



## International Journal of Marketing and Technology

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Title

**THE REVIEW FOR WEB-PAGE TESTING AND  
QUALITY ASSURANCE**

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**Abstract:**

Testing is one of the critical processes in software development life cycle. It plays a vital role in the success of software product by enhancing its quality. Now days web-based applications are emerging and evolving speedily. Software testing is the execution of software with actual test data which produce expected results. To do the testing of software it is necessary to know which type of the test case plan should be used and how many types of test cases are necessary. With the test case it is necessary which type of testing is used. Software quality assurance is the set of activities that ensures software processes and products conform to requirements and standards. In this paper, we will discuss different types of testing, software quality assurance related issues which is necessary for the development of a website. Quality Assurance makes sure the project will be completed based on the previously agreed specifications, standards and functionality required without defects and possible problems. It monitors and tries to improve the development process from the beginning of the project to ensure that it is working properly.

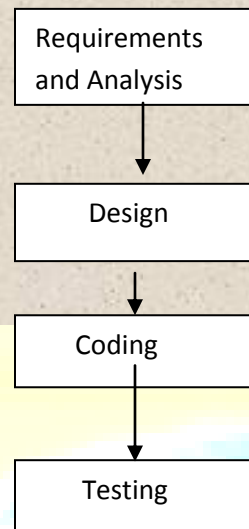
**Keywords:** Software, Requirements, Testing, Quality ,Web, Phases, Bugs, Assurance.

**Introduction:**

Software testing is an investigation to check the requirements in the product according to the customer. To make the software error free, testing is necessary. Website testing is also used to maintain the quality of the webpage of website. Testing is a process of identifying errors between actual and expected results. It also reduces the risks of software implementation. It also reduces the maintenance cost.

Software testing, depending on the testing method employed, it can be implemented at any time in the development process. However, most of the test effort occurs as per the life cycle after the requirements have been defined and the coding process has been completed. (Fig.1).

Testing phase comes after the coding phase. Testing is used to ensure that the particular code/product is working properly or not.



**Fig.1: Life Cycle**

### **Overview:**

As the demand of Web applications is increasing rapidly, their complexities are also increasing, and reliability and quality assurance of these applications has become an important and critical task. Since the Web applications are heterogeneous in nature and different from conventional and traditional applications therefore quality assurance of such applications is not an easy task. The quality of Web applications is a complex, multidimensional attribute, and great effort is required to ensure the quality of the Web-based applications. Testing is a never ending process and it can never be completely identify all the defects within the product. but it gives a comparison that compares the state and behavior of the product. Every software has a target audience. For example, the audience for using the website which is totally different from other type of software. Therefore, when an organization develops or invests in the website, it can assess whether it will be acceptable to the end users or will it targets audience. Software testing is the process of attempting to make this assessment clear. The main goal of testing is to detect software failures so that defects may be discovered and corrected. Testing cannot establish that a product functions properly under all conditions but can only establish that it does not function properly under specific conditions. The scope of software testing often includes examination of code as well as execution of that code in various environments and conditions as well as examining the aspects of code: does it do what it is supposed to do and do what it needs to do.



The testing team and the development team are two different aspects in an organisation. There are various roles for testing team members. Information derived from software testing may be used to correct the process by which software is developed. QA is involved in the project from the beginning. This helps the teams communicate and understand the problems and concerns, also gives time to set up the testing environment and configuration.

Discussion about the testing for website to find that it is working properly or not, it is necessary to take some points in the mind related to risk and security .Any website should be designed to provide each of these needs:

- 1. Authentication:** It means obtaining a level of comfort with a proper identity of a user. The level of comfort is likely to differ with the value of the data and the risk it represents.
- 2. Authorization:** It means establishing entitlement based on the authentication performed.
- 3. Integrity:** Only the authorized user can access the web-page.
- 4. Non-repudiation:**It comprises control to prevent a party from denying the transaction.
- 5. Privacy:** It means controls to prevent unauthorized user from hacking the information

To do better testing a proper test plan is prepared. Firstly we know that what is test plan? Test Plan is a document that describes the objectives, scope, approach, and focus of a software testing effort. After preparing the test plan test case should be prepared A test case is a document that describes an input, action, or event and an expected response, to determine if a feature of an application is working correctly. A test case should contain particulars such as test case identifier, test case name, objective, test conditions/setup, input data requirements, steps, and expected results.

### **Software bugs and failures:**

It is not necessary that all websites do not work due to defects which are due to coding .It can be possible that this defects can be caused by un-necessary requirements designed by the programmer, that results in the form of errors. A common non-functional requirements are testability, scalability, maintainability, usability, performance, and security.



Software faults occur through the following processes. A programmer makes an error which results in a bug in the software source code. If this bug is executed, in certain situations the system will produce wrong results, causing a failure. Not all defects will necessarily result in failures. A bug can turn into a failure when the executing environment is changed. For example, if the software is being run on a new platform, a single bug can result in a wide range of failures.

### **Webpage verification and validation:**

- **Verification:** Have we built the software right? The process of evaluating software to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase. Validation ensures that the product actually meets the user's needs, and that the specifications were correct in the first place, while verification is ensuring that the product has been built according to the requirements and design specifications.
- **Validation:** Have we built the right software? The process of evaluating software during or at the end of the development process to determine whether it satisfies specified requirements. Validation ensures that 'you built the right thing'. Verification ensures that 'you built it right'. Validation confirms that the product, as provided, will fulfill its intended use.

From testing perspective:

- Fault - wrong or missing function in the code.
- Failure - the manifestation of a fault during execution.
- Malfunction - according to its specification the system does not meet its specified functionality.

### The Testing team:

Software testing can be done by software testers. Until the 1980s the term "software tester" was used generally, but later it was also seen as a separate profession. Regarding the periods and the different goals in software testing, different roles have been established: manager, test lead, test designer, tester, automation developer, and test administrator.

### Software quality assurance:

Software testing is a part of the software quality assurance process. In SQA, software process specialists and auditors are concerned for the software development process rather than just the artifacts such as documentation, code and systems. They examine and change the software engineering process itself to reduce the amount of faults that end up in the delivered software: the so-called defect rate.

What constitutes an "acceptable defect rate" depends on the nature of the software; A flight simulator video game would have much higher defect tolerance than software for an actual airplane.

Software testing is a task intended to detect defects in software by contrasting a computer program's expected results with its actual results for a given set of inputs. Quality assurance is the implementation of policies and procedures intended to prevent defects from occurring in the first place.

### Testing methods employed:

- **Black box testing:** We do not need to know the internal design in detail or have a good knowledge about the code for this test. It's mainly based on functionality and specifications, requirements.
- **White box testing:** This test is based on detailed knowledge of the internal design and code. Tests are performed for specific code statements and coding styles.

- **Unit testing:** The most micro scale of testing to test specific functions or code modules. Typically done by the programmer and not by testers, as it requires detailed knowledge of the internal program design and code. Not always easily done unless the application has a well-designed architecture with tight code, may require developing test driver modules or test harnesses.
- **Incremental integration testing:** Continuous testing of an application as new functionality is added. Requires that various aspects of an application's functionality be independent enough to work separately before all parts of the program are completed, or that test drivers be developed as needed. Done by programmers or by testers.
- **Integration testing:** Testing of combined parts of an application to determine if they function together correctly. It can be any type of application which has several independent sub applications, modules.
- **Functional testing:** Black box type testing to test the functional requirements of an application. Typically done by software testers but software programmers should also check if their code works before releasing it.
- **System testing:** Black box type testing that is based on overall requirements specifications. Covers all combined parts of a system.
- **End to End testing:** It's similar to system testing. Involves testing of a complete application environment similar to real world use. May require interacting with a database, using network communications, or interacting with other hardware, applications, or systems.
- **Sanity testing or smoke testing:** An initial testing effort to determine if a new sw version is performing well enough to start for a major software testing. For example, if the new software is crashing frequently or corrupting databases then it is not a good idea to start testing before all these problems are solved first.
- **Regression testing:** Re-testing after software is updated to fix some problems. The challenge might be to determine what needs to be tested, and all the interactions of the functions, especially near the end of the software cycle. Automated testing can be useful for this type of testing.
- **Acceptance testing:** This is the final testing done based on the agreements with the customer.

- **Usability testing:** Testing to determine how user friendly the application is. It depends on the end user or customer. User interviews, surveys, video recording of user sessions, and other techniques can be used. Programmers and testers are usually not appropriate as usability testers.
- **Recovery testing:** Testing to determine how well a system recovers from crashes, failures, or other major problems.
- **Security testing:** Testing to determine how well the system protects itself against unauthorized internal or external access and intentional damage. May require sophisticated testing techniques.
- **Compatability testing:** Testing how well software performs in different environments. Particular hardware, software, operating system, network environment etc. Like testing a web site in different browsers and browser versions.
- **Exploratory testing:** Often taken to mean a creative, informal software test that is not based on formal test plans or test cases; testers may be learning the software as they test it.
- **Ad-hoc testing:** Similar to exploratory testing, but often taken to mean that the testers have significant understanding of the software before testing it.
- **Context driven testing:** Testing driven by an understanding of the environment, culture, and intended use of software. For example, the testing approach for life critical medical equipment software would be completely different than that for a low cost computer game.
- **Comparison testing:** Comparing software weaknesses and strengths to competing products.
- **Alpha testing:** Testing of an application when development is nearing completion. Minor design changes may still be made as a result of such testing. Typically done by end users or others, not by programmers or testers.
- **Beta testing:** Testing when development and testing are essentially completed and final bugs and problems need to be found before final release. Typically done by end users or others, not by programmers or testers.
- **Mutation testing:** A method for determining if a set of test data or test cases is useful, by deliberately introducing various code changes (defects) and retesting with the original test

data/cases to determine if the defects are detected. Proper implementation requires large computational resources.

- **Performance testing:** Web application should sustain to heavy load. Web performance testing should includes Web Load Testing and Web Stress Testing
- **Database testing:** Data consistency is very important in web application. Check for data integrity and errors while you edit, delete, modify the forms or do any Data Base related functionality.
- **Acceptance testing:** It is performed by the customer, often in their lab environment on their own hardware, is known as user acceptance testing). Acceptance testing may be performed as part of the hand-off process between any two phases of developmentAlpha testing.
- **Boundary value analysis:** It is a software testing technique in which tests are designed to include representatives of boundary values. Values on the edge of an equivalence partition or at the smallest value on either side of an edge. The values could be either input or output ranges of a software component. Since these boundaries are common locations for errors that result in software faults they are frequently exercised in test cases. Which is very necessary to check the boundaries for log in page.
- **Monkey Testing:** It is a unit test that runs with no specific test in mind. The monkey in this case is the producer of any input. For example, a monkey test can enter random strings into text boxes to ensure handling of all possible user input or provide garbage files to check for loading routines that have blind faith in their data. The test monkey is technically known to conduct stochastic testing, which is in the category of black-box testing.

### **Conclusion:**

Software development is a process of dealing with various types of risks. These risks can be both technical or non technical or programmatic. The goal of software assurance is to reduce many of these types of risks. Yet there are many types of tools and techniques available to use for software testing but the best testing is a tester's creativity and experience. Testing is not only used to locate defects but also correct them. It is also used in the validation, verification process,

and reliability measurement of the software. Testing should be an integral component of the software process and it must be carried out throughout the life cycle.

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