Day 5 - Testing, Error Handling, and Backend Integration Refinement - Reliable Furniture Hub

Objective

Day 5 focuses on refining our marketplace by conducting thorough testing, improving error handling, and optimizing backend integration to ensure a smooth and professional user experience.

Key Learning Outcomes

- ✅ Conduct comprehensive functional, performance, and security testing.
- ✅ Implement robust error handling with clear user feedback.
- ✅ Optimize performance, ensuring faster load times.
- ✅ Verify cross-browser and device responsiveness.
- ✅ Update documentation with testing reports and resolutions.

Testing & Refinement Process

1 Functional Testing

✅ **Tested Features:**

- Dynamic Product Listing (Home & Shop Page)
- Product Detail Page (Routing & Data Fetching)
- Cart & Wishlist Functionality (Add, Remove, Store in LocalStorage)
- Search, Filters & Sorting (Ensuring correct results)
- Pagination (Validating page navigation and product display)

✅ **Tools Used:**

- Manual Testing (Simulating user flows)

2 Error Handling

✅ **Implemented Robust Error Handling:**

- **Try-Catch Blocks:** To catch API failures and display appropriate messages.
- **Fallback UI:** Shows relevant messages when no products are available.
- **Logging Mechanism:** Console errors are logged for debugging.

✅ **Examples:**

```
try {
  const data = await fetchProducts();
  setProducts(data);
} catch (error) {
  console.error("Failed to fetch products:", error);
  setError("Unable to load products. Please try again later.");
}
```

3 Performance Testing

✅ **Tools Used:**

- Google Lighthouse (Performance Analysis)
- GTmetrix (Page Load Speed Testing)
- Chrome DevTools (Network Request Optimization)

✅ **Optimizations Implemented:**

- **Image Compression:** Reduced image sizes using WebP format.
- **Lazy Loading:** Implemented lazy loading for product images.
- **Code Splitting:** Optimized JavaScript bundles for better performance.
- **Caching Strategies:** Enabled browser caching to speed up page loads.

4 Cross-Browser & Device Testing

✅ **Browsers Tested:** Chrome, Firefox, Safari, Edge ✅ **Devices Tested:** Mobile (iOS & Android), Tablet, Desktop ✅ **Responsive Design Fixes:**

- Fixed layout shifts in mobile view.
- Adjusted text and image sizes for better readability.

5 Security Testing

✅ **Vulnerability Checks:**

- Ensured **API keys** are stored securely in environment variables.
- **Input Validation:** Prevented SQL injection & XSS attacks.
- **HTTPS Implementation:** Verified secure API communication.

6 User Acceptance Testing (UAT)

✅ **Real-User Testing Scenarios:**

- Simulated user journeys for product browsing, adding items to cart, and checkout.
- Collected feedback from test users and applied UI/UX improvements.

7 Documentation Updates

✅ **Created Testing Report:**

- **CSV-Based Report with Test Cases & Results**
- **Detailed Summary of Fixes & Resolutions**
- **Updated README in GitHub Repository**

Final Review

- ✅ Fully tested and functional marketplace components.
- ✅ Implemented proper error handling and performance optimizations.
- ✅ Verified security measures for data protection.
- ✅ Created professional testing documentation.

🚀 **Milestone 5 Successfully Completed!** 🎉