

Web Testing Complete Guide (Web Application Testing Tips and Scenarios)

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In this article, we will learn **web application testing with test cases for testing a website.**

I always love to share practical knowledge, which in a case can be useful to several users in their career life. This is quite a lengthy article, so sit back and get relaxed to get most out of it.

Web testing checklists

- 1) Functionality Testing
- 2) Usability testing
- 3) Interface testing
- 4) Compatibility testing
- 5) Performance testing
- 6) Security testing

#1) Functionality Testing

Test for – all the links in web pages, database connection, forms used for submitting or getting information from the user in the web pages, Cookie testing etc.

Check all the links:

- Test the outgoing links from all the pages to specific domain under test.
- Test all internal links.
- Test links jumping on the same pages.
- Test links used to send email to admin or other users from web pages.

- Test to check if there are any orphan pages.
- Finally, link checking includes, check for broken links in all above-mentioned links.

Test forms on all pages:

Forms are an integral part of any website. Forms are used for receiving information from users and to interact with them. So what should be checked in these forms?

- First, check all the validations on each field.
- Check for default values of the fields.
- Wrong inputs in the forms to the fields in the forms.
- Options to create forms if any, form delete, view or modify the forms.

Let's take an example of the search engine project currently I am working on, in this project we have advertiser and affiliate signup steps. Each sign-up step is different but its dependent on the other steps.

So sign up flow should get executed correctly. There are different field validations like email Ids, User financial info validations etc. All these validations should get checked in manual or automated web testing.

Cookies Testing:

Cookies are small files stored on the user machine. These are basically used to maintain the session- mainly the login sessions. Test the application by enabling or disabling the cookies in your browser options.

Test if the cookies are encrypted before writing to the user machine. If you are testing the session cookies (i.e. cookies that expire after the session ends) check for login sessions and user stats after the session ends. Check effect on application security by deleting the cookies. (I will soon write a separate article on cookie testing as well)

Validate your HTML/CSS:

If you are optimizing your site for Search engines then HTML/CSS

validation is the most important one. Mainly validate the site for HTML syntax errors. Check if the site is crawlable to different search engines.

Database testing:

Data consistency is also very important in a web application. Check for data integrity and errors while you edit, delete, modify the forms or do any DB related functionality.

Check if all the database queries are executing correctly, data is retrieved and also updated correctly. More on database testing could be a load on DB, we will address this in web load or performance testing below.

In testing the functionality of the websites the following should be tested:

Links

- i. Internal Links
- ii. External Links
- iii. Mail Links
- iv. Broken Links

Forms

- i. Field validation
- ii. Error message for wrong input
- iii. Optional and Mandatory fields

Database

Testing will be done on the database integrity.

#2) Usability Testing

Usability testing is the process by which the human-computer interaction characteristics of a system are measured, and weaknesses are identified for correction.

- Ease of learning
- Navigation

- Subjective user satisfaction
- General appearance

Test for navigation:

Navigation means how a user surfs the web pages, different controls like buttons, boxes or how the user uses the links on the pages to surf different pages.

Usability testing includes the following:

- The website should be easy to use.
- Instructions provided should be very clear.
- Check if the instructions provided are perfect to satisfy its purpose.
- The main menu should be provided on each page.
- It should be consistent enough.

Content checking:

Content should be logical and easy to understand. Check for spelling errors. Usage of dark colors annoys the users and should not be used in the site theme.

You can follow some standard colors that are used for web page and content building. These are the commonly accepted standards like what I mentioned above about annoying colors, fonts, frames etc.

Content should be meaningful. All the anchor text links should be working properly. Images should be placed properly with proper sizes.

These are some of the basic important standards that should be followed in web development. Your task is to validate all for UI testing.

Other user information for user help:

Like search option, sitemap also helps files etc. The sitemap should be present with all the links in websites with a proper tree view of navigation. Check for all links on the sitemap.

“Search on the site” option will help users to find content pages that they are looking for easily and quickly. These are all optional items and if present they should be validated.

#3) Interface Testing

In web testing, the server side interface should be tested. This is done by verifying that communication is done properly. Compatibility of the server with software, hardware, network, and the database should be tested.

The main interfaces are:

- Web server and application server interface
- Application server and Database server interface.

Check if all the interactions between these servers are executed and errors are handled properly. If database or web server returns an error message for any query by application server then application server should catch and display these error messages appropriately to the users.

Check what happens if the user interrupts any transaction in-between?
Check what happens if the connection to the web server is reset in between?

#4) Compatibility Testing

Compatibility of your website is a very important testing aspect. See which compatibility test to be executed:

- Browser compatibility
- Operating system compatibility
- Mobile browsing
- Printing options

Browser compatibility:

In my web-testing career, I have experienced this as the most influencing part of web site testing.

Some applications are very dependent on browsers. Different browsers have different configurations and settings that your web page should be compatible with.

Your website coding should be a cross-browser platform compatible. If you are using java scripts or AJAX calls for UI functionality, performing security checks or validations then give more stress on browser compatibility testing of your web application.

Test web application on different browsers like Internet Explorer, Firefox, Netscape Navigator, AOL, Safari, Opera browsers with different versions.

OS compatibility:

Some functionality in your web application is that it may not be compatible with all operating systems. All new technologies used in web development like graphic designs, interface calls like different API's may not be available in all Operating Systems.

Hence test your web application on different operating systems like Windows, Unix, MAC, Linux, Solaris with different OS flavors.

Mobile browsing:

We are in the new technology era. So in future Mobile browsing will rock. Test your web pages on mobile browsers. Compatibility issues may be there on mobile devices as well.

Printing options:

If you are giving page-printing options then make sure fonts, page alignment, page graphics etc., are getting printed properly. Pages should fit to the paper size or as per the size mentioned in the printing option.

#5) Performance testing

The web application should sustain to heavy load. Web performance testing should include:

- Web Load Testing
- Web Stress Testing

Test application performance on different internet connection speed.

Web load testing: You need to test if many users are accessing or requesting the same page. Can system sustain in peak load times? The site should handle many simultaneous user requests, large input data from users, simultaneous connection to DB, heavy load on specific pages etc.

Web Stress testing: Generally stress means stretching the system beyond its specified limits. Web stress testing is performed to break the site by giving stress and its checked as for how the system reacts to stress and how it recovers from crashes. Stress is generally given on input fields, login and sign up areas.

In web performance, testing website functionality on different operating systems and different hardware platforms is checked for software and hardware memory leakage errors.

Performance testing can be applied to understand the web site's scalability or to benchmark the performance in the environment of third-party products such as servers and middleware for potential purchase.

Connection Speed

Tested on various networks like Dial-Up, ISDN etc.

Load

- i. What is the no. of users per time?
- ii. Check for peak loads and how the system behaves
- iii. Large amount of data accessed by user

Stress

- i. Continuous Load
- ii. Performance of memory, CPU, file handling etc..

#6) Security Testing

Following are some of the test cases for web security testing:

- Test by pasting internal URL directly into the browser address bar without login. Internal pages should not open.
- If you are logged in using username and password and browsing internal pages then try changing URL options directly. I.e. If you are checking some publisher site statistics with publisher site ID= 123. Try directly changing the URL site ID parameter to different site ID which is not related to the logged in user. Access should be denied for this user to view others stats.
- Try some invalid inputs in input fields like login username, password, input text boxes etc. Check the system's reaction to all invalid inputs.
- Web directories or files should not be accessible directly unless they are given download option.
- Test the CAPTCHA for automating script logins.
- Test if SSL is used for security measures. If it is used, the proper message should get displayed when user switch from non-secure HTTP:// pages to secure HTTPS:// pages and vice versa.
- All transactions, error messages, security breach attempts should get logged in log files somewhere on the web server.

The primary reason for testing the security of a web is to identify potential vulnerabilities and subsequently repair them.

- Network Scanning
- Vulnerability Scanning
- Password Cracking
- Log Review
- Integrity Checkers
- Virus Detection

Points to be considered while testing a Website

The websites are essentially **client/server applications** – with web servers and 'browser' clients.

Consideration should be given to the interactions between **HTML pages, TCP/IP communications, Internet connections, firewalls, applications that run in web pages** (such as applets, javascript, plug-in applications) and **applications that run on the server side** (such as CGI scripts, database interfaces, logging applications, dynamic page generators, asp, etc.).

Additionally, there are a wide variety of servers and browsers with various versions of each. They include small but sometimes significant differences between them in terms of variations in connection speeds, rapidly changing technologies, and multiple standards & protocols. The end result of which testing for websites can become a major ongoing effort.

Sample test scenarios for testing a web application

Few other considerations to be included while testing a website are given below.

- What is the expected load on the server (e.g., number of hits per unit time)?
- What kind of performance is required under each load condition (such as web server response time, database query response times)?
- What kind of tools will be required for performance testing (such as web load testing tools, other tools already in house that can be adapted, web robot downloading tools, etc.)?
- Who is the target audience? What kind of browsers will they be using? What kind of connection speeds will they be using? Are they intra-organizations (thus likely with high connection speeds and similar browsers) or Internet-wide (thus with a wide variety of connection speeds and browser types)?
- What kind of performance is expected from the client side (e.g., how fast should pages appear, how fast should animations, applets, etc. load and run)?
- Will the downtime for server and content maintenance/upgrades be allowed? If so, then how much?

- What kind of security (firewalls, encryption, passwords, etc.) will be required and what is it expected to do? How can it be tested?
- How reliable is the site's Internet connections required to be? And how does that affect the backup system or redundant connection requirements and testing?
- What process will be required to manage updates to the web site's content?
- What are the requirements for maintaining, tracking, and controlling page content, graphics, links, etc.?
- Which HTML specification will be adhered to? How strictly? What variations will be allowed for targeted browsers?
- Will there be any standard requirements for page appearance and/or graphics throughout a site or parts of a site??
- How will internal and external links be validated and updated? And how often? will it happen?
- Can testing be done on the production system, or will a separate test system be required?
- How are browser caching, variations in browser option settings, dial-up connection variability, and real-world internet 'traffic congestion' problems to be accounted for testing?
- How extensive or customized are the server logging and reporting requirements; are they considered as an integral part of the system and do they require testing?
- How are CGI programs, applets, javascript, ActiveX components, etc. to be maintained, tracked, controlled, and tested?
- Pages should be 3-5 screens max unless the content is highly focused on a single topic. If larger, provide internal links within the page.
- The page layouts and design elements should be consistent throughout a site so that it's clear to the user that they are still on a site.
- Pages should be as browser-independent as possible, or pages should be provided or generated based on the browser-type.
- All pages should have links external to the page; there should be no dead-end pages.

- The page owner, revision date, and a link to a contact person or organization should be included on each page.