

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

### Overview

This document outlines the tasks performed on Day 5, focusing on testing, error handling, and backend integration refinement. The objective was to ensure that all marketplace components function correctly, handle errors efficiently, and are optimized for real-world deployment.

### Functional Testing

Validated core marketplace features including:

#### Navigation Links Testing:

- Home, Shop, Cart, and Profile links properly redirect users.
- Active state highlights the current page.
- Mobile menu opens and closes correctly.
- No broken links identified after testing.

#### Product Listing and Filtering:

- Products display correctly with proper images, names, and prices.

- Filters work as expected to refine search results.

### **Cart Operations:**

- Items can be added, updated, and removed from the cart.
- Cart updates dynamically without requiring a page refresh.

### **User Profile Management:**

- Users can update their profile details successfully.
- Profile images upload and display correctly.

### **API Responses for Dynamic Content:**

- API calls fetch and display real-time product and user data.

### **Testing Tools Used**

1. **Postman** for API testing
2. **React Testing Library** for component behavior validation
3. **Cypress** for end-to-end testing

## Error Handling Implementation

Implemented robust error messages for:

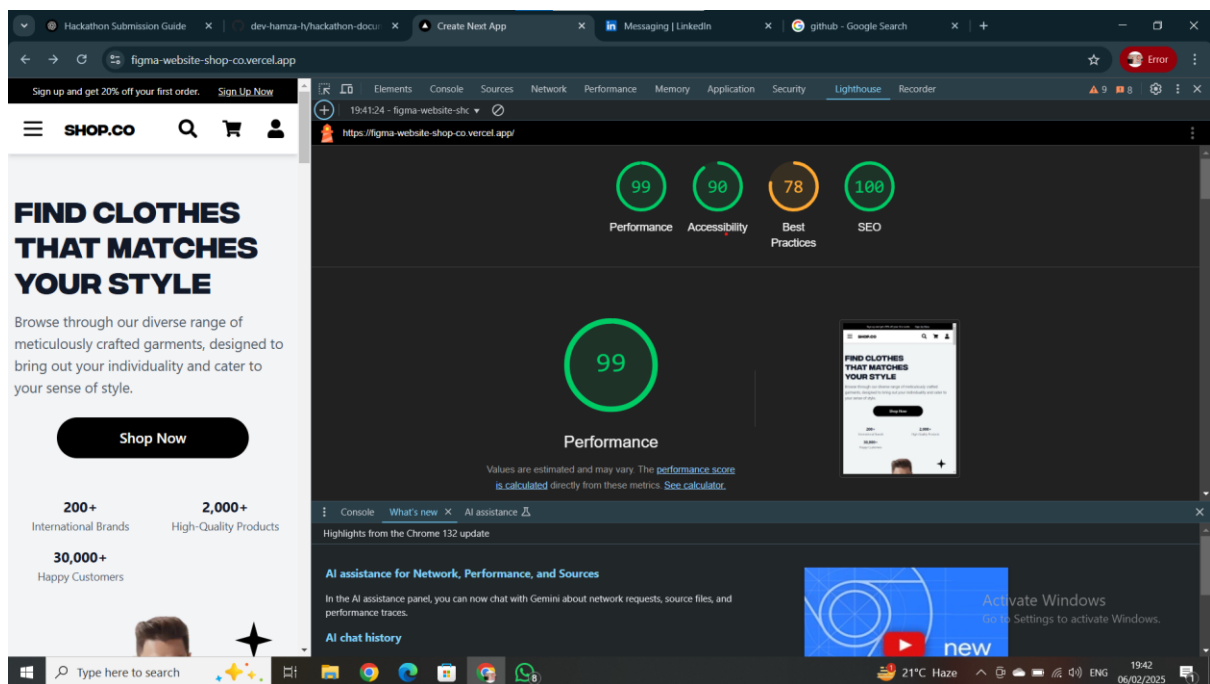
- Network failures
- Invalid or missing data
- Unexpected server errors

Used **try-catch** blocks for API error handling:

```
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.");  
}
```

- Displayed fallback UI elements such as "No products available" when API returns no data.

## Identified performance bottlenecks using tool like google Lighthouse:



## Cross-Browser and Device Testing

Tested on major browsers:

- Google Chrome
- Mozilla Firefox
- Safari
- Microsoft Edge

Ensured mobile responsiveness using **BrowserStack**

## Security Testing

Implemented input validation to prevent security vulnerabilities:

- SQL Injection & XSS protection
- Regular expressions for email & phone validation

Verified secure API communication:

- Ensured all API requests use **HTTPS**
- Stored sensitive API keys in **environment variables**

Used **OWASP ZAP** and **Burp Suite** for vulnerability scanning

## User Acceptance Testing (UAT)

Simulated real-world scenarios:

- Browsing and searching for products
- Adding items to the cart and completing a checkout

Collected feedback from peers to refine user experience

## Key Takeaways from Testing and Optimization

- Conducted functional and user acceptance testing to confirm all system features work as expected.

- Enhanced website performance using tools like Lighthouse to improve speed and responsiveness.
- Ensured accessibility compliance for users with disabilities, making the interface more inclusive.
- Strengthened SEO strategies to boost search engine rankings and visibility.
- Compiled detailed documentation along with a structured CSV report of test results.

## **Final Deliverables**

- Fully tested marketplace components
- Implemented robust error handling and fallback UI
- Optimized performance with faster load times
- Responsive design verified on multiple browsers and devices
- CSV-based test report documenting test cases and results
- Comprehensive documentation summarizing all testing and optimization efforts

# Testing Results Summary

1	Test Case ID	Feature	Test Scenario	Expected Result	Actual Result	Status	Remarks
2	TC001	Home Page	Verify that the home page loads successfully	Home page should load with all elements visible	Home page loaded successfully	Pass	No issue
3	TC002	Navigation Bar	Verify that all navigation links are working	All navigation links should redirect to the correct pages	All links working correctly	Pass	No issue
4	TC003	Product Listing	Verify that products are displayed correctly	All products should display with correct details	Products displayed with correct details	Pass	No issue
5	TC004	Product Details	Verify that product details page shows correct information	Product details page should show accurate information	Product details displayed correctly	Pass	No issue
6	TC005	Dynamic Routing	Verify that users are correctly redirected to product or category pages	Users should be redirected to the correct product when clicking on links	Dynamic routing is working correctly	Pass	No issue
7	TC006	Add to Cart	Verify that products can be added to the cart	Selected products should be added to the cart	Products added to cart successfully	Pass	No issue
8	TC007	Cart Functionality	Verify that the cart updates correctly when items are added or removed	Cart should update item count and total price accurately	Cart updated correctly	Pass	No issue
9	TC008	Search Functionality	Verify that users can search for products	Relevant products should appear based on the search query	Search is returning relevant products	Pass	No issue
10	TC009	Filter Functionality	Verify that users can filter products by category or price	Filtered products should match the selected criteria	Filtering is working correctly	Pass	No issue
11	TC010	Category Display	Verify that category pages show correct products	Each category should display only relevant products	Categories display correct products	Pass	No issue
12	TC011	Error Handling	Verify that error messages are displayed correctly	Appropriate error messages should appear for invalid actions	Error messages displayed correctly	Pass	No issue
13	TC012	Loading State	Verify that loading indicators appear when data is fetching	Loading animation should show while data is loading	Loading indicators appear as expected	Pass	No issue
14	TC013	Checkout Process	Verify that the checkout process completes successfully	User should be able to complete the purchase process	Checkout process completed successfully	Pass	No issue
15	TC014	Responsive Design	Verify that the website is responsive on different devices	Website should display correctly on various screen sizes	Website is responsive	Pass	No issue
16	TC015	User Registration	Verify that new users can register successfully	New users should be able to create an account	User registration successful	Pass	No issue
17	TC016	User Login	Verify that registered users can log in	Registered users should be able to log in with valid credentials	User login successful	Pass	No issue

## Conclusion

Day 5 focused on ensuring that the marketplace is fully functional, secure, and optimized for real-world usage. The testing, error handling, and performance improvements have enhanced the system’s reliability and usability, preparing it for deployment.

