PRACTICAL TEST APPROACH FOR AN ECOMMERCE APPLICATION

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1. INTRODUCTION

In the new digital era, ecommerce has revolutionized the way consumers are researching and purchasing products online. Any customer-facing ecommerce application has high business stakes. Any end-user of an ecommerce application (whether business or consumer), may lose confidence in a website with numerous outages, transactions slings in the middle, poor performance or bad usability. While the need of the hour is to build ecommerce applications in quick time, it's equally important to conduct exhaustive testing and certify on good user experience, mobile responsiveness, fast load time, data privacy, and secure transaction processing. This white paper recommends a pragmatic and cost-effective approach to test ecommerce applications.

2. WHAT IS ECOMMERCE

Ecommerce can be defined as trading in products or services and making transactions using computer networks or any electronic means. It includes technologies, such as e-payments, mobile commerce, electronic data interchange, supply chain management, and inventory management systems. ecommerce is an advanced medium of transacting, and almost every product or service can make use of electronic commerce as their form of trading from financial services and tickets selling to online products selling.

An ecommerce platform is a combination of software solutions that help businesses create relevant, engaging, and personalized experiences. An ecommerce platform takes care of multiple steps in the purchase process, such as order management, accounting, customer service, and inventory management. BigCommerce is an example of an ecommerce platform.

The most common perception of ecommerce is that of an online commercial transaction between a business and a client. However, ecommerce can be classified into various categories based on the stakeholders involved and the nature of the business.

There are seven types of ecommerce models:

B2C	**B2B**	**C2C**	**C2B**	**B2G**	**G2B**	**G2C**
Business-to-consumer	Business-to-business	Consumer-to-consumer	Consumer-to-business	Business-to-government	Government-to-business	Government-to-consumer

The top advantages for starting an ecommerce business are eliminating geographical limitations, gaining new customers with search engine visibility, lower costs for maintenance and rent, and higher capacity for goods and deliveries. Moreover, retailers can use analytics to keep a constant monitoring system in place to analyze consumers' buying habits and tailor offers to suit their requirements.

3. KEY TEST FOCUS AREAS

Below are some of the key focus areas in ecommerce testing:

3.1 Major segments in ecommerce

a. Homepage

This is the first impression of the website that the user lands on to see, so make sure that the end-user loves it. While there are plenty of elements to be validated, the prime focus of QA team includes the below (but not limited to) components:

- Hero Image: Auto-scroll, refresh, mouse hover, mouse click
- Bestsellers
- Social Feeds
- Promotional banner
- Headers/Logos

Factors to consider while testing the rest of the homepage:

- Is it easy for the user to find the shopping cart?
- Can the login/signup button be easily located?
- Is the contact information easy to be located?

b. Search

The search feature is one of the most used options in an ecommerce store to identify the desired product. Search results, for the same keyword, may vary with the page from where a consumer is trying to find the right product. Here are some of the test scenarios for search feature:

- Search using the product name, brand name, or the generic product category.
- Sort functionality (sort by price, brand, etc.)
- Products per page
- Pagination

c. Product details page

This is the page where the user is directed from the search results or by browsing the various categories. Here are a few factors to check on the product details page:

- Image clarity on screens of different resolutions
- Product price
- Specifications of the product
- Customer reviews and ratings
- Check out options
- Stock accuracy
- Variations of the product (size, color, etc.)
- Similar products
- Other products bought by customers who purchased this item

d. Categories

Categories are useful to keep a website coherent and help customers to get to the desired product quickly. Testers need to ensure that the customer can navigate to the product details page by following the hierarchy of Categories and Sub Categories. It's difficult to validate each product in each category, but the testing team needs to ensure that all the categories and subcategories links function as intended.

e. Transactions

Transaction processing is one of the most crucial areas in testing. For the transaction journey to be seamless, secure and foolproof, the following scenarios need to be validated:

- Check all the different payment options
- Checkout for guest/registered user
- Sign-in page for a returning customer
- Payment timeout
- Return page post successful payment
- Email confirmation with Order No. post successful purchase

f. Order processing, shipping, and delivery

Once the customer has completed the purchase, below are some of the scenarios to be validated:

- Modify the order
- Cancel the order
- Track shipment
- Returns

g. Browser compatibility& page appearance

Browser compatibility testing is essential to ensure that the pages are correctly rendered, and the functionality is as intended. Testers need to validate all pages in different browsers on different devices to enhance efficiency and user experience.

h. Session management (login and security)

Most of the applications manage a session using cookies. Cookies are either used to store cart data or for the user with an active account. When a user logs in, a session ID is created and stored against the user in the database. Validating these cookies and the session should be the top priority.
Below scenarios need to be validated thoroughly during testing:

- Anonymous Bbrowsing- Items added to the shopping cart as an anonymous user remain in the shopping cart when the user registers and sign in to the account
- Session expiry after a timeout
- Logout

3.2 Essential testing types

i. Usability

Usability Testing is essential when developing an ecommerce site. The most important area to focus on an ecommerce site is shopping cart abandonment, which is the effect of bad UX design. Testing should find out the ease of identifying and purchasing the product, adding the item to the cart, and completing the purchase without hassle. Also, the other primary focus areas for testing are viable delivery options, conversions (for international websites), and payment options.

j. Mobile responsiveness

Today, mobiles and other handheld devices have overtaken desktops and laptops when it comes to internet usage and online shopping. Hence, it's essential to check ecommerce websites for mobile responsiveness. Testing is required to ensure that the page layout/content aligns with varying screen sizes. Here are a few factors to look for:

- Do users have to zoom to view all portions of the site constantly?
- How long does it take for various pages to load on the mobile device?
- Do users need to scroll continuously to view the entire page of a website?

It may not be possible to test on real devices for different combinations of screen sizes, OS versions, and browsers. Hence emulators and simulators can be used for testing.

k. Content analysis

Content analysis plays an important role, especially for the product category and the product detail pages. Validation should be done on these pages, and issues should be reported for any inaccurate information such as product specifications, reviews, and ratings, help documents, or manuals not correctly showing up in specified sections.

l. Performance testing

Testing plays a very crucial role in the success of an ecommerce application. It's crucial to conduct load testing with more than the anticipated peak volume in a production-like environment and ensure that the application behavior is as per agreed SLA. Below are a few KPIs to gauge the performance of different functional workflows in an ecommerce application:

- Average Response time
- Throughput
- Error rate
- Page Load time

In addition to the above, we can also perform network and OS performance tests.

m. PCI compliance

PCI DSS is a set of requirements designed to help businesses to protect the customer cardholder data against fraud through robust payment security. All organizations that accept or process credit

payments are required to undertake an annual PCI DSS audit of security controls and processes, covering areas of data security such as retention, encryption, physical security, authentication, and access management.

DSS penetration testing is designed to include assessment of network infrastructure and applications from both outside and inside an organization's network environment. PCI pen test will help us to identify:

- Unsafe system and network configurations
- Improper access controls
- Rogue wireless networks
- Common coding vulnerabilities such as cross-site scripting (XSS) and SQL injection
- Broken authentication and session management
- Encryption flaws

n. Web accessibility

Content accessibility plays an instrumental role in ensuring that the site is accessible to differently-abled people. There are certain levels of standards to meet web accessibility guidelines. The WCAG guidelines drive these test efforts. The team can use any of the following different tools to verify the web accessibility:

- AAChecker
- WAVE
- Siteimprove
- Reader tests can be performed using some of the following tools
- JAWS
- NVAccess
- Chrome VOX
- VoiceOver
- TalkBack

o. PWA

In the last few years, there has been an exponential growth in the number of mobile phone users. Developing progressive web applications is cheaper than developing a native app and is reliable, fast, responsive, installable, and site is available offline too. There are few open-source tools available to verify the PWA:

- House is an audit tool that can run against any web page and generate the audit report with recommendations to improve the experience further
- Offline accessibility
- Page load speeds
- Network connection security
- Add to home screen function
- Mobile-friendly design
- Service Worker presence

p. Search Engine Optimization (SEO)

To grow a customer base, every website needs well-optimized pages with unique and useful content. The conversion can increase by removing broken links, improving navigation, and page loading speeds. Below are some of the validations required to ensure that the essential SEO parameters are defined appropriately:

- Check Site titles, descriptions, H1-H6 tags, size of the page
- HTTP status codes, page size, URL friendliness, display in Google SERP, the correct filling of meta title, description, and h1 tags.
- Find images without title or no alt attributes
- Check Google score for usability and speed on desktop, mobile versions

q. Web analytics

Owners must come up with different marketing tactics for customer retention /new customer acquisition. For them to thrive in the market, they need to make better decisions faster. This is where web analytics comes into play. Below are some of the analytics KPIs that may improve the conversion rate on the website:

- Number of visits
- Their duration on site
- Source of traffic
- Visited pages
- Most purchased/viewed/searched product
- User abandoned pages
- Tools/Plug-ins for validating the analytics.
- Observe Point
- Omnibug
- Charles Proxy for mobile analytics

r. Customer communication

Customers expect emails from any ecommerce website. The following are some of the email correspondence that need to be validated for content:

- Validate the Registration Confirmation Email
- Validate the Password Reset Email
- Validate the Passwords Reset Confirmation Email
- Validate the Order Confirmation Email
- Validate the Order Shipped Email
- Validate the partial order shipped Email
- Validate the back in stock Email
- Validate the Order canceled Email

4. INTEGRATION TESTING WITHTHIRDPARTY SERVICES

Here are some of the major third-party integration services that need to be validated:

a. Address and tax validations

The tax rates and the applicable tax rules vary with the location, address, and product type. Testing should verify 3rd party integrations (e.g., Avalara) covering all the below scenarios:

- Country specific address validation
- Countrytaxed state validation
- Country tax-free state validation

b. Payment gateway

The payment gateway is a web-based service that integrates into an ecommerce website's shopping cart and collects payment information provided by customers at the check-out. Below are some of the scenarios that need to be validated for Payment processing:

- Payment with Visa, Amex and Mastercard and verify the payment gateway response
- Cancel the order and check the fund's transfer to the respective account
- Fraud detection
- Session timeout during payment processing
- Failure during payment processing
- Error and security pages
- Success code and confirmation page for successful payment
- Verify email correspondence post-transaction processing

c. Order management system

Testing the Order Management System (OMS) should include:

- Synchronization of order management across multiple channels and customer service and distribution centers
- Manage complex, overlapping pricing scenarios, and intricate product and order configurations (for instance, bundling of the products together and offering a discounting structure for products)
- Validate sophisticated order fulfillment, cross-selling, up-selling, and execute pricing and promotions accurately to specific targets

d. Product information management

Consumers expect rich and consistent product information on websites to make purchasing decisions. Hence it is essential for ecommerce website owners to display relevant product details with high clarity images in an ecommerce site. Product Information Management (PIM) addresses the demands by providing capabilities to manage products, catalogs, digital assets, and distribute product information to the omnichannel environment.

Testing should focus on the product image/content and check the data integrity and Performance in UI.

e. CDN

A Content Delivery Network (CDN) is a connected system of tactically placed computers that provides content to a higher number of users by duplicating it across those servers and delivering it from the server that is nearest to each user. A CDN can provide identical static and dynamic content throughout the world to many users precisely at the same time. Testing whether the content is identical and in sync across the entire network should be the thumb rule.

The CDN testing process is inclusive of both website testing and specific procedures related to the network – A few of the focus areas for testing are Content Testing, Geolocation Testing, Network simulation, Caching, etc.

f. Social logins

For shoppers, the social login functionality means almost instant access to an online store without registering to the site. Integration testing will reveal social media API is working fine on the website. Testers can validate these logins and verify the users are created at the backend and render all the social login information like email, names, age, etc.

g. Social feeds

Most customers don't make purchases the first time they visit an online store. Integrating social feeds, like product videos shared on social channels, images shared on social media, etc., on to ecommerce website keeps the customer engaged and increases the chances of purchase. Testers need to validate if all the social media links/buttons/images are functioning properly on an ecommerce website.

h. Store locator

For the ecommerce shoppers who prefer to purchase items in-store, the Store Locator feature on the website shows up the direction of the nearest store as per the current location. Tests are executed to find the store locator functionality. Finding the stores based on the IP based location and matching the results with the nearest location with set distance.

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