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**Testing**- It is done to check whether the developed software is bug free and suitable to the requirements or not.

Testing is divided into two steps-Verification and validation.

**Verification**: Verifying that the product which are building is right or not!

**Validation**: Verifying that the right product is been built or not!

The main objective of the testing is to release a quality product to the customer.

Quality product is nothing but a bug free application to the client. This Bugs or errors can be rectified and modified by testing only.

Why testing is important?

Let us take a example a banking application is built and without testing released to production, due to some errors in code clients cant do a transaction online or not showing available balance. This is called errors in application to overcome this testing is done before sent to production.

**Error**: When developer fails to understand the logic or requirement of client. A mistake made in the code .That might be a syntax error, logical error, runtime error, etc..

**Bug:** System failed to perform the required tasks is called as a bug.

**Failure**: If there is a multiple defects that lead to a software failure.

Bugs occur due to lack of communication, specification, code, design.

Software testing is majorly of two types:

1- Manual testing

2-Automation testing.

**Manual Testing**-Here do not use any testing tools, test cases are prepared by humans and test the software manually. This testing works well for Functionalities, user Interface, website behaviour, user acceptance.

**Automation Testing**- Here we use pre-scripted tools to test the software. It finds more bugs compared manual testing, it allows of reuse of tests.

**Software Testing:** It is a part of SDLC(software development lifecycle)

It is done to detect and identify the defects present in the developed software. To check whether it is satisfying the end user needs or not.

**Project:** If a software is build for specific customers it is called project.

**Product:** If a software is build for multiple users it is called product.

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**Advantages of manual testing:**

*Flexibility and Adaptability:* If any changes are made then that changes can be easily adaptable by humans Testers.

*Cost effectiveness:* As we are not using any test tools or machines to test the code.

*Immediate feedback:*  Here we humans test the code they identify the mistakes in the development itself.

*User Interference:* Tester usually interacting with software application user interface to check the issues with functionality, visual appearance.

**Disadvantages of manual testing:**

*Human Error:* Human error can happen by making mistakes while by executing the code.

*Expensive:* It will be expensive when end user requirements are changed or required frequent releases.

*Time consuming:* Test cases need to be executed manually so it takes more time compared to automation.

Techniques of Testing:

* Static Testing
* Dynamic Testing

**Static Testing:** This testing is used to check defects in the software without actually executing the code. Here programmer checks every line of code and handover to the tester. This type of testing uses both manual and automation testing. It is done while running the test process.

**Dynamic Testing:** It confirms that the software product works according to the clients requirements or not. This dynamic testing is broadly divided into two groups white box testing and black box testing.

***Black Box Testing:*** Checks functionality of the product. Looks only at whether the product functions as expected. It is a high level testing.

***White Box Testing:*** Focus on internal structure of the code. Developers check each line of code.

Levels of testing:

***Unit Testing:*** Individual modules of code is their. This modules of code is tested by QA engineers.

***Integration Testing:*** Individual modules are grouped together and tested while they are working properly or not.

***System Testing:*** Checking entire software system by verifying the app with software requirements listed in specifications.

***Acceptance Testing:*** Testing the software in real- world from users end and getting the feedback from the customer. This alpha testing is of two types:

* Alpha Testing: Software is tested by internal development team in the presence of customer.
* Beta Testing: Testing is done by customers to check whether software is working properly or not.

***Smoke Testing:*** Testing done only on the newly released software application.