require specialized hardware for operation.  
  
- \*\*C-DESIGN-003\*\*: The system shall not include any direct dependencies on legacy systems or platforms.   
 \*\*Priority\*\*: Should Have   
 \*\*Rationale\*\*: Legacy dependencies can hinder system scalability, maintainability, and security.   
 \*\*Source\*\*: N/A (Derived from general system modernization goals)   
 \*\*Acceptance Criteria\*\*: All integrations and dependencies shall be based on modern APIs and services, and no legacy code or systems shall be used in the implementation.  
  
## 5.5 Other Constraints  
  
- \*\*C-OTHER-001\*\*: The system shall use an ID scheme in the format `<Module>-<Function>-NNN` for all requirement and constraint IDs.   
 \*\*Priority\*\*: Must Have   
 \*\*Rationale\*\*: A consistent ID scheme ensures traceability and ease of reference across the SRS and test documentation.   
 \*\*Source\*\*: Internal documentation standard   
 \*\*Acceptance Criteria\*\*: All requirements and constraints shall follow the `<Module>-<Function>-NNN` format, and no deviation shall be allowed without explicit approval.  
  
- \*\*C-OTHER-002\*\*: The system shall maintain bidirectional traceability between requirements and test cases.   
 \*\*Priority\*\*: Should Have   
 \*\*Rationale\*\*: Traceability is essential for verifying that all system requirements are tested and for impact analysis during changes.   
 \*\*Source\*\*: BABOK v3 (Traceability)   
 \*\*Acceptance Criteria\*\*: A traceability matrix shall be maintained, and all requirements shall have at least one corresponding test case ID.