

Introduction

This chapter will discuss the fundamentals of testing, such as why testing is required, its limitations, aims and purposes, as well as the guiding principles, step-by-step methods and psychological concerns that testers must take into mind. You will be able to explain the fundamentals of testing after reading this chapter.

Software testing is a method for figuring out if the real piece of software meets requirements and is error-free. It involves running software or system components manually or automatically in order to evaluate one or more intriguing characteristics. Finding faults; gaps or unfulfilled requirements in comparison to the documented specifications is the aim of software testing.

Some prefer to use the terms white box and black box testing to describe the concept of software testing. To put it simply, software testing is the process of validating an application that is being tested (AUT). In this course, software testing is explained to the audience and its importance is justified.

What is Software Testing

Software testing is the process of determining if a piece of software is accurate by taking into account all of its characteristics (reliability, scalability, portability, Re-usability and usability) and analyzing how its various components operate in order to detect any bugs, faults or flaws.

Software testing delivers assurance of the software's fitness and offers a detached viewpoint and purpose of the programmer. It entails testing each component that makes up the necessary services to see whether or not it satisfies the set criteria. Additionally, the procedure informs the customer about the software's caliber.

Testing is required because failure of the programmer at any point owing to a lack of testing, would be harmful. Software cannot be released to the end user without being tested.

What 'is Testing

Testing is a collection of methods to evaluate an application's suitability for use in accordance with a predetermined script, however testing is not able to detect every application flaw. The basic goal of testing is to find application flaws so that they may be identified and fixed. It merely shows that a product doesn't work in certain particular circumstances, not that it works correctly under all circumstances.

Testing offers comparisons between software behavior and state and mechanisms since mechanisms may identify problems in software. The method may incorporate previous iterations of the same or similar items, comparable goods, expected-purpose interfaces, pertinent standards or other criteria, but is not restricted to these.

Testing includes both the analysis and execution of the code in different settings and environments, as well as the whole code analysis. A testing team may be independent from the development team in the present software development scenario so that information obtained from testing may be utilized to improve the software development process.

The intended audience's adoption of the program, its user-friendly graphical user interface, its robust functionality load test, etc., is all factors in its success. For instance, the target 'market for banking and a video game are very different. As a result, an organization can determine if a software product it produces will be useful to its customers and other audience members.

Why Software Testing is Important?

Programmed testing is crucial because it allows any faults or mistakes in the program to be found early and fixed before the software product is delivered. Reliability, security and high performance are all ensured by well tested software, which also leads to time savings, cost efficiency and customer pleasure.

What is the Need of Testing?

Software flaws may be costly or even harmful, thus testing instances when software defects led to financial and personal loss is crucial. History is replete with

- Over 300,000 traders in the financial markets were impacted after a software error caused the London Bloomberg terminal to collapse in April 2015. It made the government delay a 3-billion-pound debt auction.
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- Nissan recalled nearly 1 million: vehicles from the market because the airbag sensory detectors' software was flawed. Due to this software flaw, two accidents have been documented.
- Starbucks' POS system malfunctioned, forcing them to shut nearly 60 % of its locations in the United States and Canada. The shop once provided free coffee since they couldn't complete the purchase. -
- Due to a technical error, some of Amazon's third-party sellers had their product prices slashed to 1p. They suffered severe losses as a result.
- A weakness in windows 10. Due to a defect in the win32k system, users are able to bypass security sandboxes thanks to this issue.
- In 2015, a software flaw rendered the F-35 fighter jet incapable of accurately detecting "targets. On April 26, 1994; an airbus A300 operated by China airlines crashed due to a software error, killing 264 unintentional people.
- Three patients died and three others were badly injured in 1985 when a software glitch caused Canada's Therac-25 radiation treatment system to fail and deliver deadly radiation doses to patients.
- In May 1996, a software error led to the crediting of 920 million US dollars to the bank accounts of 823 clients of a large U.S. bank.
- In April 1999, a software error resulted in the failure of a \$1.2 billion military satellite launch, making it the most expensive, accident in history.

What are the Benefits of Software Testing?

The following are advantages of employing software testing:

One of the key benefits of software testing is that it is cost-effective. Timely testing of any IT project enables you to make long-term financial savings. If flaws are found sooner in the software testing process, fixing them is less expensive.

Security: This perilous and delicate advantage of software testing. People are searching for reliable goods. It assists in eradicating hazards and issues early.

Product quality: Any software product must meet these criteria. Testing guarantees that buyers get a high-quality product.

Customer satisfaction: Providing consumers with contentment is the primary goal of every product. The optimum user experience is made guaranteed of through U/UX testing.

Type of Software Testing

1. Manual testing:

« The process of checking the functionality of an application as per the customer needs without taking any help of automation tools is known as manual testing. While performing the manual testing on any application, we do not need any specific knowledge of any testing tool, rather than have a proper understanding of the product so we can easily prepare the test document.

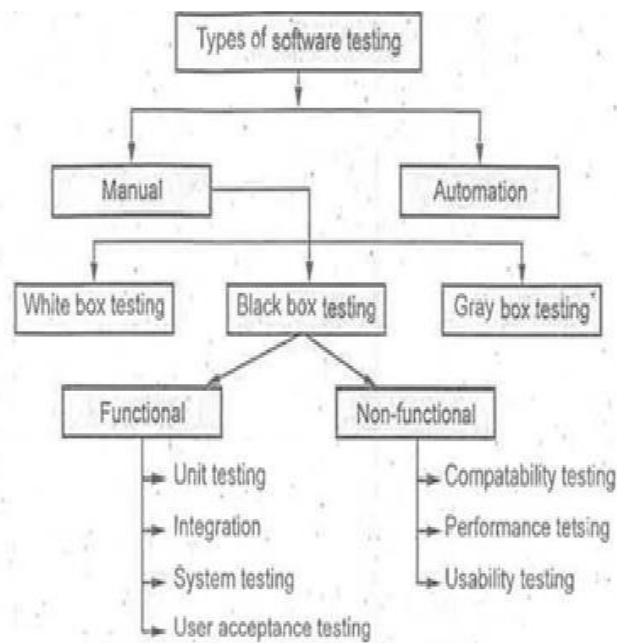


Fig. 1.1.1 Type of software testing

Manual testing can be further divided into three types of testing, which are as follows:

- White box testing
- Black box testing
- Gray box testing.

2. Automation testing:

Automation testing is a process of converting any manual test cases into

the test scripts with the help of automation tools or any programming language is known as automation testing. 'With the help of automation testing, we can enhance the speed of our test execution because here, we do not require any human efforts. We need to write a test script and execute those scripts.