PRODUCT REQUIREMENTS DOCUMENT

E-Commerce Checkout System

Version 2.1

Date: November 2024

1. EXECUTIVE SUMMARY

This document outlines the requirements for a comprehensive e-commerce checkout system that enables customers to purchase products online. The system must support multiple payment methods, shipping options, order management, and provide a seamless user experience across web and mobile platforms.

2. BUSINESS OBJECTIVES

• Increase online sales conversion rate by 25%

• Reduce cart abandonment by 30%

• Support multiple payment gateways for global reach

• Provide real-time inventory management

• Enable order tracking and customer notifications

3. FUNCTIONAL REQUIREMENTS

3.1 Shopping Cart Management

3.1.1 Add to Cart

• Users must be able to add products to cart from:

• Product detail pages

• Product listing pages

• Search results pages

• System must validate product availability before adding to cart

• If product is out of stock, display clear message: "This item is currently unavailable"

• Cart must persist across browser sessions (use cookies/localStorage)

- Maximum 50 items per cart
- Cart must show item count badge in header

3.1.2 Cart Viewing and Modification

- Users must be able to:
- View all items in cart with product image, name, price, quantity
- Update quantity (minimum 1, maximum based on stock availability)
- Remove items from cart
- Apply discount codes/promo codes
- See subtotal, tax, shipping cost, and total price
- Cart must update in real-time when quantities change
- If item becomes unavailable while in cart, show warning with option to remove

3.1.3 Cart Validation

- System must validate cart contents before checkout:
- All items must still be in stock
- Prices must match current product prices
- Discount codes must be valid and not expired
- If validation fails, show specific error messages and allow user to update cart

3.2 Checkout Process

3.2.1 Checkout Initiation

- Users must click "Proceed to Checkout" button from cart page
- Guest checkout must be available (no account required)
- Registered users can checkout faster with saved addresses
- System must require email address for order confirmation

3.2.2 Shipping Information

- Users must provide:
- Full name (required, minimum 2 characters)

• Email address (required, valid format)

• Phone number (required, international format)

• Shipping address:

• Street address (required)

• City (required)

• State/Province (required for applicable countries)

• Postal/ZIP code (required)

• Country (required, dropdown selection)

• Address validation must occur in real-time using postal service API

• Users can save multiple addresses (registered users only)

• Users can select "Same as billing" checkbox

3.2.3 Shipping Method Selection

• System must display available shipping options based on:

• Shipping address

• Cart weight and dimensions

• Delivery date preferences

• Shipping options must include:

• Standard shipping (5-7 business days, $5.99)

• Express shipping (2-3 business days, $12.99)

• Overnight shipping (next business day, $24.99)

• Free shipping (for orders over $50)

• Estimated delivery date must be shown for each option

• Shipping cost must be calculated and displayed before payment

3.2.4 Payment Information

• System must support multiple payment methods:

• Credit/Debit Cards (Visa, Mastercard, Amex, Discover)

• PayPal

• Apple Pay

• Google Pay

• Bank Transfer (for orders over $500)

• For card payments, users must provide:

• Card number (16 digits, validated with Luhn algorithm)

• Cardholder name (required)

• Expiration date (MM/YY format, must not be expired)

• CVV (3-4 digits, required)

• Billing address (can be same as shipping)

• Card validation must occur before form submission

• System must use PCI-compliant payment gateway (Stripe/PayPal)

• Payment information must never be stored on our servers

3.2.5 Order Review

• Before final submission, users must see complete order summary:

• All items with quantities and prices

• Shipping address

• Shipping method and cost

• Payment method (last 4 digits for cards)

• Subtotal, tax, shipping, discounts, and final total

• Users must check "I agree to terms and conditions" checkbox

• Users must click "Place Order" button to complete purchase

3.2.6 Order Confirmation

• Upon successful order placement:

• Display order confirmation page with order number

• Send confirmation email to user's email address

• Send notification to admin/system

• Update inventory levels

• Create order record in database

• Order number must be unique and format: ORD-YYYYMMDD-XXXXX

• Confirmation email must include:

• Order number

- Order date and time

- Itemized list of products

- Shipping address

- Tracking information (when available)

- Estimated delivery date

3.3 Payment Processing

3.3.1 Payment Authorization

- System must authorize payment before order creation

- Authorization must occur within 10 seconds

- If authorization fails:

- Show user-friendly error message

- Do not create order

- Allow user to retry with different payment method

- Common failure scenarios:

- Insufficient funds: "Payment declined. Please check your account balance."

- Invalid card: "Card information is invalid. Please verify and try again."

- Expired card: "Card has expired. Please use a different payment method."

- Network error: "Payment processing temporarily unavailable. Please try again."

3.3.2 Payment Capture

- For credit cards: capture payment immediately upon order confirmation

- For PayPal: capture payment when order ships

- For bank transfer: mark order as "pending payment"

- System must handle partial captures for split shipments

- Failed captures must trigger order cancellation and notification

3.4 Order Management

3.4.1 Order Status Tracking

• Orders must have the following statuses:

• Pending Payment

• Payment Received

• Processing

• Shipped

• Delivered

• Cancelled

• Refunded

• Status updates must trigger email notifications to customer

• Customers must be able to view order status in their account or via order number lookup

3.4.2 Order Cancellation

• Customers can cancel orders within 24 hours of placement (if not yet shipped)

• Cancellation must:

• Refund payment (if already captured)

• Restore inventory

• Send cancellation confirmation email

• Update order status to "Cancelled"

• Admin can cancel orders at any time with reason

3.4.3 Order Modification

• Customers cannot modify orders after placement

• Admin can modify:

• Shipping address (before shipment)

• Shipping method (before shipment)

• Add/remove items (requires re-calculation and customer approval)

4. NON-FUNCTIONAL REQUIREMENTS

4.1 Performance

• Cart page must load within 2 seconds

- Checkout page must load within 3 seconds

- Payment processing must complete within 10 seconds

- Order confirmation must display within 5 seconds of payment success

- System must handle 1000 concurrent checkout sessions

4.2 Security

- All payment data must be encrypted in transit (HTTPS/TLS 1.3)

- Payment information must never be logged or stored

- PCI DSS Level 1 compliance required

- Session tokens must expire after 30 minutes of inactivity

- CSRF protection on all form submissions

- Rate limiting: 5 checkout attempts per minute per IP

4.3 Usability

- Checkout process must be completable in under 5 minutes

- Form validation must provide real-time feedback

- Error messages must be clear and actionable

- Mobile-responsive design required

- Support for screen readers (WCAG 2.1 AA compliance)

4.4 Reliability

- System uptime must be 99.9%

- Payment gateway integration must have automatic failover

- Order data must be backed up every 6 hours

- Transaction logs must be retained for 7 years

5. EDGE CASES AND ERROR HANDLING

5.1 Inventory Conflicts

- If item goes out of stock during checkout:

- Show warning message

• Remove item from cart automatically

• Allow user to continue with remaining items or cancel

• If multiple users try to purchase last item simultaneously:

• First successful payment wins

• Others receive "Item no longer available" message

5.2 Payment Failures

• Network timeout during payment:

• Retry up to 3 times automatically

• If all retries fail, show error and allow manual retry

• Partial payment failure (split payment):

• Roll back entire transaction

• Notify user and admin

• Do not create order

5.3 Shipping Address Issues

• Invalid postal code:

• Show validation error

• Suggest correct format based on country

• International shipping restrictions:

• Show message: "We do not ship to this location"

• Suggest alternative (if available) or remove shipping option

5.4 Session Expiration

• If user session expires during checkout:

• Save cart contents

• Redirect to login/guest checkout page

• Restore cart when user returns

6. INTEGRATIONS

6.1 Payment Gateways

- Stripe (primary)
- PayPal (secondary)
- Apple Pay SDK
- Google Pay SDK

6.2 Shipping Providers

- FedEx API

- UPS API

- USPS API

- DHL API (international)

6.3 Address Validation

- Google Maps Geocoding API
- SmartyStreets API

6.4 Email Service

- SendGrid for transactional emails
- Email templates for:
- Order confirmation
- Shipping notification
- Delivery confirmation
- Cancellation notice

7. SUCCESS METRICS

- Checkout completion rate: Target 70%
- Average checkout time: Target under 4 minutes
- Payment success rate: Target 98%
- Cart abandonment rate: Target below 60%

• Customer satisfaction score: Target 4.5/5

8. FUTURE ENHANCEMENTS (Out of Scope for MVP)

• Subscription/recurring orders

• Gift cards and store credit

• Multi-currency support

• Split payments (multiple cards)

• Buy now, pay later options

• One-click checkout for returning customers