Assignment 3 : Manual Testing and it’s types

Manual Testing :

Manual testing is a software testing process in which test cases are executed manually without using any automated tool.

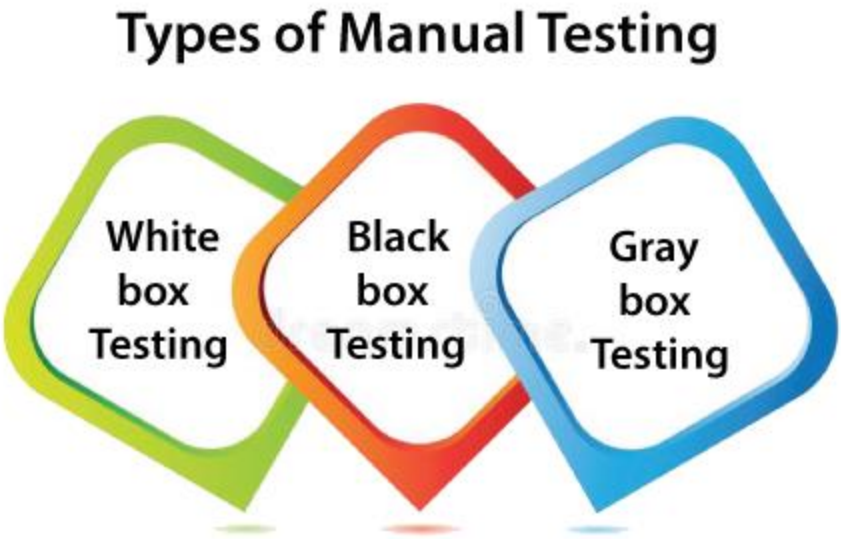
Test cases are planned and implemented to complete almost 100 percent of the software application.

Test case reports are also generated manually.

Why we need manual testing?

Whenever an application comes into the market, and it is unstable or having a bug or issues or creating a problem while end-users are using it.

If we don't want to face these kinds of problems, we need to perform one round of testing to make the application bug free and stable and deliver a quality product to the client, because if the application is bug free, the end-user will use the application more conveniently.



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1. **White Box Testing :**
    - The white box testing is done by Developer, where they check every line of a code before giving it to the Test Engineer.
    - Since the code is visible for the Developer during the testing, that's why it is also known as White box testing.

The white box testing contains various tests, which are as follows:

- Path testing : In the path testing, we will write the flow graphs and test all independent paths.
- Loop testing : In the loop testing, we will test the loops such as while, for, and do-while, etc. and also check for ending condition if working correctly and if the size of the conditions is enough.
- Condition testing : In this, we'll test all logical conditions for both true and false values.
- Testing based on the memory perspective.
- Test performance of the program.
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Reasons for white box testing

- It identifies internal security holes.
- To check the way of input inside the code.
- Check the functionality of conditional loops.
- To test function, object, and statement at an individual level.

Advantages of White box testing

- White box testing optimizes code so hidden errors can be identified.
- Test cases of white box testing can be easily automated.
- This testing is more thorough than other testing approaches as it covers all code paths.
- It can be started in the SDLC phase even without GUI.

Disadvantages of White box testing

- White box testing is too much time consuming when it comes to large-scale programming applications.
- White box testing is much expensive and complex.
- It can lead to production error because it is not detailed by the developers.
- White box testing needs professional programmers who have a detailed knowledge and understanding of programming language and implementation.

2. Black Box Testing :

- The black box testing is done by the Test Engineer, where they can check the functionality of an application or the software according to the customer /client's needs.
- In this, the code is not visible while performing the testing; that's why it is known as black-box testing.

Generic steps of black box testing

- The black box test is based on the specification of requirements, so it is examined in the beginning.
- In the second step, the tester creates a positive test scenario and an adverse test scenario by selecting valid and invalid input values to check that the software is processing them correctly or incorrectly.
- In the third step, the tester develops various test cases such as decision table, all pairs test, equivalent division, error estimation, cause-effect graph, etc.
- The fourth phase includes the execution of all test cases.
- In the fifth step, the tester compares the expected output against the actual output.
- In the sixth and final step, if there is any flaw in the software, then it is cured and tested again.

Advantages of black box testing

- **Simplicity:** Facilitates testing of high-level designs and complex applications.
- **Conserves resources:** Testers focus on software functionality.
- **Test cases:** Focusing on software functionality to facilitate quick test case development.
- **Provides flexibility:** Specific programming knowledge is not required.

3. Grey Box Testing :

- Gray box testing is a combination of white box and Black box testing.
- It can be performed by a person who knew both coding and testing.
- And if the single person performs white box, as well as black-box testing for the application, is known as Gray box testing.

Generic Steps to perform Grey box Testing are:

1. First, select and identify inputs from BlackBox and WhiteBox testing inputs.
2. Second, Identify expected outputs from these selected inputs.
3. Third, identify all the major paths to traverse through during the testing period.
4. The fourth task is to identify sub-functions which are the part of main functions to perform deep level testing.
5. The fifth task is to identify inputs for subfunctions.
6. The sixth task is to identify expected outputs for subfunctions.
7. The seventh task includes executing a test case for Subfunctions.
8. The eighth task includes verification of the correctness of result.

Advantages of Grey box testing

- It provides combined benefits of both Blackbox testing and WhiteBox testing.
- It includes the input values of both developers and testers at the same time to improve the overall quality of the product.
- It reduces time consumption of long process of functional and non-functional testing.
- It gives sufficient time to the developer to fix the product defects.
- It includes user point of view rather than designer or tester point of view.
- It involves examination of requirements and determination of specifications by user point of view deeply.