Day 5: Testing, Error Handling, and Backend Integration Refinement.

Objective

Day 5 focuses on ensuring that the furniture marketplace is deployment-ready by thoroughly testing its functionalities, optimizing its performance, and documenting results. Key areas include:

1. Conducting comprehensive testing of core functionalities.
2. Implementing robust error handling mechanisms.
3. Optimizing for performance, accessibility, and SEO.
4. Ensuring cross-browser and cross-device compatibility.
5. Documenting findings and fixes in a professional format.

Key Learning Outcomes

1. Validate all functionalities through functional and user acceptance testing.
2. Improve website performance metrics using tools like Lighthouse.
3. Ensure high accessibility scores for users with disabilities.
4. Enhance SEO for better search engine visibility.
5. Prepare detailed documentation and a CSV-based testing report.

Implementation Steps

Step 1: Functional Testing

Description: Validate the functionality of key components to ensure they work as expected.
Features Tested:

- Product listing and details: Verify accurate rendering of products.
- Shopping cart operations: Validate add, update, and remove functionalities.
- Blog accessibility: Ensure blog content is accessible.
- Contact form: Confirm successful form submissions.

Tools Used:

- Postman: For API response testing.
- React Testing Library: For component behavior testing.
- Cypress: For end-to-end testing.

Step 2: Error Handling

Description: Implement mechanisms to gracefully handle errors and provide user-friendly feedback.
Approach:

- Utilize try-catch blocks to handle API errors.
- Display fallback UI elements, such as "No products available" when data is unavailable.
- Log errors for debugging purposes.
- Ensure graceful handling of failed API responses to maintain user trust and interface consistency.

Step 3: Performance Optimization

Description: Identify and resolve performance bottlenecks using tools like Google Lighthouse.
Performance Metrics:

- Performance: 76
- Accessibility: 81
- Best Practices: 100
- SEO: 100

Key Improvements:

1. Reduce initial server response time (currently 630 ms).
2. Optimize images (savings of 39 KiB) and serve in next-gen formats (savings of 315 KiB).
3. Address cumulative layout shift (CLS: 0.494).
4. Minimize unused JavaScript (savings of 25 KiB).
5. Implement lazy loading for large images.
6. Compress static assets and enable browser caching to improve repeat visits.

Step 4: Cross-Browser and Device Testing

Description: Ensure consistent functionality and rendering across browsers and devices.

Browsers Tested:

• Chrome, Firefox, Safari, Edge.

Devices Tested:

• Desktop, tablet, mobile (using BrowserStack).

Focus Areas:

- Responsive design.
- Consistent navigation and interactivity.
- Verified accessibility features, including keyboard navigation and screen reader compatibility.

Step 5: Security Testing

Description: Secure the website against vulnerabilities.

Key Actions:

- Sanitize user inputs to prevent SQL injection and XSS attacks.
- Ensure API calls are made over HTTPS.
- Store sensitive information in environment variables.

- Conduct penetration testing to identify hidden vulnerabilities.

Tools Used:

- OWASP ZAP: For automated vulnerability scanning.
- Burp Suite: For penetration testing.
- Manual testing for additional verification of potential vulnerabilities.

Step 6: User Acceptance Testing (UAT)

Description: Simulate real-world user interactions to identify usability issues.

Scenarios Tested:

- Browsing products.
- Adding and removing items from the cart.
- Completing the checkout process.
- Testing multi-step workflows to ensure an intuitive user experience.

Feedback Collected:

- Minor UI inconsistencies identified and resolved.
- Improved workflows for better user experience.
- Adjusted visual hierarchy to emphasize key actions like "Add to Cart."

Step 7: Documentation Updates

Description: Compile findings and resolutions into a professional report.

Includes:

- Test case descriptions and results.
- Performance optimization steps.
- Security measures implemented.
- Screenshots of issues and fixes.
- Additional insights into areas for future improvement.

Test Case ID	Test Description	Steps	Expected	Actual	Status	Severity	Assigned	Remarks
TC001	Verify Product Page	Open product page	Page displays product details	Displayed correctly	Passed	Low	Ameen	Success
TC002	Add to Cart	Click 'Add to Cart'	Product added to cart	Added	Passed	Low	Ameen	Success
TC003	Price Display	Open product page	Price visible correctly	Visible	Passed	Low	Ameen	Success
TC004	Empty Cart	Go to cart	Cart shows '0 items'	Shows '0 items'	Passed	Low	Ameen	Success
TC005	Add Multiple to Cart	Add 2 products	Cart shows 2 items	2 items	Passed	Low	Ameen	Success
TC006	Checkout Process	Proceed to checkout	Checkout works smoothly	Completed	Passed	High	Ameen	Success

CSV-Based Testing Report

Test Case ID	Test Description	Steps	Expected	Actual	Status	Severity	Assigned	Remarks
TC001	Verify Product Page	Open product page	Page displays product details	Displayed correctly	Passed	Low	Ameen	Success
TC002	Add to Cart	Click 'Add to Cart'	Product added to cart	Added	Passed	Low	Ameen	Success
TC003	Price Display	Open product page	Price visible correctly	Visible	Passed	Low	Ameen	Success
TC004	Empty Cart	Go to cart	Cart shows '0 items'	Shows '0 items'	Passed	Low	Ameen	Success
TC005	Add Multiple to Cart	Add 2 products	Cart shows 2 items	2 items	Passed	Low	Ameen	Success
TC006	Checkout Process	Proceed to checkout	Checkout works smoothly	Completed	Passed	High	Ameen	Success

CSV Content

CSV Format (Revised)

```
Test Case ID,Test
Description,Steps,Expected,Actual,Status,Severity,Assigned,Remarks
TC001,Verify Product Page,"Open product page","Page displays product
details","Displayed correctly",Passed,Low,Ameen,Success
TC002,Add to Cart,"Click 'Add to Cart'","Product added to
cart","Added",Passed,Low,Ameen,Success
TC003,Price Display,"Open product page","Price visible
correctly","Visible",Passed,Low,Ameen,Success
TC004,Empty Cart,"Go to cart","Cart shows '0 items'","Shows '0
items'",Passed,Low,Ameen,Success
TC005,Add Multiple to Cart,"Add 2 products","Cart shows 2 items","2
items",Passed,Low,Ameen,Success
TC006,Checkout Process,"Proceed to checkout","Checkout works
smoothly","Completed",Passed,High,Ameen,Success
```

Conclusion

Day 5 successfully focused on enhancing the marketplace's reliability, performance, and user experience. Comprehensive testing ensured all functionalities work as intended, while optimizations improved performance metrics and accessibility. Remaining SEO enhancements and performance tweaks will further refine the platform for deployment. This documentation and CSV report provide a clear roadmap of actions taken and next steps.

Future Recommendations:

- Continue to monitor performance scores with frequent testing cycles.
- Implement AI-powered recommendations for personalized user experiences.
- Conduct periodic security audits to ensure ongoing protection.