

Study of Different Aspects of Software Testing and Problem Analysis in Security Issues in Project Development

Dr. Halkar Rachappa
Asst. Prof. & Head Dept. of Computer Science
SGRCM Govt. Commerce & Management College, BALLARI
(Karnataka)

Abstract: Software is a term, which referred information or program which is used by a computer. There is a rapidly growth in the software field so the software testing is becoming an important part in the field of software industry. Software testing is an important part in the software field, which is an ancient term used in this field. Software testing is used in the software field for determining the quality of the software. Automatic methods are used for ensuring the software correctness range from static techniques to dynamic technique. In static technique model checking or static analysis is used for checking the software. In these technique there has some strengths & some weaknesses like, model checking is automatic & exhaustive but has scalability issues. Static technique scales to very large program but gives to many false warnings.

Keywords-Software Testing, Testing methods, digital computers, manual testing, automatic testing

I. INTRODUCTION

Software testing is very old in the field of digital computers. It is an important aspect of assessing the software for checking its quality. It is a significant part of software engineering. As we know the development in the field of languages like Fourth Generation Language (4GL) that boosted the implementation process, so software testing part is also increase. As the maintenance and up gradation of systems is increasing, the amount of testing is also needed to verify.[1]

A system is needed to be check before it is used. So Testing of that system is a very effective to assure the quality of the software. So the Testing of a software is become an important research area. It has following parts:

1) Process: Testing is a process of checking the quality & reliability of a system, rather than a single activity.

2) All Life Cycle Activities: Testing is a whole process, which take place in the Software Development Life Cycle (SDLC).

3) Static Testing: In this process the system is being tested and defects are founded without executing the codes. It includes reviewing of the system. It is very useful process because it is a cost effective process.

4) Dynamic Testing: In this section the quality of the system is being checked by executing the codes of the system. For example: Integration testing, System testing etc.

5) Planning: Before executing anything we have to plan about it like, controlling, testing progress, status etc.

6) Preparation: We have to choose that which technique is we have to do. So preparation of this is very essential.

7) Software products and related work products: The testing and design specification of the products are also important aspects in this domain.

II. THE TESTING SPECTRUM

In every area of software field, Testing is involved. But the method of testing is different in all area of software according to the nature and according to the objects that are used for testing.

- 1. Unit Testing** is a feature which is done at the lowest level. In this testing the basic unit of the software is tested.
- 2. Integration Testing** is performed at higher level, when two or more units are combined into a larger unit. The components and larger unit, both are being tested in this section.

3. **System Testing** is used for end-to-end quality for the system. It is based on the requirements of the system.
4. **Acceptance Testing** is used when the complete system is handed to the users, which assure the reliability of the system.

III. SOFTWARE TESTING - TYPES OF TESTING

There are different types of testing are used in the field of Software for assuring the quality of the software or the system.

Manual Testing

Manual Testing is used when the system is manually tested without using any automatic tools. In this testing the whole process depend upon the tester, who check the software manually and find any unexpected thing or error in the software.

Testers use test plans or test scenarios to test software to ensure the completeness of testing. It also includes testing in which testers explore the software to identify any errors in it.

Automation Testing

Automation Testing is also known as Test Automation. In this type of testing the tester writes scripts to test the product and find out any error in the product. It is quick method compare to the manually testing. Automation Testing increases the coverage area and improves the quality of the product and also it is less costly and less time consuming compare to the manual testing.

IV. SOFTWARE TESTING – METHODS

In the software field there are different types of methods are used for testing to check out the quality and reliability of the product. Some methods for testing are following:

Black-Box Testing

When a testing of any software is done without knowing the internal working of the application used in that software is known as the Black-Box Testing. In this testing the tester is being unaware of its internal structure and he does not access its internal codes, he interact with the system by giving input to the system and finds results as the output of the system without knowing internal working of the system.

White-Box Testing

In this method of testing the detail study of the internal structure and unit is done by coding. In this testing the tester needs to know about the whole internal working of the codes used in that software.

The whole working of the source code is to be needed by the tester to check out behavior of the system.

Grey-Box Testing

In this technique the tester doesn't need to know the complete study or complete internal working of the structure of the software.

When a tester only tests the application without knowing its internal features like in Blank-box testing, he can't prepare the better results. So like Grey-Box Testing the tester needs to know something about the application's internal features, by which he can prepare better result and can be a better in that field.

V. FUNCTIONAL TECHNIQUE AND STRUCTURAL TECHNIQUE

Functional Technique and Structural Technique determines the strategy used in the testing like the inputs used in the technique and output result of the technique.

Different quality aspects of a system are achieved by different techniques.

There are two major types of categories of testing techniques:

Functional Testing and Structural Testing.

Functional Testing: In this technique the Black-Box Testing is used to review the quality of the software. Which method of testing is being used is based on the requirement or design specification of the software.

Functional Testing indicates the external behavior of the software entity.

Structural Testing:

In this type of testing, the testing is done as the White-Box testing. The selection of test is based on the implementation of the software entity. The result of the selection of the test is used to execute the specific areas in the software field.

The expected results are decided on the set of coverage criteria like, path coverage, branch coverage, and data-flow coverage. Structural testing emphasizes on the internal structure of the software entity.

VI. SOFTWARE TESTING TOOLS

For testing the quality and reliability of the system different types of software testing tools are used to check out the software.

Quality assurance, Quality control, testing etc. are also interrelated to the each other. Following tools are used for the automation testing:

- TestComplete
- WinRunner
- Visual Studio Test Professional
- WATIR
- HP Quick Test Professional

- SilkTest
- Testing Anywhere
- LaodRunner
- IBM Rational Functional Tester
- Selenium

VII. CONCLUSION

Software Testing is an important part in the field of software or application. It provides most of the information about the quality of the product or application which is used by the many users. Software testing also provides the independent view of software in the many fields to understand the risk of software implementation. In software testing a proper process is used by execution of a program or a application to find out any error or misbehave of the software. [6]

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