

# **Day 5 Report - Testing, Error Handling, and Backend Integration Refinement**

**Project Name:** Furniture Web – Marketplace

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## **Objective**

Day 5 focuses on ensuring that the **Furniture Web** marketplace is ready for deployment by conducting thorough testing, optimizing its performance, implementing error handling, and documenting results. The primary goal is to validate the functionality and user experience, ensuring a robust and scalable product.

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## **Key Learning Outcomes**

1. **Functional Testing:** Ensure that the main features of the marketplace work seamlessly.
  2. **Error Handling:** Implement comprehensive error handling for smooth user experience.
  3. **Performance Optimization:** Enhance performance metrics using tools like Lighthouse and GTmetrix.
  4. **Cross-Browser and Device Compatibility:** Verify compatibility on major browsers and devices.
  5. **Documentation:** Create detailed reports and submit professional testing documentation.
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## **Implementation Steps**

### **Step 1: Functional Testing**

**Description:** Validate the functionality of key components to ensure they are operating as intended.

**Features Tested:**

- **Product Listings:** Ensure that all products are correctly displayed with their details.
- **Filters and Search:** Check the accuracy of filter and search functionalities based on user inputs.
- **Cart Operations:** Confirm that users can add, remove, and update products in the cart.
- **Dynamic Routing:** Validate product details pages load correctly.
- **User Registration and Login:** Ensure that the user registration and login flows are functioning as expected.

**Tools Used:**

- Postman (API response testing)
  - React Testing Library (Component testing)
  - Cypress (End-to-end testing)
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## Step 2: Error Handling

**Description:** Implement proper error handling to ensure smooth functionality even in case of failures.

**Approach:**

- Use **try-catch blocks** to handle API errors gracefully.
  - Implement **fallback UI elements**, like "No products available" when no data is returned.
  - Display **user-friendly messages** for network issues, invalid data, or unexpected errors.
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## Step 3: Performance Optimization

**Description:** Identify and resolve performance bottlenecks using optimization tools.

**Key Improvements:**

1. **Optimize Images:** Reduce image sizes and serve in modern formats like WebP.
2. **Lazy Loading:** Implement lazy loading for large images.
3. **Minimize JavaScript:** Reduce unused JavaScript to optimize load time.
4. **Browser Caching:** Set up caching for static assets.
5. **Reduce Initial Server Response Time:** Focus on optimizing the server-side rendering (SSR) response time.

**Performance Metrics (Before Optimization):**

- Performance: 80
- Accessibility: 95
- SEO: 70

**Post-Optimization Metrics:**

- Performance: 88
- Accessibility: 98
- SEO: 85

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## **Step 4: Cross-Browser and Device Testing**

**Description:** Ensure the marketplace is responsive and functions consistently across various browsers and devices.

**Browsers Tested:**

- Chrome
- Firefox
- Safari
- Edge

### Devices Tested:

- Desktop (Mac, Windows)
- Tablet (iPad, Android)
- Mobile (iPhone, Android using BrowserStack)

### Focus Areas:

- **Responsive Design:** Ensure the layout adapts to different screen sizes.
  - **UI Consistency:** Verify consistent UI/UX across platforms.
  - **Accessibility:** Test with keyboard navigation and screen readers.
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### Step 5: Security Testing

**Description:** Secure the application from potential vulnerabilities and exploits.

#### Key Actions:

1. **Input Sanitization:** Ensure all form inputs are sanitized to prevent SQL injection and XSS attacks.
2. **HTTPS for API Calls:** Ensure that API calls are made over HTTPS to secure data in transit.
3. **Environment Variables:** Store sensitive data like API keys in environment variables instead of the frontend.

#### Tools Used:

- **OWASP ZAP** (Automated vulnerability scanning)
  - **Burp Suite** (Penetration testing)
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### Step 6: User Acceptance Testing (UAT)

**Description:** Simulate real-world scenarios to identify usability issues.

**Scenarios Tested:**

- **Product Browsing:** Test the ease of navigation and product search.
- **Cart Functionality:** Ensure items can be added, removed, and updated in the cart.
- **Checkout Flow:** Verify the accuracy of the checkout process, including payment.

**Feedback Collected:**

- Improved cart functionality to make updates more intuitive.
- Tweaked the checkout process to reduce steps for a smoother flow.
- Enhanced product filtering for a more precise user experience.

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## **Step 7: Documentation Updates**

**Description:** Compile all findings and results into a professional report.

**Includes:**

- Test case descriptions and results.
  - Performance improvements.
  - Security measures implemented.
  - Challenges faced and resolutions applied.
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## CSV-Based Testing Report

Test Case ID	Description	Expected Result	Actual Result	Status	Severity	Remarks
TC001	Test navigation links	All links navigate correctly	All links function as intended	Pass	Low	None
TC002	Verify product listing display	Products display correctly	Products display correctly	Pass	Medium	None
TC003	Test cart functionality	Add, update, remove items correctly	Cart functions as expected	Pass	High	None
TC004	Check product details page	Product details load correctly	Product details load correctly	Pass	High	None
TC005	Verify mobile responsiveness	Page displays correctly on mobile	Mobile view works fine	Pass	Medium	None
TC006	Performance optimization	Performance score $\geq 85$	Score: 88	Pass	High	Optimized images
TC007	Test security measures	No vulnerabilities	Secure API	Pass	High	Secure API keys

Test Case ID	Description	Expected Result	Actual Result	Status	Severity	Remarks
		es detected	calls, no leaks			
			Login			
TC008	Test user login	User can log in and register	works as expected	Pass	High	None

## Conclusion

The **Furniture Web** marketplace project is now thoroughly tested, optimized, and secure. By conducting functional, performance, and security tests, we've ensured that all core features work seamlessly. The error-handling measures implemented enhance the overall user experience, making the application more resilient to issues. Cross-browser and device testing confirmed that the marketplace provides a consistent and responsive experience across platforms.

Performance optimizations have improved load times, and security measures, such as input sanitization and HTTPS, have strengthened the application's defenses. User Acceptance Testing (UAT) revealed useful feedback, leading to minor adjustments that further enhance usability.

The comprehensive documentation now includes testing reports, performance improvements, and security measures, ensuring the project is ready for deployment and future scalability.

With all testing phases completed and optimization efforts successfully applied, the **Furniture Web** marketplace is well-positioned for a smooth launch and an excellent user experience.

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