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# A Comprehensive Study on Software Testing Techniques

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***ABSTRACT:*** ***Software testing is key to software quality assurance development. During complete software development, life cycle bugs, and errors can be added in phases. Every time software testing is a very tough and costly process to confirm the quality of the developed product. In manual testing, the tester makes particular test cases manually that are performed in a way to find the error/bugs. In automated testing technique, it is a very fast process as it is mostly done with machines with fewer humans involved in this software testing technique. This review paper aims to define the set of different emerging tools and methodologies. A software testing technique to test the software development process. The aim of this paper is to explore the "software development lifecycle" (SDLC) and its advantages. It is software testing is an advanced version through the help of safekeeping features, testing tools, security models, and most important test cases used in testing. Software security testing was measured as a practical responsibility by application creators. The future of software testing technique is to continue the feature of software testing it must check the safety of the application with the right technique. The final purposes of safety testing are to confirm the strength and to stop safety weaknesses to open the application.***

***KEYWORDS:*** ***Application, Software, Security, Technique, Software Testing.***

## 1. INTRODUCTION

Software testing is the most valuable role of software quality assurance (QA). Software testing is not a one-person job this is a teamwork job. It is a small and large size of complexity of software products under testing. Software testing is an order and step-by-step process of detecting errors and reducing effort and time. Software Testing is the most general and main part of software development manufacturing [1]. ST is a process of cost-consuming development. Software testing focuses on generally two methods which are individual authentication and validation. Software testing is combined in the whole software development life cycle (SDLC).

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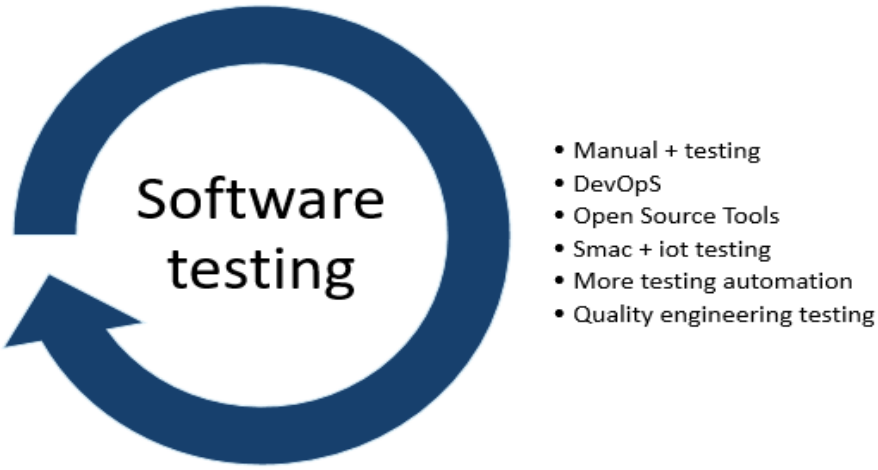


**Figure 1: Illustrate Software Testing in Different Areas.**

Software testing is a key to quality assurance of software development products with more user satisfaction, very low maintenance cost, and consistency. There are testing strategies that could be manual software testing or automated software testing. In manual testing, the tester makes test cases manually that are executed to catch the mistakes [2]. The software-automated testing technique is a very fast method as it is mainly done with a machine. Testing is the most important phase to confirm the quality of software testing development. The major reason to test is to catch errors in any type of software [3]. If no errors are created for development testing it can't speak confirmed that the software is bug-free and all define the software testing area in Figure 1.

*1.1 Software Testing Technique Principle:*

Software testing is a technique of implementing software or application to identify weakness or bugs. For software testing an application or software, need to define some principles to make our products weakness free, and that also helps the tester to engineers to test the software with your efforts and time [4]. Here in this principle are going to seven important principles of software testing.

1. Quick testing
2. Testing shows the presence of a problem
3. Complete testing is not possible
4. Virus detecting
5. Crowding defects
6. The testing technique is context-dependent
7. Absence of error mistake

*1.2 Existing Testing Methods:*

First of all, to create test cases. To confirm specific and effective testing, the test cases applying a variety of testing approaches are the three main testing methods [5].

*1.2.1 Black Box Testing:*

Black box testing is a type of technique to identify the features of the software without operation. Block box testing method can be implemented at each sequence of testing with the software

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development life cycle. This mostly performs the testing on every single feature of the software to control the originally specified supplies of the user. It defines the incorrect features of black-box testing. It is a very simple and easy common testing process to use worldwide [6].

### *1.2.2 Grey Box Testing:*

Grey box testing methods are a combination of black box and white box testing methods [7]. It is an advantage and services both are helping to gray box testing. In this testing, the tester will test the software is better methods to take inside the development of the software [8].

### *1.2.3 White box testing:*

This white box testing method is meaningful and active because it is a testing technique that scans more than one software similarly. Designing the test cases and using programming knowledge in the test cases are required for white box testing [9]. Similarly, white box testing is referred to as clear box or glass box testing. All testing levels, including unit, combination, and system testing, may use this testing approach. The security testing approach is another name for a security testing technique [10].

## 2 DISCUSSION

### *2.1 Software Security Testing:*

One of the key components of software quality is security testing. Software testing is secure when it responds to illegal attacks in a certified way. Software Security test methods are used to protect the safety of software. It will talk about security testing after moving on to other topics. Software security testing is a set of procedures used to confirm that computer code functions as planned. Software testing's primary goals are to ensure quality, evaluate a program's stability, or provide verification and validation. By using a variety of software, hardware, and networks, as well as encrypting the application, security testing is done to see if there are any security and privacy issues explained all security testing in Figure 2.

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**Figure 2: Illustrate security testing work in these areas.**

*2.2 Types of Software Testing:*

There are many types of security testing according to open-source security testing methodologies. All software security testing types.

a) Security scanning
b) Security testing
c) Security risk assessment
d) Weakness scanning
e) Access Testing
f) Ethical hacking
g) Easy Assessment

*2.3 Security Testing Life Cycle:*

To continue the feature of software testing it must check the safety of the application with the right technique. The final purposes of safety testing are to confirm the strength and to stop safety weaknesses to open the application. A software testing method is compulsory to confirm that the decided software can defend personally from several crucial attacks and weaknesses created by location. The security testing life cycle to improve in the future structure which confirms the frameworks of Software Testing. The next steps elaborate on this life cycle of software testing.

## 3 CONCLUSION

The software testing technique is an emerging trend. The complexity of today's software applications combined with the growing pressure from the competition has elevated the quality control of produced software to new heights. Software testing is a necessary component of the

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software development lifecycle, and due to its importance during the pre-and post-creation phases, it should be handled using advanced and effective processes. To increase quality assurance, this article will address both current and new testing methods. This paper studies the defined methods, tools, organization, and software security techniques and also includes a life cycle for ST. Major methods used in ST are defined and briefly explain. Software growth there mostly in contact between requirement testers and writers for good understanding and primary examination. The tester tests the software after hand over to the creators. The tester makes sure the main condition is seen before managing the project for official testing. The future scope of software testing must be maintained and must be checked the application's safety using the appropriate method. The ultimate goals of safety checks are to validate the stability and prevent safety vulnerabilities from opening the application.

**REFERENCES:**

[1] A. A. Sawant, P. H. Bari, and P. . Chawan, "Software Testing Techniques and Strategies," *J. Eng. Res. Appl.*, 2012.

[2] S. Farooq and S. Quadri, "Evaluating the effectiveness of software testing techniques with emphasis on enhancing software reliability," *J. Emerg. trends Comput. Inf. Sci.*, 2011.

[3] K. Mohd. Ehmer, "Different forms of software testing techniques for finding errors," *Int. J. Comput. Sci. Issues*, 2010.

[4] K. Sneha and G. M. Malle, "Research on software testing techniques and software automation testing tools," 2018, doi: 10.1109/ICECDS.2017.8389562.

[5] S. Roohullah Jan, S. Tauhid Ullah Shah, Z. Ullah Johar, Y. Shah, and F. Khan, "An Innovative Approach to Investigate Various Software Testing Techniques and Strategies," *Int. J. Sci. Res. Sci. Eng. Technol.*, 2016.

[6] I. Hooda and R. Singh Chhillar, "Software Test Process, Testing Types and Techniques," *Int. J. Comput. Appl.*, 2015, doi: 10.5120/19597-1433.

[7] F. Latif, S. Nazir, S. Sarwar, A. Mohsen, and A. Saboor, "Optimized Order of Software Testing Techniques in Agile Process – A Systematic Approach," *Int. J. Adv. Comput. Sci. Appl.*, 2017, doi: 10.14569/ijacsa.2017.080144.

[8] R. Jampani, N. Talasu, R. Manjula, and A. B. B. Testing, "Survey of Software Testing Techniques," *Int. J. Res. Appl. Sci. Eng. Technol.*, 2016.

[9] M. Kaur and R. Singh, "A Review of Software Testing Techniques," *Int. J. Electron. Electr. Eng.*, 2014.

[10] S. Jat and P. Sharma, "Analysis of Different Software Testing Techniques," *Int. J. Sci. Res. Pap. Comput. Sci. Eng.*, 2017.