

Web Testing

Introduction

Making a web site does not end with putting all the media and software together. Actually, web site work never ends. When all the design is done, you have to test the site first before sending it to the World Wide Web for the world to see. There is **site management software** that can do this for you. These software can help reconnect graphics that may have been accidentally moved, change the name of a file and re-link it and so many other things.

Aside from the site management software, you also have to the quality of your website. Your site has to be tested, fixed, retested and fully documented. If any there's any software running on your website (which you most probably will), this has to be tested. Some of the things that have to be checked for quality assurance are multiple browser compatibility, download time of graphics, Flash components, or streaming media, hardware requirements, memory size requirements, connection speed of user, and load (number of users your website can accommodate). There are many companies now that are developing software specifically for quality assurance. But this software is expensive. Usually, e-commerce sites are load tested as they have a great deal of software running on their sites.

Some of the other test types are functional tests (makes sure features work), stress tests (site is tested on computers with different hardware specifications), regression tests (defines how site will be tested in the next phases), boundary analysis (tests the limitations of site such as entering information in forms) (Burdman,1999). Sometimes the best way to test your site is by having an actual person go through your site and let him tell you the problems he encountered. These people are usually called testers. Some of these software run test that simulate testers.

Significance of the Study

How important is it to test your website before going live? Site testing is essential so that every aspect of your website is functioning, especially software. Site testing ensures that there are no broken links, no missing graphics, no misspelled words, no bugs in the software, and that download time is as specified. There are many software out there that do the site testing for you. I will tackle only a few here that were recommended by experts. This will give an insight on how the software works and how extensive the testing is.

Discussion

What is website quality?

There are thousands of websites launched every year and nothing is worse than a poorly operating website. Website testing is most important to e-commerce sites since they have applications running on the website that may affect their sales or operations. So how should websites be tested? What are the measures of quality? Here are some of the measures of quality according to Miller:

1. Timeliness – WebPages have to be upgraded constantly. When was it last upgraded? How consistent is it to today's news or information?
2. Structural Quality – All the parts of the website have to be working well. Are all the links (inside or outside) working? Are all the images loading?
3. Content – This does not only concern spell checking, proofreading but also the consistency of the contents with either all of the other pages or with the request of the user, especially with dynamic web pages. Does the content of critical pages match what is supposed to be there? Do key phrases exist continually in highly-changeable pages? Do critical pages maintain quality content from version to version?

4. Accuracy and Consistency – Are the pages consistent with what the user requested? How consistent is the webpage with yesterday's webpage?
5. Response Time and Latency – This is most essential with e-commerce sites. The response time of the server should be fast after clicking SUBMIT. Does the Website server respond to a browser request within certain performance parameters? Are there parts of a site that are so slow the user discontinues working?
6. Performance – This involves performance by load or usage. Is the webpage loading in less than eight seconds? Can your system handle 10,000 transactions per minute?

Quality of the website is very important for the user. A website with too many broken links, defective images, may cost a lot for an e-commerce website. Users will quickly leave for a different site if the website is too complex and of low quality.

What to test?

Content Checking

The website has to be tested for accuracy, completeness, consistency, spelling and accessibility (Stout, 2001). These areas are the first things judged by the user. Users must have the best possible experience with your website. Even just a faulty image can create a bad impression on the user and may not visit your site again.

Testing for this is very simple and as straightforward as they are. Tests for content may not be the first thing in the designer's mind but it is the most important of all the tests.

Browser Compatibility

There are a number of different browsers and browser options. A website has to be designed to be compatible for a majority of the browsers. This still leaves room for creativity. Even with Microsoft's Internet Explorer and Netscape's Navigator this is an issue because of the different versions people are or still are using (Gerrard, 2000b).

The graphics and other objects on a website have to be tested on multiple browsers. If more than one browser will be supported then the graphics have to be visually checked if there are differences in the physical appearance. Some of the things to check are centering of objects, table layouts, colors, monitor resolution, forms, and buttons.

The code that executes from the browser also has to be tested. There are different versions of HTML. They are similar in some ways but they have different tags which may produce different features. Some of the other codes to be tested are Java, JavaScript, ActiveX, VBscripts, Cgi-Bin Scripts and Database access. Cgi-Bin Scripts have to be checked for "end-to-end" operations and is most essential for e-commerce sites. The same goes for database access. The website has to be tested in each supported browser and must also be checked for multiple browser's renderings and responses.

To check all of these components, test browsing needs to be done. The purpose of this test is to find flaws in the navigation of the web pages. This includes checking for broken links, faulty graphics, download speed of each page (over a variety of internet connections). The load times of all objects must be within an acceptable time. The user must still be able to browse the site even if the "images-load" option is turned off. Other components to check are the scripts and plug-ins. Will the site still work if JavaScript or Java is disabled or if a certain plug-in is not loaded (Smith, 2001)? How fast and reliable is the interaction between the user and the page on the Web (Miller, 2000)?

Transaction Testing

This is very critical in an e-business application. The software a website is utilizing has to be forced to invoke its various components and whether the direct and indirect interfaces work correctly. The information entered by the user should make it to the database in the proper ways. When the user calls for information contained in the database, the proper data must be returned.

Configuration Testing

This test involves the operating systems platforms used, the type of network connection, the type of internet service provider, and the browser used. The development team must have these in mind so that there will be very little changes to be made if any. Also, the test environment must be properly configured for all these considerations.

Usability

Designers should always remember that the experience of the user in their website must be as pleasant as possible. How the user interacts with the website is very important. There may be cases when the user is someone very familiar with website browsing but not necessarily a testing expert.

There are standards and guidelines for tests for usability. However, designers and/or project managers should not rely on them too much since complying with these standards doesn't necessarily ensure that the site will meet the needs of the users, their tasks and their work environments. Design guidelines must be set and they must be measurable so that they can be easily incorporated into the tests.

Performance and Scalability

This test validates that the system meets performance requirements. This involves the download time of a page or the number of transactions the system can handle. How fast the website host responds has an effect on whether a user stays or leaves. Usually, there is a dedicated performance-testing server. This server must be an exact copy of the production server (Hagen, 2000). Performance testing can be done from the browser or directly from the server. But testing from the browser has its limitations. The performance time that the browser takes may not be measured if tested from the server.

Scalability is defined as the web application's capacity to sustain the number of concurrent users and/or transactions, while sustaining sufficient response times to its users. Configuration of the test server is also critical in scalability testing as with performance testing. To test scalability, web traffic loads must be determined in order to obtain the threshold requirement for scalability should be. Sometimes, existing traffic levels are used to simulate the load.

Security

Security is critical for e-commerce websites. Tests for security are often broken into two categories: testing the security of the infrastructure hosting the Web application and testing for vulnerabilities of the web application. Some of the things that should be considered for infrastructure are firewalls and port scans. For vulnerabilities, there's user authentication, cookies to name a few.

Data collected must be secured internally. Users should not be able to browse through the directories in the server. A cookie is a text file on a user's system that identifies the user. Cookies must always be encrypted and must not be available to other users.

Sample Software to Use

eValid

eValid is a software developed by Software Research, Inc. It is a test engine that provides client side quality checking. Test and analysis are done inside of the eValid's test browser. Some of the services the engine provides are site analysis (reports broken links, slow loading, and complex pages), timing/tuning (points to which pages are slowing down performance), Functional Testing and Validation (works on the different codes in the page), Server Loading (simulates loads on the website using real browsers), Monitoring (monitor everything that goes on in the website). The eValid test engine is available in several product configurations.

For more information about eValid, check out <http://www.soft.com/eValid/evindex.html>

iOpus Internet Macros

Internet Macros is a web scripting engine. The Pro and Scripting editions are for web testing. This software tests a website or the software it uses repeatedly to ensure that all the bugs have been fixed, especially when new code is incorporated. It can also automate search engine submissions, monitor a website and alert the webmaster if any of the codes do not work, measure website response times. This software also simulates Microsoft's Internet Explorer.

For more information about Internet Macros, check out <http://www.iopus.com/iim.htm>

WebLOAD, WebFT, and WebGTS

WebLOAD, WebFT and Web GTS are products of RadView Software, Inc. used mostly for e-business solutions. WebLOAD is a software for testing applications on the web for performance and scalability. This is done by simulating real-world scenarios like Internet

user capacity, traffic patterns, peak loads, change of activities, to name a few. The software measures the performance and gives out a report.

WebFT is used for functional testing. It allows you to verify properties and attributes on three levels: global, page and object. It creates test scripts automatically so this allows the developer more time for resolving the problem.

WebGTS is a global testing service that tests and deploys a website. Some of the services include test planning, test execution, test data analysis, and agenda script generation.

For more information about these products, visit <http://www.radview.com>

Other Services

There are many companies out there offering web testing services. It would be too much to name all of them in this paper but here are a few, most of them are for e-business solutions:

Mercury Interactive (<http://www.mercuryinteractive.com>) Optimizing business and technology performance.

BEA Systems (<http://www.bea.com>) One of the world's leading e-business infrastructure software companies.

Citrix (<http://www.citrix.com>) Offers services for application serving and portal software. These services let developers manage applications from a virtual workspace.

Oracle (<http://www.oracle.com/appsnet>) Provides enterprise software for business. Oracle has a number of software for testing systems and applications and for other e-business solutions.

Summary

Site management software is very essential for testing a website before getting it live. Your site has to be tested, fixed, retested and fully documented. Any applications utilized in the website have to be tested for performance and scalability.

The criteria for testing websites are: Timeliness, Structural Quality, Content, Accuracy and Consistency, Response Time and Latency, and Performance. Some of the tests that need to be done on a website are Content Checking, Browser Compatibility, Transaction Testing, Configuration Testing, Performance and Scalability, and Security

Web testing is still just evolving because software used in the web are relatively new to other software. Software testing has been around for a long time. But there are many companies making software for web testing. A developer need only choose one that meets his needs and his budget.

A developer's job isn't finished after the designing and encoding. Web testing is a very critical part of website development.

References

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Related Links

- eValid, a web testing tool: <http://www.soft.com/eValid/evindex.html>
- Technology Solutions: http://www.techsolsc.com/web_design.html
- Mike's Website TESTING, Promotion and Marketing Software info page: <http://www.website-testing.info/>
- Interview with Steven Splaine: <http://www.ibizinterviews.com/stevens1.htm>
- Site Point: Beginner's Corner: <http://www.webmasterbase.com/subcats.php?id=43>
- Mercury Interactive Corporation: <http://www-svca.mercuryinteractive.com/products/>
- Mercury Interactive Alliances: <http://www-heva.mercuryinteractive.com/alliances/>
- iOpus Internet Macros: <http://www.iopus.com/iim.htm>

RadView Software: <http://www.radview.com/default.asp>

All Things Web: <http://www.pantos.org/atw/testing.html>

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