

Date
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Unit-5

Software Quality & Testing:-

Software Quality:-

There is no one universal definition of the software quality because of the complexity, by the project in such a way quality of the software, customer development and stakeholders of the project. The customer may be satisfied through the software quality, and other functions. The software quality is based on such

as

1. customer focus and customer satisfaction,
2. Functional and Performance requirement.
3. Easy to Learn and Maintainability.
4. Authorized to development of the project.

customer satisfaction largely depends on the functional performance and requirements of the project. Software quality is defined as the quality of ensure customer satisfaction, by offering all the customer development of the project.

Build a Quality in the Software:-

Developing methods that can produce high quality software engineering. We can give view the quality of software project having three dimensions :-
1. product operation.
2. product transaction.
3. product review.

1. Product operation:-

In the quality of the software product

operations are

1. correctness
2. reliable.

1. correctness :-

Correctness is the program satisfy or satisfaction of the project.

2. Reliable :-

Reliability is the property that defines how well the software requirements to develop the project. or to develop the software.

3. Efficiency and usability.

2. Product Transaction:-

In the software quality has two types of product transaction.

1. portability.

2 Reusability.

1. Portability:-

Portability is the effort require to transfer the software from one configuration to another configuration. (or) transferring from one operating system to another operating system.

2. Reusability:-

Reusability is the extension of the software can be reused in another software application.

3. product Review:-

In the Software quality there are 3 types of product review or product revision.

1. maintainability
2. Testability.
3. Flexibility

1. Maintainability:-

Maintainability is the effort required to maintain the system in order to check the quality of system software.

2. Testability:-

Testability is the effort required to test the software system or module of the project.

3. Flexibility:-

Flexibility is the effort required to modify an operational program of the given project.

Testing:- Software testing is the process of identifying the correctness and quality of the software program. The purpose of testing is to check whether the software satisfies the specific requirement, development of the customer. Testing is executing a system or application in order to find the software bugs, defects or errors. The main role of the testing is to find out the resources applications.

* Software quality Assurance:-

Software quality assurance is a planned to ensure the software products to add the project that is portability, efficiency, reliability, and flexibility. It is the collection of activities and functional usage to monitor and control the software project. so that the specification

of the object can be developed in the project. Software quality assurance is the responsibility of the software. The software quality consists of project manager, project leader and the users.

The software engineering recommends a set of activities for implementation such as

1. Quality assurance planning.
2. Data gathering.
3. Data Analysis and Reporting.
4. Quality control missions.

The first requirements in software quality assurance is that a group of responsibilities for quality and organisation. The role of SQA group is to design the software. "Every software has certain quality goals specified by the customer. These quality goals are to be achieved by the development team designed for a Big projects.

SQA activities for a quality management. These activities play the important role like monitoring, tracking, evaluation and it will give the reviews to the quality organisation.

The Responsibilities of delivering the require quality to the customer to reset the development team. The development team as an to implement a quality policy for the new projects test plan can be developed

Software Quality Assurance plan :-

The software quality Assurance plan is an ensure the quality of the software levels to develop the project. This plan is used for the development team

and quality of the software.

The plan provides the framework and guidelines for the development of understandable and maintainable code. The quality of the software project has to be plan before development of the project.

Quality Matrices :-

Software matrices is a standard maintenance of the project for the development of measurements. It can be classified into three categories.

1. Product matrices.
2. process matrices.
3. project matrices

1. Product Matrices :-

Product matrices describes the characteristics of the product such as size, complexity, decision factors, performance and quality level.

2. Process matrices :-

Process matrices can be used to improve software development and maintenance.

Ex:- the efficiency of the software and removing the defects and development of the software.

3. Project matrices :-

Project matrices describes the project characteristics and execution. For example the no. of software developments that satisfies the software life cycle, cost of the software, scheduling time and productivity.

Software reliability :-

Once a software system is functioning as a software development, the reliability of a characteristics defines the capability of the system and to maintain the software. For example if the network is down for the 20 seconds then come back the system schedule will be regenerating the functions of previous software system. The Software systems reliability is the property that defines how well the software required proper specifications to the related systems.

Software Testing :-

Software testing is the process of identifying the correctness and quality of the software programs. The purpose of Software testing satisfy the specific requirement of the system. Testing is executing the system or application in order to find the bugs, defects (or) errors. The job of the testing is to find the resources of the application and correct the coding and requirements of the software.

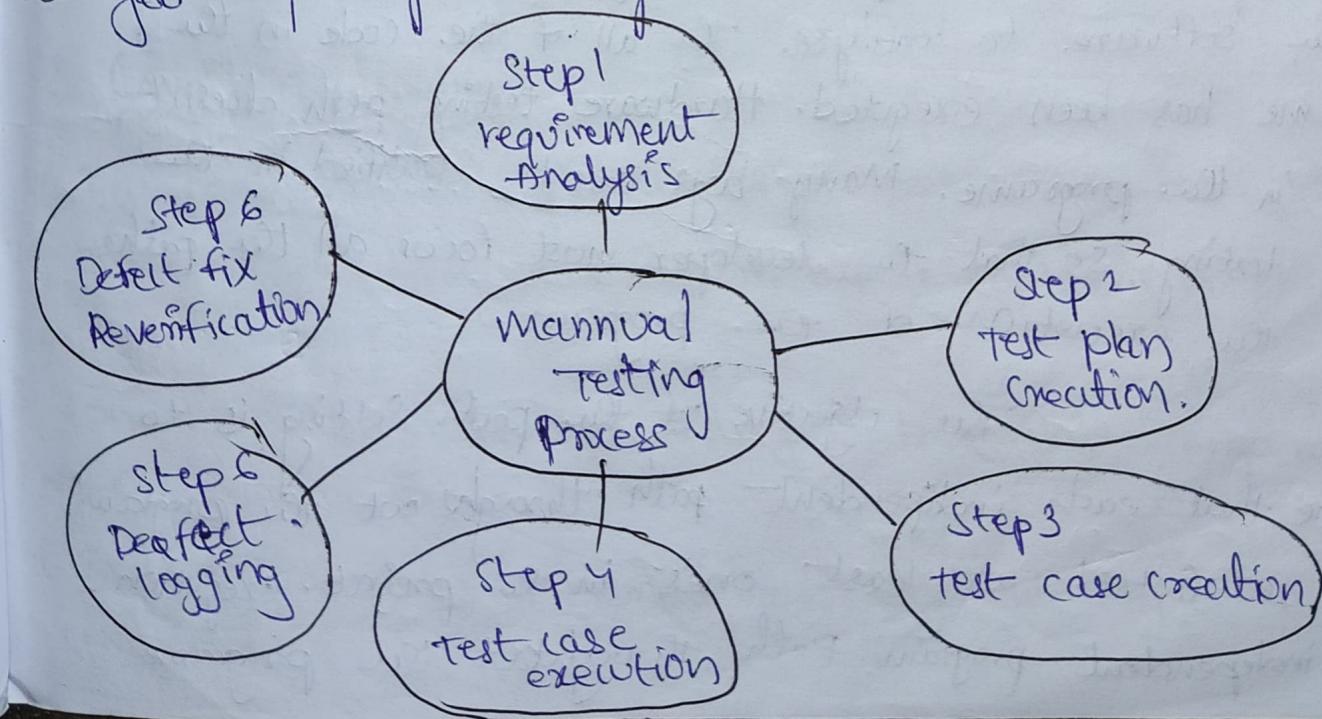
Software testing can be the main reason to develop the software and give the advantages to the software developer and make sure that the developer should identify the mistakes on the project and he have to regenerate testing code and give the results. There are many ways of software testing.

1. Manual Testing :- Test case executed manually.
2. Automation testing :- Testing performed with the help of automation tools.

Manual Testing :-

Manual testing is a process of finding out the defects (or) bugs in a software programme. In this method the tester team plays an important role of end users and verifies the features of the application in the project.

The test manual execute the system by the user it will take more longer time in manual testing of a software. The defects are fixed by the developer of software application. The main goal of the manual testing is to ensure the application is identified by the errors and defects it provides the good quality working condition to the customers.



Products of manual testing :-

- Requirement Analysis.
- Test plan creation
- Test case creation
- Test case execution.
- Defect logging
- Defect fix Reverification.

Path Testing :-

Path testing is an approach to test the every path of the programme has been executed atleast once.

Normally we use a dynamic analysis tools and characteristics of the software to analyse the all of the code in the programme has been executed. Hardware testing path doesn't exist in the programme. Many bugs can be identified in the path testing so that the developer must focus all the paths for the execution of the program.

The objective of the path setting is to ensure that each independent path throughout the program is executed at least once in the project execution. An independent program path throughout the programme

is executed, and traverses at least ones, in the path testing. Both the true and false branches of all the conditions must be exercised line by line or function by function so that the developer can identify the errors in the project.

Benefits of Path Testing :-

1. It helps to reduce the identifying the errors.
2. It focuses attention on the programming logic.
3. Path testing helps the test facilities analytical a structural Diagram.
4. Test case is executes every statement in the program at least ~~one~~ once.

Control structures Testing:- (white box testing)

Control structure Testing is a group of (white Box testing) methods and classified into 3 types.

1. Condition Testing
2. Data flow Testing
3. Looping Testing.

1. Condition Testing:-

1. In condition testing case design methods can be used
2. In condition testing working on logical conditions in programme methods.
3. Condition testing involves testing of both relation experience of the team members
4. In condition testing increment and decrement loops can be completed.

5. Boolean experience. It is an condition without relation of other conditions.

2. Data Flow Testing :-

1. Data flow testing method is effective error prediction because it is based on relationship between statement in the programme according to the definition of the data flow structure.
2. Test path are selected according to the location of user variables in the programme.
3. The data flow testing will be used when large systems, however it can be used in the software supporting system.

3. Looping Testing :-

1. Loop testing method on the looping structure.
2. Loop testing are fundamental to many algorithms for condition of the programme.
3. Loops can be defined as a simple and necessary and understandable.
4. In simple loops test case can be applied or skip the looping statement like $n, (n-1), (n+1), \dots$ this is incremental looping max no. of statements.
5. In understand loops, unstructured loops can be written in the classes, Functions and methods.

4. Black Box Testing :-

In Black Box testing method testing is done without

knowing the internal codes and structure of the program, the testing is done from customer's point of view and the tester knows only about the inputs and the expected outputs of the application. Tester is not aware how the requests are being processed by the software and giving the output results.

Example:-

In case of google or any other search engine, the user enters text in the browser. The search engine locates and retrieves the data results. The user is not aware of the source of process. A black box software tester selects of valid and invalid input and checks for valid output response.

It is called "Black Box" because software is like a black box inside which tester can not see. The main purpose of black box testing is to check whether software is working as expected and meeting the customer requirements or not. It was designed as a method of analyzing client requirements, specifications and high level design strategies.

System Testing involves testing the software code for following:

- Testing the fully integrated applications including external peripherals in order to check how components interact with one another and with the system as a whole. This is also called end to end testing scenario.
- Verify through testing of every input in the application to check for desired outputs.
- Testing of the user's experience with the application.

That is a very basic description of what is involved in system testing. You need to build detailed test cases and test suits that test each aspect of

the application as seen from the outside without looking at the actual source code. It has been said that writing integration, validation and system testing is more difficult than writing unit tests.

Integration Testing:-

When the various modules are integrated, this testing is performed to detect errors from overall the system.

Validation is the process of evaluating software during or at the end of the development process to determine whether it satisfies specified requirements.

Validation is the process of evaluating the final product to check whether the software meets the customer's expectations and requirements. It is a dynamic mechanism of validation and testing the actual product.

Methods of validation:-

Dynamic Testing

1. Testing

2. End Users

Difference between Verification and Validation

The distinction between the two terms is largely to do with the role of specifications.

Validation is the process of checking whether the specification captures the customer's needs.

Did I build what I said I would?

Verification is a process of checking whether the software meets the specification.

Difference between Verification & Validation

Verification

1. Verification is a static practice of verifying document, design, code and program.
2. It doesn't involve executing the code.
3. It is human based checking of documents and files.
4. Verification uses methods like inspections, reviews, walkthroughs, and test-checking etc ...
5. Verification is to check whether the software conforms to specifications.
6. It can catch errors that validation cannot catch. It is low level exercise.
7. Target is requirements specific "ation", application and software architecture, high level, complete design, and database design etc..

Validation

1. Validation is a dynamic mechanism of validating and testing the actual product.
2. It always involves executing the code.
3. It is computer based execution of program.
4. validation uses methods like black box (functional) testing, gray box testing, and white box (structural) testing etc ..
5. validation is to check whether software meets the customer expectations and requirements.
6. It can catch errors that verification can not. It is high level exercise.
7. target is actual product a unit, a module, a bent of integrated modules and effective final product.

8. Verification is done by QA team to ensure that the software is as per the specification in the SRS document.

9. It generally comes first - done before validation.

8. Validation is carried out with the involvement of testing team.

9. It generally follows after verification.

both stages in the process do not

exist between two modules - A project (Institute) and Project X, where both projects have separate project managers.

different phases of a module - 2 denotes test team members, 3 denotes other two modules

test cases (not) not fit. A part of the module.

Testing levels of report + testing description in report to find a bug is fine so two bugs belong to the same unit which

exists between two modules, applications, testing, maintenance etc. projects - these are

part of validation. Testing involves creation of test cases, execution of test cases, analysis of results, reporting of findings.

test cases (not) not fit. A part of the module. Bugs in module

testing description in report to find a bug is fine so two bugs belong to the same unit which