

Juice Shop Application Test Plan

1. Test Plan Overview

This comprehensive test plan addresses both functional and security aspects of the OWASP Juice Shop application. The plan is structured in a hierarchical manner with test plans containing test suites, which in turn contain test cases.

1.1 Test Objectives

- Verify functional correctness of the Juice Shop application
- Identify security vulnerabilities and validate security controls
- Ensure user interface is responsive and accessible
- Validate API functionality and security

1.2 Test Scope

- **In Scope:** User management, product management, shopping functionality, security features, API endpoints, UI components
- **Out of Scope:** Performance testing, load testing, penetration testing (beyond basic security tests)

1.3 Test Environment

- Test environment should mirror production configuration
- Required browsers: Chrome, Firefox, Safari, Edge (latest versions)
- Mobile device testing: iOS and Android devices/emulators
- Testing tools: Postman/Insomnia for API testing, OWASP ZAP for security testing

1.4 Test Schedule

- **Phase 1:** Functional Testing (Weeks 1-2)
- **Phase 2:** Security Testing (Weeks 3-4)
- **Phase 3:** UI/UX Testing (Week 5)
- **Phase 4:** Regression Testing (Week 6)

1.5 Test Prioritization

Test cases are prioritized using the following criteria:

- **P1:** Critical path functionality and high-risk security areas
- **P2:** Important features and medium-risk security areas
- **P3:** Minor features and low-risk security areas

2. Test Plans, Suites, and Cases

TP-01: User Management Test Plan

TS-UM-01: User Registration Test Suite

- **TC-UM-01-01:** User Registration - Valid Data (P1)
- **TC-UM-01-02:** User Registration - Email Already Exists (P1)
- **TC-UM-01-03:** User Registration - Password Complexity Requirements (P2)
- **TC-UM-01-04:** User Registration - Field Validations (P2)
- **TC-UM-01-05:** User Registration - Security Question Selection (P3)

TS-UM-02: User Authentication Test Suite

- **TC-UM-02-01:** User Login - Valid Credentials (P1)
- **TC-UM-02-02:** User Login - Invalid Credentials (P1)
- **TC-UM-02-03:** User Login - Account Lockout (P1)
- **TC-UM-02-04:** User Login - Remember Me Functionality (P2)
- **TC-UM-02-05:** User Logout - Session Termination (P1)

TS-UM-03: Password Management Test Suite

- **TC-UM-03-01:** Password Reset - Valid Security Answer (P1)
- **TC-UM-03-02:** Password Reset - Invalid Security Answer (P1)
- **TC-UM-03-03:** Password Change - Valid Current Password (P2)
- **TC-UM-03-04:** Password Change - Invalid Current Password (P2)
- **TC-UM-03-05:** Password Security - Password History Enforcement (P3)

TS-UM-04: User Profile Test Suite

- **TC-UM-04-01:** Profile Update - Personal Information (P2)
- **TC-UM-04-02:** Profile Update - Address Management (P2)
- **TC-UM-04-03:** Profile Update - Security Settings (P2)
- **TC-UM-04-04:** Profile Picture Upload - Valid Image (P3)
- **TC-UM-04-05:** Profile Picture Upload - Invalid File Type (P3)

TP-02: Product Management Test Plan

TS-PM-01: Product Browsing Test Suite

- **TC-PM-01-01:** Product Listing - Default View (P1)
- **TC-PM-01-02:** Product Listing - Pagination (P2)
- **TC-PM-01-03:** Product Listing - Filtering (P2)
- **TC-PM-01-04:** Product Listing - Sorting (P2)
- **TC-PM-01-05:** Product Listing - Category Navigation (P2)

TS-PM-02: Product Details Test Suite

- **TC-PM-02-01:** Product Details - Information Display (P1)
- **TC-PM-02-02:** Product Details - Image Gallery (P3)
- **TC-PM-02-03:** Product Details - Related Products (P3)
- **TC-PM-02-04:** Product Details - Availability Status (P2)
- **TC-PM-02-05:** Product Details - Add to Basket (P1)

TS-PM-03: Product Search Test Suite

- **TC-PM-03-01:** Product Search - Valid Term (P1)
- **TC-PM-03-02:** Product Search - No Results (P2)
- **TC-PM-03-03:** Product Search - Special Characters (P2)
- **TC-PM-03-04:** Product Search - SQL Injection Prevention (P1)
- **TC-PM-03-05:** Product Search - Performance with Large Result Set (P3)

TS-PM-04: Product Reviews Test Suite

- **TC-PM-04-01:** Product Reviews - Add Review (P2)
- **TC-PM-04-02:** Product Reviews - Edit Review (P3)
- **TC-PM-04-03:** Product Reviews - Delete Review (P3)
- **TC-PM-04-04:** Product Reviews - Rating System (P2)
- **TC-PM-04-05:** Product Reviews - XSS Prevention (P1)

TP-03: Shopping Functionality Test Plan

TS-SF-01: Shopping Basket Test Suite

- **TC-SF-01-01:** Add Item to Basket (P1)
- **TC-SF-01-02:** Update Item Quantity in Basket (P1)
- **TC-SF-01-03:** Remove Item from Basket (P1)
- **TC-SF-01-04:** Basket Persistence Across Sessions (P2)
- **TC-SF-01-05:** Basket Item Stock Validation (P2)

TS-SF-02: Checkout Process Test Suite

- **TC-SF-02-01:** Checkout Process - Address Selection (P1)
- **TC-SF-02-02:** Checkout Process - Shipping Method Selection (P1)
- **TC-SF-02-03:** Checkout Process - Payment Information (P1)
- **TC-SF-02-04:** Checkout Process - Order Review (P1)
- **TC-SF-02-05:** Checkout Process - Order Confirmation (P1)

TS-SF-03: Order Management Test Suite

- **TC-SF-03-01:** Order History - List View (P2)
- **TC-SF-03-02:** Order History - Order Details (P2)
- **TC-SF-03-03:** Order Tracking - Status Updates (P3)
- **TC-SF-03-04:** Order Cancellation - Within Time Window (P2)
- **TC-SF-03-05:** Reorder Functionality - From Order History (P3)

TS-SF-04: Payment Processing Test Suite

- **TC-SF-04-01:** Payment Processing - Credit Card (P1)
- **TC-SF-04-02:** Payment Processing - Alternative Methods (P2)
- **TC-SF-04-03:** Payment Processing - Validation Errors (P1)
- **TC-SF-04-04:** Payment Processing - Receipt Generation (P2)
- **TC-SF-04-05:** Payment Processing - Failed Transaction Handling (P1)

TP-04: Security Testing Test Plan

TS-SEC-01: Authentication Security Test Suite

- **TC-SEC-AUTH-01:** SQL Injection in Login Form (P1)
- **TC-SEC-AUTH-02:** Brute Force Protection (P1)
- **TC-SEC-AUTH-03:** Session Fixation Protection (P1)
- **TC-SEC-AUTH-04:** Remember Me Functionality Security (P2)
- **TC-SEC-AUTH-05:** Password Reset Token Security (P1)

TS-SEC-02: Authorization Security Test Suite

- **TC-SEC-AUTHZ-01:** Vertical Privilege Escalation (P1)
- **TC-SEC-AUTHZ-02:** Horizontal Privilege Escalation (P1)
- **TC-SEC-AUTHZ-03:** Insecure Direct Object References (P1)
- **TC-SEC-AUTHZ-04:** Missing Function Level Access Control (P1)
- **TC-SEC-AUTHZ-05:** CSRF Protection (P1)

TS-SEC-03: Input Validation Test Suite

- **TC-SEC-INPUT-01:** XSS in Product Reviews (P1)
- **TC-SEC-INPUT-02:** XSS in Search Field (P1)
- **TC-SEC-INPUT-03:** Server-Side Request Forgery (P1)
- **TC-SEC-INPUT-04:** Command Injection (P1)
- **TC-SEC-INPUT-05:** XML External Entity Injection (P1)

TS-SEC-04: Data Protection Test Suite

- **TC-SEC-DATA-01:** Sensitive Data in HTML Source (P1)
- **TC-SEC-DATA-02:** Secure Transmission of Credentials (P1)
- **TC-SEC-DATA-03:** Password Storage Security (P1)
- **TC-SEC-DATA-04:** Error Handling and Information Leakage (P2)
- **TC-SEC-DATA-05:** Secure File Upload (P1)

TS-SEC-05: Business Logic Security Test Suite

- **TC-SEC-LOGIC-01:** Price Manipulation (P1)
- **TC-SEC-LOGIC-02:** Quantity Manipulation (P1)
- **TC-SEC-LOGIC-03:** Coupon/Discount Abuse (P2)
- **TC-SEC-LOGIC-04:** Order Process Sequence Bypass (P2)
- **TC-SEC-LOGIC-05:** Race Condition in Inventory (P2)

TS-SEC-06: Client-Side Security Test Suite

- **TC-SEC-CLIENT-01:** DOM-Based XSS (P1)
- **TC-SEC-CLIENT-02:** Clickjacking Protection (P2)
- **TC-SEC-CLIENT-03:** Cross-Origin Resource Sharing Security (P2)
- **TC-SEC-CLIENT-04:** Content Security Policy Effectiveness (P2)
- **TC-SEC-CLIENT-05:** Sensitive Data in Local Storage (P1)

TP-05: API Testing Test Plan

TS-API-01: Product API Test Suite

- **TC-API-01-01:** Get All Products (P1)
- **TC-API-01-02:** Get Product by ID (P1)
- **TC-API-01-03:** Search Products (P2)
- **TC-API-01-04:** Product Filtering (P2)
- **TC-API-01-05:** Product API Error Handling (P2)

TS-API-02: User API Test Suite

- **TC-API-02-01:** User Registration API (P1)
- **TC-API-02-02:** User Authentication API (P1)
- **TC-API-02-03:** User Profile API (P2)
- **TC-API-02-04:** Password Reset API (P2)
- **TC-API-02-05:** User API Authentication Requirements (P1)

TS-API-03: Basket API Test Suite

- **TC-API-03-01:** Add Item to Basket API (P1)
- **TC-API-03-02:** Update Basket Item API (P1)
- **TC-API-03-03:** Remove Basket Item API (P1)
- **TC-API-03-04:** Get Basket Contents API (P1)
- **TC-API-03-05:** Basket API Authentication Requirements (P1)

TS-API-04: Order API Test Suite

- **TC-API-04-01:** Create Order API (P1)
- **TC-API-04-02:** Get Order History API (P2)
- **TC-API-04-03:** Get Order Details API (P2)
- **TC-API-04-04:** Cancel Order API (P2)
- **TC-API-04-05:** Order API Authentication Requirements (P1)

TP-06: UI Testing Test Plan

TS-UI-01: Responsive Design Test Suite

- **TC-UI-01-01:** Desktop Layout (P1)
- **TC-UI-01-02:** Tablet Layout (P2)
- **TC-UI-01-03:** Mobile Layout (P1)
- **TC-UI-01-04:** Orientation Change Handling (P2)
- **TC-UI-01-05:** Dynamic Content Resizing (P3)

TS-UI-02: Form Validation Test Suite

- **TC-UI-02-01:** Required Field Validation (P1)
- **TC-UI-02-02:** Email Format Validation (P1)
- **TC-UI-02-03:** Password Strength Indicator (P2)
- **TC-UI-02-04:** Error Message Display (P2)
- **TC-UI-02-05:** Form Submission Feedback (P2)

TS-UI-03: Navigation Test Suite

- **TC-UI-03-01:** Main Navigation Menu (P1)
- **TC-UI-03-02:** Breadcrumb Navigation (P3)
- **TC-UI-03-03:** Footer Links (P3)
- **TC-UI-03-04:** User Menu Navigation (P2)
- **TC-UI-03-05:** Product Category Navigation (P2)

TS-UI-04: Accessibility Test Suite

- **TC-UI-04-01:** Screen Reader Compatibility (P2)
- **TC-UI-04-02:** Keyboard Navigation (P2)
- **TC-UI-04-03:** Color Contrast Compliance (P2)
- **TC-UI-04-04:** Alt Text for Images (P2)
- **TC-UI-04-05:** Form Label Associations (P2)

3. Test Execution Strategy

3.1 Test Execution Prioritization

1. **First Priority:** Critical functionality and P1 security tests
 - User authentication and authorization
 - Shopping basket and checkout flow
 - High-risk security vulnerabilities
2. **Second Priority:** Core business functionality and P2 security tests
 - Product browsing and search
 - User profile management
 - Order management
 - Medium-risk security tests
3. **Third Priority:** Enhanced features and P3 security tests
 - Reviews and ratings
 - UI components and accessibility
 - Low-risk security tests

3.2 Regression Testing Strategy

- Automated regression suite to cover P1 test cases
- Manual testing for complex security scenarios
- Daily regression of critical paths
- Full regression before release

3.3 Defect Management

- **Critical:** Must be fixed immediately, blocks testing
- **High:** Must be fixed before release
- **Medium:** Should be fixed before release if possible
- **Low:** Can be deferred to future releases

4. Testing Tools and Resources

4.1 Testing Tools

- **Functional Testing:** Selenium, Cypress
- **API Testing:** Postman, Jest
- **Security Testing:** OWASP ZAP, Burp Suite
- **Accessibility Testing:** axe, WAVE

4.2 Test Data Management

- Test users with different roles and permissions