

E-COMMERCE APPLICATION DEVELOPMENT

UNIT-4

Testing:

E-Commerce testing can be defined as the process of testing various eCommerce website elements such as design, specifications, functionalities, pages, and features to check their sanity and ensure they're not harming the performance of the site in any manner possible.

Risks Can Be Prevented by Performing E-Commerce Website Testing:-

Conducting eCommerce Website Testing not just prevents unsatisfied customers, losing revenues, spoiling brand reputation, but it is also useful in uncovering and avoiding several other risks, such as:

1. Poor Analytics

Through the website, analytics businesses gain important insights regarding website traffic, average order value, sales conversion rate, revenue by traffic source, percentage of returning customers, a lot more. However poor analytics and testing cause businesses to lose their chance of gaining the advantage of a reliable basis to assess overall business strategy.

2. Poor Cart Functionality

Often it happens that customers can find goods they were searching for but can't place the order due to an issue with the shopping cart function, where they might face issues in adding/removing options or in applying discount coupons. This again causes a lot of disappointment for the customers.

3. Slow Website Loading Speed or Weak Search Functionality

Most customers like browsing through the items on offer before they make the final purchase. However, slow loading speed or weak search functionality causes a delay in this process and this can lead to a lot of disappointment and certainly result in a low conversion.

4. Unavailability of Online Store

This is a common problem faced by the service providers, however, a high-quality Website Testing solution can prevent this issue, mainly for high loads during peak times, such as holiday sales.

Test cases of E-commerce website testing:

So, the Test cases are mainly the scripted/non-scripted scenarios created for checking various functionalities of an eCommerce website/application. And here we have provided a comprehensive checklist and important test cases that should be the focus of an eCommerce Website Testing team.

1. General Test Cases

It is vital that the general Test cases for the eCommerce websites are thoughtfully composed in a detailed manner. Various general tests that are required to be executed on the website consists of:

- Whether the website links are redirected to correct category/product pages
- Whether there is clear visibility of the product, price, category name, product description, and company logo
- Whether all category pages have a relevant product that is particularly listed for the category
- Whether the count of the total number of products listed on category pages is correct.

2. Homepage Test Case

In the case of E-Commerce websites, the homepage goes much beyond the simple design features. The homepage is usually seen as a clickable image/slideshow with auto-scroll that redirects your website visitors to specific pages. It is a robust tool for marketing purposes and acts as profile space of the eCommerce website and this is why Testing is extremely crucial at this stage. In the case of the homepage, the specific things that a QA team needs to focus on are:

- Whether the page auto-scrolls and check at what interval the images will be refreshed
- Whether it scroll to the next one when the customer hovers over the homepage
- As the customers click on it, does it take them to the right page or the right product deal
- Whether the loading speed is acceptable for you
- Whether the visitors are able to effortlessly view the rest of the content, like social media links in site footer, banners, newsletters, etc.

3. Search Test Case

This is the most used option in eCommerce websites. However, even with an intuitive and extensive category design, at times it gets difficult for the customers to find products they are searching for. This is why testing the search feature is crucial and it makes it easier for the customers to quickly locate products without any hassle. Things that need to be tested in search functionality are:

- Whether the search is available based on the product name, brand name, etc.
- Whether different sort options are available on the basis of brand, price, ratings/reviews, and more

- Check the ideal number of results to display per page
- In the case of multiple-page results, whether the options are available to navigate between them.

4. Recommended Products Test Case

This essential part often gets neglected in terms of eCommerce Testing. Once the client has made the purchase, there is a follow-up session where the customers are shown recommended items that can be purchased further by them. This is a crucial page that needs to be tested well as it is pivotal in winning customer loyalty in long run. Here you need to check:

- Whether the recommended products offered to the customers are of any interest
- Whether the recommendations are shown on the page as soon as the customer confirms the order they made

5. Payments Test Case

Often customers leave the eCommerce website midway without making any purchase when they fail to make transactions or when there are unsuccessful transactions. And this way one loses a lot of customers and due to this very reason payments are a crucial test case to run a successful eCommerce website. A few important things that need to be tested on the payments page are:

- Are various payment options from start to finish are working well
- Are customers able to checkout as guests for making payments or is registration required before checkout
- When there are returning customers, does the page prompts them to sign-in
- After the payment has been made, what is the return page defined

6. Shopping Cart Page / Checkout Flow Test Case

For an eCommerce website, a Shopping cart is a crucial aspect, and hence thorough checkout flow testing must be done. This way, the customers can easily select & store many items in the shopping cart and purchase them at once. Here one needs to test:

- Whether all the items and their total amount are displayed in the shopping cart
- Check that the users can add the products to their Wishlist.
- Check that the user can purchase the products added to the cart after signing in to the app.
- Check that the user can't add more than the available inventory of the product
- Check that the other pre-paid payment modes are working as expected.
- Check that the product return option is working fine.

7. Product Detail Page Test Case

Testing a product page is a very important aspect of an eCommerce website. Testing ensures that the products displayed on the website are working correctly. On the product page, one finds important information, such as pricing, product image, product description, product specification and it is vital to make sure that all this information is accurately displayed every time a customer login to the app. Here it is important to test:

- Whether is Product Price is displayed
- Whether the Image/Images appear correctly
- Are there specifications (options like color, size, or variations) displayed
- Can users easily access review & check-out options
- Is the Shipping information displayed
- Does the website display delivery options
- Does the website mention in-stock/out-of-stock details

8. Post-Order Page Test Case

When an order is placed on the eCommerce website, there are several actions that can be done in relation to the purchase. And this makes it important to test the post-purchase functionality. A few important test cases on this page include:

- Check if the customer can cancel the order or alter the order quantity
- Check if the customer can review recent purchase orders and previous orders.
- Check if the customer can change the billing or shipping information or other profile info.

9. User (Buyer) Registration/Login – Test cases

- Check whether all the identified fields are added to the registration page/login page.
- Verify if better UI dropdowns, checkboxes, radio buttons, and more fields are present wherever possible other than text boxes.
- Check that after entering all the required fields and clicking the reset/cancel button, the submit request cancels and reset all the fields.
- Verify that leaving the mandatory fields empty and clicking the submit button will result in a validation error.
- Validate the textboxes upper limit.

10. Seller – Product Development Test cases

- Check that duplicate product development is barred through the panel.
- Check that the products that sellers develop become visible on the site after a certain time.
- Check that authenticated sellers attain access to product development panels set for the authorized categories.
- Check panel for verifying mandatory fields.
- Check that the seller can update the price and details of existing products.
- Check that the updates seller made become visible on the site after a certain time.

Types of Testing:-

1. Unit Testing

It focuses on the smallest unit of software design. In this, we test an individual unit or group of interrelated units. It is often done by the programmer by using sample input and observing its corresponding outputs.

Example:

- a) In a program we are checking if the loop, method, or function is working fine
- b) Misunderstood or incorrect, arithmetic precedence.
- c) Incorrect initialization

2. Integration Testing

The objective is to take unit-tested components and build a program structure that has been dictated by design. Integration testing is testing in which a group of components is combined to produce output.

3. Regression Testing

Every time a new module is added leads to changes in the program. This type of testing makes sure that the whole component works properly even after adding components to the complete program.

Example

In school, record suppose we have module staff, students and finance combining these modules and checking if on integration of these modules works fine in regression testing

4. Smoke Testing

This test is done to make sure that the software under testing is ready or stable for further testing. It is called a smoke test as the testing of an initial pass is done to check if it did not catch the fire or smoke in the initial switch on.

Example:

If the project has 2 modules so before going to the module make sure that module 1 works properly

5. Alpha Testing

This is a type of validation testing. It is a type of acceptance testing which is done before the product is released to customers. It is typically done by QA people.

Example:

When software testing is performed internally within the organization

6. Beta Testing

The beta test is conducted at one or more customer sites by the end-user of the software. This version is released for a limited number of users for testing in a real-time environment.

Example:

When software testing is performed for the limited number of people

7. System Testing

This software is tested such that it works fine for the different operating systems. It is covered under the black box testing technique. In this, we just focus on the required input and output without focusing on internal working. In this, we have security testing, recovery testing, stress testing, and performance testing.

Example:

This includes functional as well as nonfunctional testing

8. Stress Testing

In this, we give unfavorable conditions to the system and check how they perform in those conditions.

Example:

- (a) Test cases that require maximum memory or other resources are executed
- (b) Test cases that may cause thrashing in a virtual operating system
- (c) Test cases that may cause excessive disk requirement

9. Performance Testing

It is designed to test the run-time performance of software within the context of an integrated system. It is used to test the speed and effectiveness of the program. It is also called load testing. In it we check, what is the performance of the system in the given load.

Example:

Checking several processor cycles.

10. Object-Oriented Testing

This testing is a combination of various testing techniques that help to verify and validate object-oriented software. This testing is done in the following manner:

- Testing of Requirements,

- Design and Analysis of Testing,
- Testing of Code,
- Integration testing,
- System testing,
- User Testing.

11. Acceptance Testing

Acceptance testing is done by the customers to check whether the delivered products perform the desired tasks or not, as stated in requirements.

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

E commerce implementation:

E-Commerce implementation consists of all the steps related to the launch, update, and maintenance of an online store. E-Commerce allows businesses to sell products from anywhere at any time, and it connects businesses to new customers who were previously unreachable due to distance and hours of operation.

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

Implementation of E-commerce Strategy:

E-Commerce implementation activities can include building new E-Commerce sites, or upgrading and maintaining existing online stores. If you are refreshing your existing online commerce site, begin by evaluating your current sites and goals, and then proceed with the actionable steps to accomplish your objectives. If you are starting from scratch, it can be helpful to follow the complete set of steps detailed below:-

1. Mission, Vision and Values

The first step for any business strategy is writing a mission, vision and values statement. This important step clarifies what the organization is about and what it is trying to achieve. It also determines the values and guiding principles that are used to make business decisions. I believe this is the most important step because it sets the direction and drives performance down to the employee level. Without clarity and articulation of vision, organizations are at risk of distraction and steering off course.

2. Strategic Plan

Once the mission, vision and values are written, a strategic plan can be created. The plan identifies the steps needed to achieve the organization's mission. Strategic plans can be written as long term (1-3 years) or short term (3-6 months). It used to be that strategic plans were written as far out as ten or even twenty years but because of the rapidly changing market conditions, shorter term plans seem to be more common today.

3. Organizational Goals

Business goals are written at the organizational level and involve high level goals that the organization as a whole is trying to accomplish. Goals at this level are typically what a CEO or executive level manager is accountable for to the board or other governing body.

4. Departmental Goals

Once organizational goals are written, these key objectives should be delegated to the next level of management. This is where the chain-of-command disseminates responsibilities throughout the organization. As a CEO has accountability for achieving organizational goals, his/her direct reports share the responsibility and employees help a department manager achieve departmental goals.

5. Employee Goals

Departmental goals should be used to create employee goals so there is shared responsibility for getting things done. The more people who have accountability for achieving goals, the more streamlined the implementation becomes.

6. Job Description

An employees' job description should include their goals and should be updated annually to reflect goal responsibilities. This ensures accountability for goal completion as well as job description accuracy. Another benefit of updating annually is it ensure employees are spending their time on tasks that help with global strategy.

7. Performance Appraisals

A well-structured performance management process incorporates annual goals into the employee appraisal. Holding employees accountable at performance evaluation time ensures targeted employee performance and goal completion.

Organizations that are successful at creating a vision, mission and values statement and develops a strategic plan that drives goals throughout the organization not only experiences success at implementing the plan but also engages employees because they can see how what they do supports the mission of the organization.

Challenges of E-commerce implementation:

1. The need for online identity verification

When a visitor goes to an ecommerce website and signs up, you need to somehow be sure that this is a legit person who wants to buy. This way, you'll avoid fraudulent accounts or bots which could result in revenue losses.

2. Delivering an omnichannel customer experience

One of the biggest problems an online retailer faces is achieving an effective omnichannel customer experience. Customers expect they can reach out to your brand through any number of touchpoints, such as your website, phone, email, social media, your store, and more. All of these touchpoints need to be unified.

3. Outshining the vast competition

Ecommerce is one of the most competitive industries. Variations in different parameters — costs, service, supply chain operations, and more — can make a huge difference for customers. Getting and maintaining your customer base is one of the most tough-to-crack ecommerce challenges.

4. The need to revamp selling tactics

One of the most pressing customer service issues in ecommerce is catching up to modern customer expectations. Many companies lack the necessary insight into customer behavior and buying patterns.

5. Shopping cart abandonment

Shopping cart abandonment is a huge ecommerce business challenge. Even ecommerce giants are not immune to it.

For instance, when brick and mortar heavyweight Nordstrom started an ecommerce portal, they witnessed big opportunity losses of ecommerce sales from abandoned carts. The tedious and bug-filled checkout process was causing customers to flee mid-purchase. This ecommerce problem can't be ignored.

6. Maintaining customer loyalty

Without customer trust and loyalty, your business is bound to struggle. But, acquiring and maintaining customers requires massive effort.

One of the reasons ecommerce businesses face a challenge in building customer trust and loyalty is that often the seller and buyer don't know or can't see each other. This makes interactions less personable.

This ecommerce challenge can only be solved through time and effort. Across multiple transactions, eventually, the company can build this trust and loyalty.

7. The headaches of product return and refund

One of the problems faced by customers in online shopping is returning items. A survey by comScore and UPS, showed 63 percent of American consumers check the return policy before making a purchase and 48 percent would shop more with retailers offering hassle-free returns.

But, when a product is returned, the business suffers a heavy loss in shipment and reputation. Shipping costs in this case have always been an ecommerce problem to sellers.

8. The struggle of competing on price and shipping

Despite customer experience being the most important thing for consumers, online merchants frequently compete on price, too. Price competition particularly affects small ecommerce businesses, as mid-sized and large competitors can often offer products less expensively.

9. Competing against retailers and manufacturers

Many online stores bulk buy products wholesale from manufacturers or distributors, selling them online. This is the basic business model for ecommerce.

But, due in part to ecommerce's low barrier to entry, product manufacturers and retailers have started selling directly to consumers, too. The same company that sells your products may also be your competitor.

10. The heightened demand for data security

Security issues can lead to nightmare scenarios. Fraudsters may post spam and infect websites with viruses. They can potentially gain access to confidential data about your customers' phone numbers, card details, and more.

Consumers, though, don't care what you do, they expect you to protect them fully. Security shouldn't be seen as part of ecommerce challenges — it should be a bare necessity.

Opportunities of e-commerce implementation:

1. Tap A Wider Range of Customers

The first argument that can be made is that there are many downsides to e-commerce business, such as security, fraud, etc. While these are valid, they are not the only negative aspects of e-commerce. Many benefits are present, including lower prices and a wide variety of products marketed on the Internet.

Many businesses are choosing e-commerce because of the opportunities it presents. Companies can advertise their services on the Internet and reach millions of people.

There is no reason why a business cannot grow and become successful on the Internet. Many businesses have found that they can grow revenues and profits by advertising on the Internet. There are also more choices for products available on the Internet than ever before.

2. Get Access to Bigger Marketplaces

The opportunities of e-commerce have created a new business world, where businesses can compete with each other on a global level. When there are less regulation and greater competition, the result is economic growth. Many companies are choosing e-commerce to improve their business. This can be a very actual thing for businesses that want to grow.

E-commerce is also becoming a more affordable option for consumers. Since the prices of computers and the Internet have decreased, consumers can find products and services at an even lower price. This means that they will pay more money and they can choose a broader range of products. Users can conserve a lot of money while getting access to a more comprehensive range of products that they would not otherwise have been able to afford.

3. Expand to Global Sales

E-commerce opportunities make life easier for consumers who do not want to purchase products or services in person. Consumers can buy products online and then simply ship the products sales directly to the consumer. This helps to make life easier for both the merchant and the consumer. Many merchants can have more money in their pockets, helping them grow and improve their business.

E-commerce opportunities are not inadequate at all. The only real evidence that can be made against them is if a business wants to grow, it needs to decide that they believe in, one that is based on facts rather than on assumptions.

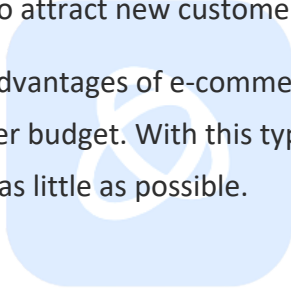
E-commerce opportunities

A good business plan can help businesses decide what type of business will work best for them. This system should include a summary of what kind of business they wish to create and what type of consumers they will attract. This is the most secure way to get a handle on the opportunities of e-commerce.

Advantages of E-commerce

After a business has written a business plan, it should look into the costs of starting the business. A good business owner will carefully consider the potential of this type of business. It should consider the potential revenue, the expenses of running the business, how much it will cost to attract new customers, and how much it will cost to keep existing customers happy.

The advantages of e-commerce include the fact that businesses can make more money on a smaller budget. With this type of business, any business owner can set their own hours and work as little as possible.



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