



A Perspective on Web Testing

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Objective

The purpose of this presentation is to depict a perspective on Web centric application testing. The document concentrates only on describing importance of web testing, how to conduct web testing and automation of web testing.

The importance of Web Testing is growing phenomenally as the importance and implementation of Web applications is taking place in a rapid speed in each and every company's applications.

Web application advantages?

The foremost advantage of Web application is it reduces physical distance between user and the application near to zero. Web application can be accessed from anywhere and anytime by anyone around the world.

E-COMMERCE applications like B2B, B2C and market places are the most promising web application as E-COMMERCE is yet to be part of life of the entire world

Hence the significance of Web Testing is growing tremendously. Due to enormous growth in number of web applications the site needs to be not only user friendly but also reader friendly to attract more users repeatedly.

What is Web Testing?

1. Web Testing is the process of testing Web centric applications.
2. Web Testing involves more dimensions, less time, higher risks to include tests for performance, usability and compatibility than client/server applications etc. An optimal Web Testing approach begins with a thorough risk analysis of your application to identify and prioritize key areas and testing tasks.



Why web test?

We site deadlines are often far shorter than anyone would like.

“Web software testing costs time and money.” &

“Web Software testing saves time and money.”

Both of these statements are true. The equation, however, cannot be completed without the word “effective”. With effective Web testing, the net result is *always* time and money savings. The chart below illustrates the geometric increase in cost incurred if testing is not sufficient.

How Web Testing distinguish traditional Software Testing?

Software Testing was never easy.

But in Web arena the testing became more complex and challenging.

Today the users of web applications are not only limited but also users from all parts of the world.

With Web based applications the world is moved into the living rooms.

Which distinguishes the web applications from Client-server applications?

1. Performance due to concurrent users
2. Compatibility
3. Robustness
4. Continuous testing
5. Security and user authentication

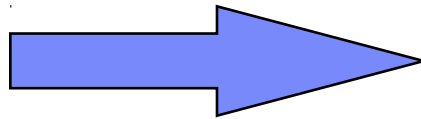
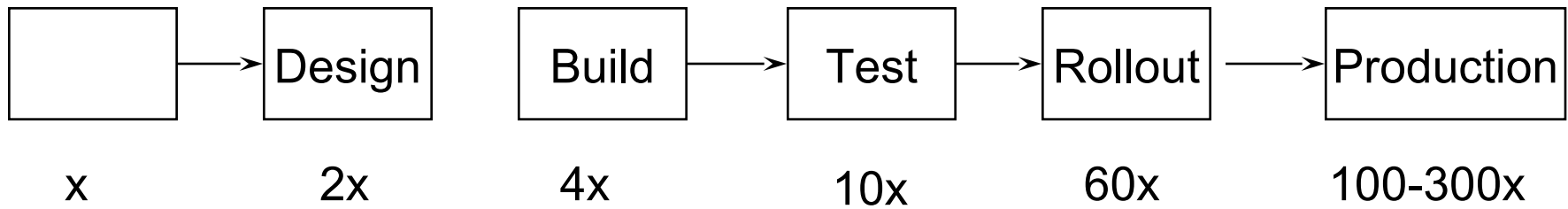
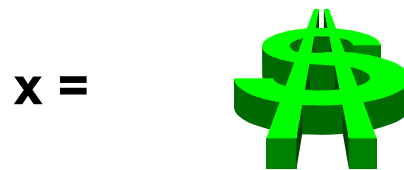
How to test Web applications?

Automated Vs Manual Testing

- The automated testing is becoming more important and influential in the web application testing.
- While testing the web application
 1. load testing,
 2. stress testing and
 3. performance testing cannot be done efficiently if we test manually. Manual testing cannot be possible to test the web site response time when 100 users access the site concurrently.
- But there is no automated testing tool, which supports 100% web testing. Web testing should be combination of manual and automated testing.

Cost of fixing web errors

The relative cost of correcting errors escalates by a factor of two between consecutive stages of a project.



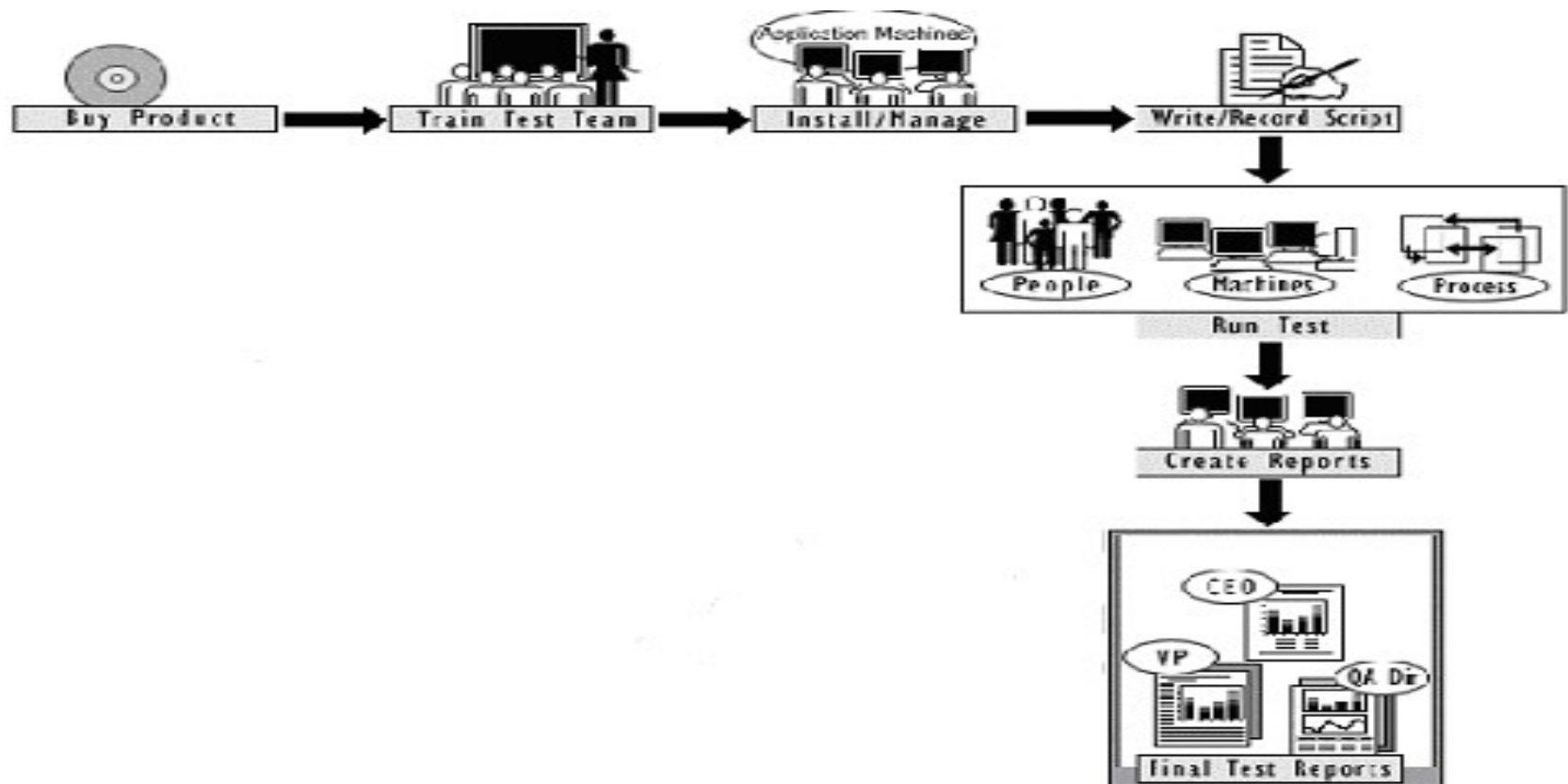
Here is the basic paradigm for GUI-based automated testing

- Design a test case, then run it.
- If the program fails the test, write a bug report. Start over after the bug is fixed.
- If the program passes the test, automate it. Run the test again (either from a script or with the aid of a capture utility). Capture the screen output at the end of the test. Save the test case and the output.
- Next time, run the test case and compare its output to the saved output. If the outputs match, the program passes the test

Advantage of automated testing

- Defects are caught early in the development cycle before they become costly.
- Time can be spent extending test coverage rather than repeating manual tests.
- The skill level required to run tests is reduced.
- Fixes are easier to verify because the scenarios that created them are automated.
- Full regression testing can be performed on each target platform.
- Metrics can be automatically gathered.

Following diagram explains the automated web testing process.



User Interface testing

User Interface testing includes verifying the Web user Interface with respect to UI specifications. The testing should verify that the UI built is as per UI specifications.

Following tools are available UI testing

1. Rational Robot
2. QA Partner by Segue Software and
3. Xrunner and WinRunner by Mercury Interactive.

Functionality

The functionality test should make sure that the application behaves as per design specifications dead link testing, Navigation, HTML validation Spell check and Content

1. Rational Suite TestStudio (Functionality testing)
2. Xenu Link Sleuth software (For Link testing)
3. <http://www.w3c.org> (For HTML validation)
4. [SilkTest International](#) (Functionality testing)
5. Compuware WebCheck –(Web test tool can check links, site mapping, orphaned URL's , missing attributes; scans for over 50 types of web site problems)
6. Doctor HTML (Site with online web page checker by Imagiware. Checks spelling, forms, table structure, form structure, tag usage. Validates links.)

Compatibility : minimal OS and browsers to be tested

Compatibility testing is necessary to ensure that the site performs same and as intended across multiple operating systems and different browser configurations.

Operation Systems: Windows 95, 98, NT and 2000 and XP and Mac OS 7.6.1 – 9, UNIX, Linux so on.

Browsers: Web site to be tested from Netscape 3.0 - 6, IE 3.0 - 5.0, AOL 3.0 - 5.0, as well as other browsers for both Windows and Macintosh platforms.

Following testing tools can be used for Compatibility

1. VeriTest (Compatibility Testing)

Performance testing

Performance testing of web sites required sophisticated automating tools due to manual tests couldn't simulate the testing conditions like maximum users

There are numerous situations when famous sites like www.msnbc.com, www.cnn.com faced performance problems apart from their preparedness to meet the maximum traffic.

Predictable events like and unpredictable events like

1. Olympic games or
2. Football world cup where famous sites are flood with heavy traffic and the web applications also needs to gear for some
3. Sept 11 2001 attack on WTC in New York. Many sites were down due unexpected users accessed the sites on Sept 11th

There are numerous situations

1. For example On 12 February 2002, MSNBC.com, NBCOlympics.com and Olympics.com handled as many as 260,000 concurrent users.
2. MSNBC and KeyLabs predicted and planned for heavy site traffic by using RadView WebLOAD application testing and analysis software. MSNBC normally handles 15 million pages of information per day but ran at 30 million to 40 million per day during the first week of the Olympics.

The performance testing includes following testing

1. Load testing:

The Load testing determines the system performance at maximum usage levels. The measure of transaction times during load testing is not as important how far a system can be pushed until it fails.

2. Stress testing:

Stress testing runs or stresses a web application under heavy loads for sustained periods Stress testing determines when the performance of a system degrades over a period of time.

Security

1. The security is very important psychological factor while retaining or attracting more users to visit the site. Especially E-Commerce related applications should be geared for users to protect the users confidential information like credit card information, address, contact information and so on.

For additional security and encryption, check to see if the Secure Sockets Layer (SSL) protocol is being used.

Following tools can be used for security testing:

1. [Entrust](#) (Securing the Internet)
2. ActiveTest Secure Check (Security testing service for web applications)

Usability & Error handling testing

1. For a large number of products, it is believed that the usability becomes the final arbiter of quality. This is true for a large number of desktop applications that gained market share through providing a good user experience.
2. Error handling strategy to be tested thoroughly as the end user should not feel uneasy due to the error message displayed while browsing the site or submitting a web form if any error occurs. The error message and the way message displayed should be user friendly.
3. The error message should be meaningful and appropriate

Network testing

Tests need to be run to ensure that a site is network able and can run on several network OS environments. Also stress tests is needed to ensure that a minimum number of users can use an application at one time

White box testing Vs Black box testing

The manual testing can be done in following well-known software testing techniques. Manual testing can be done wherever web test automation is not possible or feasible.

- 1. White box testing** :Use White box testing to test the site's construction. White box testing in software development involves exercising all possible paths.
- 2. Black Box testing** : Black box testing can be used to test the site's functionality. Black box testing helps ensure that a program performs the way it was expected to function. In dynamic Web sites, the states of pages are constantly changing depending on how user visits a site.

Analysis of web testing results

Many of the automated web tools provide test results in different forms of presentations. The analysis of these results is very important in improving the web site performance by understanding the areas of improvement. There are lots of options available to improve the performance if problem domain area is identified. Hence the web test result analysis is foremost important activity to improve the web site popularity.

Tips for Web testing

1. The figures below represent total page size, including both text *and* graphics:
2. The 0-10K range qualifies as *exemplary*
3. Pages between 10-20K rate as *well-optimized*
4. The 20-40K range is merely *adequate*
5. 40-60K pages earn a *dubious* designator
6. Anything over 60K is *unacceptable*

What should be the optimal Download time?

1. Download Time = 0.1 Second-When a Website operates as quickly as this, it appears to happen instantly to the user..
2. Download Time = 1 Second-If the site operates this quickly, the user won't have a chance to focus their attention somewhere else.
3. Download Time = <15 Seconds-This amount of time is accepted to be the threshold for keeping the user's attention focused.
4. Download Time - >15 Seconds -Over 15 seconds is considered to be too long to keep the user's attention focused, and they're likely to lose interest and do other things.

Web testing checklist

Following checklist is useful for web testing

.A perspective on Web Testing\Web Testing Checklist.doc

User Testing Techniques

Following checklist is useful for web testing

User Testing Techniques

Vendors Of Web Testing tools

Following are the list of renowned companies famous in supplying Web Testing tools.

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Conclusion

Website testing is a very important part of web site development and subsequent maintenance. Whether it be an assessment completed during development, or the analysis of your impact on the audience after you've launched the site, testing is vital. It can save any good Websites from failing to satisfy their visitors.

References

What should a Test to be automated? By Brain Marick for Quality week magazine.

WebSite testing by Edward Miller of Software Research inc.



Thanks for your Attention!!

Keep eXploring