

A good E-commerce/Retail site is key to its success. It is important to test ecommerce websites and mobile applications so that it won't compromise on various crucial factors such as user experience, mobile responsiveness, customer data security, quick load time, and secure transaction. Also, the success of ecommerce website (or mobile application) depends on proper functioning of these factors and do not have any bugs in it. Ecommerce applications have lots of users worldwide as they deal with finance, marketing, retail & wholesale, manufacturing, and auctions. There have been many cases of ecommerce application failure and these failures can be avoided by implementing better testing techniques. The main reasons for testing your ecommerce application is to check the usability of the application, its user-friendliness, and to make your ecommerce website/application bugs-free.

Here are seven important things on how to test ecommerce website or application.

- 1) **Browser compatibility** Customers will become frustrated if they can't get to your e-commerce site easily. Though relatively simple to do, it pays to spend enough time testing in this area. Lack of support for early browsers. Not all browsers are equal. For example, some early versions of Internet Explorer and Netscape Navigator do not fully support JavaScript. Decide on the lowest level of compatibility-for example, "the system should be compatible with IE version 3.0 and above and Netscape version 2.0 and above"-and test that the system does indeed work without problem on the early browser versions.

## 2) **Testing Ecommerce Application's Functionality**

An ecommerce web or mobile application has four important elements in its structure, and they are:

- **Main Pages** – Homepage, Product page, Special Offers, About Us page, Sitemap pages, Privacy Policy page, Press Releases page, etc.
- **Category / Product Type Pages** – The product page consists of options such as product size, color, and type. There is sorting feature to filter out products based on price, model, size, etc. There is also "Add to Cart" or "Add to Wishlist" feature present in the category pages.
- **Product Description Page** – Consists of product title, description, product images, related products, Add to Cart feature, Product comparison, additional product info, etc.
- **Shopping Cart** – Products list view, removing product from the list, cash on delivery option, Select delivery option, card payment, pay now option, etc.

Before you conduct functionality testing, we need to understand the ecommerce website or application very well. The above mentioned features are commonly found on all ecommerce applications, yet most of them are customized as per business requirements.

## 2) **Testing Ecommerce Application Workflow**

The testing of the complete workflow of your ecommerce web/mobile application consists of:

- Login and Signup options
- Search functionality
- Product review posting feature
- Sorting feature
- Applying filters for choosing desired product(s)

- Add/remove functionality in the shopping cart
- Check out process
- Order number and invoice generation
- Payment gateway and payment processing

### **3) Payment Gateway Functionality**

Another important functionality to test is the payment gateway and you have to conduct multiple tests to ensure it functions properly and provides security while doing online transactions. Here are the checkout and payment processes that you need to test:

- You need to check the product price is correct, shipping charge, VAT, discount codes all are applied and the price customer has to pay is the right amount. You can test this payment process by making changes in the final list of products, applying different discount coupon codes, choosing different region to see the change in shipping charges.
- You need to check whether the payment is processed correctly, by using all kinds of payment methods such as net banking, Credit/Debit card, PayPal, etc. You can check all these using dummy accounts and demo debit/credit card numbers. Also, you need to check whether the orders are cancelled, and the payment ID sent back.
- Check whether the invoice and emails generated after the payment process are sent.
- You need to also ensure the refund process, email, and refund receipt all are working properly.

### **4) Performing Security and Vulnerability Assessments**

Since ecommerce applications hold valuable information (customer's personal and banking data) you need to conduct security testing to check for security and vulnerability issues in them. You can use testing methods like SQL Injections, ethical hacks on Login, Register, Payment gateway, and other various pages.

### **6) Testing for Mobile Responsiveness**

Nowadays, mobile devices are taking over desktop platforms in terms of internet usage and companies are taking mobile-first approach in their ecommerce applications. You need to test the responsive design of your application in mobile devices of various screen sizes.

### **7) Checking Performance and SEO-related Things**

Another important thing in ecommerce testing is to check the performance of your website/application. You need to conduct performance testing on parameters such as webpage loading speed, throughput, data transfer rate, efficiency, uptime, database performance, website traffic load tolerance, error messages, etc. You need to make your ecommerce website is having high search engine visibility so that you can get considerable user traffic to your site. You can do this by implement search engine optimization (SEO) on your website. You need to test whether SEO strategies such as title tags, meta-descriptions, URL structure, image alt tags, etc are implemented correctly.

### **8) Other Common Things to be Tested**

There are other common things in your ecommerce application you need to test and they include website content, webpage format, website accessibility, cookies, social buttons, adding/deleting content, removing/adding links, web standards, analytics, and making changes to shipping settings.

## 9) Session management

HTTP is a stateless protocol, and server-side programming tools that use Java or Active Server Pages make extensive use of session objects to capture state information. This is, for example, how many pages store items in a shopping cart. Our experience indicates that any system using session management should be tested for several characteristics.

## Verification and Validation

### Verification and Validation

#### There are two aspects of V&V tasks

- Confirms to requirements (Producer view of quality)
- Fit for use (consumers view of quality)

Verification is a process of evaluating the intermediary work products of a software development lifecycle to check if we are in the right track of creating the final product.

Validation is the process of evaluating the final product to check whether the software meets the business needs. In simple words, the test execution which we do in our day to day life is actually the validation activity which includes smoke testing, functional testing, regression testing, systems testing etc...

#### Differences between Verification and Validation

Verification	Validation
Evaluates the intermediary products to check whether it meets the specific requirements of the particular phase	Evaluates the final product to check whether it meets the business needs.
Checks whether the product is built as per the specified requirement and design specification.	It determines whether the software is fit for use and satisfy the business need.
Checks “Are we building the product right”?	Checks “Are we building the right product”?
This is done without executing the software	Is done with executing the software
Involves all the static testing techniques	Includes all the dynamic testing techniques.
Examples includes reviews, inspection and walkthrough	Example includes all types of testing like smoke, regression, functional, systems and UAT

## Implementation

Implementing an e-commerce shopping cart gives your business the ability to sell your products online day and night, reach new clients, target your ideal market, establish a strong brand, and build closer relationships with your customers by improving their purchasing experience.

***Advantages of eCommerce implementation:***

- Allows you to sell products 365 days a year, 24 hours a day.
- Lowers your costs and raises your sales margins
- Creates cost-saving efficiencies
- Creates an automated cycle of repeat business
- Connects you to new customers previously unavailable to you due to distance and operating hours
- Collects customer data, demographics, and produces marketing leads
- Gives your customers control over how and when they'd like to shop

**A 7-Step Framework for Successful Ecommerce Implementation**

**Successful implementation of any ecommerce business is dependent on implementing or adopting these seven key steps:**

- 1) Planning for eCommerce Business
- 2) Technology Selection/Website Audit & Analysis
- 3) Customer Acquisition
- 4) Customer Engagement
- 5) Customer Retention
- 6) Optimizing Key Metrics, and
- 7) Business Analysis & Customer Insights

Each of these steps has a positive and cascading effect on the other steps and hence implementing each of them in the right priority and in a phased manner is of utmost importance.

For an e-commerce business to get the maximum ROI on their investment, it is the execution of these 7 steps around the 4 core pillars that will be your mantra for success!

**1. Strategic business planning and roadmaps** – Strategy is about making the right choices that will help reach the stated business objectives.

There should to be a clear cut vision, mission and objective about what will be achieved, in how much time, within what budget, identification of the right resources for and

constraints in the face of execution of the strategy mentioned in the business plan, and what elements will be considered for roadmap.

Knowledge and deep understanding of the digital marketing tools and techniques that will help in reaching and acquiring customers is required. Your business must reach out to customers who are online across multiple dimensions and devices.

So, the assumptions considered in preparing the strategic business plan should be in alignment with the ecommerce industry's norms and trends.

**2. Technology selection/ website audit and analysis** – In order to provide the maximum benefit to the end customer, your chosen ecommerce technology should be fully capable of being customizable, and be able to complement the business model, and adhere to the existing best practices in offline retail.

If you're a retailer taking the first-time plunge into ecommerce, various functionalities on the e-commerce website should be carefully thought over based on the industry, audience being targeted, various customer segments who may be buying the offered products and services.

With respect to retailers who have implemented an ecommerce strategy and have not yet received the rewards of the complete capability of the ecommerce technologies, there needs to be a complete assessment of how the website can perform better by examining the store front and customer flow, analysis of competing websites, identification and implementation of solutions based on the gap analysis carried out ('as-is' and 'to-be'). It is equally important to measure and monitor the process that was made because of the implementation of the suggested changes.

**3. Customer acquisition** – Online or popular digital marketing encompasses multiple tools for reaching out to the new generation of customers, who are actively engaged in using multiple devices, through search engine optimization, search engine marketing (paid advertisement that includes both cost per click and cost per thousand impressions), social media marketing (that includes both cost per click and cost per thousand impressions), email campaigns, display advertisements using various ad networks, referral programs and re-targeting campaigns.

Going by the sales principles of AIDA (awareness, interest, desire and action), it's important to note that the cost of customer acquisition will be very high for brands and retailers that are newly establishing their product offerings exclusively online.

However, for brands that are well established offline and are pursuing ecommerce strategy, the cost of customer acquisition is lesser compared to the new entrants.

**4. Customer engagement** – Customers these days are actively seeking to engage with brands to understand the core benefits and unique value proposition that the brand offers, discount and offers during special seasons, a robust support mechanism for queries/clarifications regarding the products displayed and interaction with customer support executives to know more about policies on returns and exchange, etc.

Engaging customers through various social media channels also instills superior trust in the minds of customers.

**5. Customer retention** –With the advent of sophisticated e-commerce technologies, new age retailers will be able to leverage an almost one-to-one customer experience and that's the best a customer can really expect.

However, it should be noted that to fully leverage best-in-class technology, there needs to be a constant effort to look out for features and functionalities that will enhance the customer experience.

**6. Optimization based on key metrics** – Some of the key metrics to measure the health of an ecommerce venture are the total revenue generated, cost of customer acquisition, % of customers converted, and % of customers entering the website through various channels.

However, these metrics may vary significantly based on the business objectives and so every business needs a fully customized approach for defining the key metrics and further analysis.

Once these are defined and there are a substantial number of customers visiting the website, a deeper level of optimization is needed at 2 levels – on the technology and the business front.

- **a. Technology** – This generally includes optimizing the page load speed, shopping cart, check-out and other web pages, a/b and multivariate testing, etc.
- **b. Business** – Optimization here includes analysis of the total revenues generated, total spends for running the e-commerce operations, optimizing the gross net margins, conversion rates from each of the various channels, customer loyalty and retention rates, rate of repeat purchase, frequency of repeat customers (across multiple dimensions), % of carts abandoned, etc.

- There are a lot of features and functionalities to helping online retailers improve these numbers. There is a lot of research evidence supporting the incorporation of features like reviews and ratings, and display of the right products either through up-selling or cross-selling.
- Based on the statistics, 47% of shoppers read product reviews prior to their online purchases and 63% are more likely to buy from websites with online reviews or ratings [1]. Similarly, online companies that leverage a recommendation system can increase sales by 8-10%.

**7. Business analysis and customer insights** – The final step in the entire process is about fine-tuning and understanding the product categories that have performed well compared to other products displayed in the webstore. Assessing this is crucial since each of these categories and products within those categories occupy the prime real estate in the online world – the web store.

- It also should consist of understanding the customer segments, demographics, profitable customers, source of channels through which the profitable customers came to the web store, % of revenue each profitable customer contributes to and the marketing spends that has gone into acquiring these customers.
- These metrics are only a small representation of a larger list that can be optimized further. These metrics vary based on the business needs and require a customized approach for defining, monitoring and optimization.