

## Testing

03-02-2025

V.suneetha

### 1. What is Testing

1.1 Testing is the process of checking if something works properly or correctly.

1.2 Testing means running a program to find and fix mistakes(bugs)before it is used by people(clients, end users). It ensures that software functions as expected and is free from errors.

For example, before launching a mobile app, testers check if buttons work, pages load properly, and no crashes happen.

1.3 The process of identifying the bugs/errors/defects

1.4 the process of checking whether the project/product is satisfying the requirements of the client(end user) or not

### 2. Objectives of testing

2.1 Detects bugs & errors - identify and fix defects before release.

2.2 Ensure Software Quality - Validate performance, usability, security and reliability.

2.3verify functionality - check if the software works as intended

2.4 Improve User Experience - Ensure a smooth and error-free user experience.

2.5 Ensure Compliance - meet industry standards and regulations

2.6 prevent costly failures - reduce the risk of major issues after deployment

2.7 validate Performance - Test speed and scalability

2.8 validate requirements - Verify alignment with stakeholder expectations

2.9 Ensure Security - Authentication and Authorization, Data Encryption, Session management

2.1.1 Enhance Usability- check accessibility, assess responsiveness, user interface evaluation

2.1.2 Ensure Compatibility- operating system testing, Network Environment Testing, cross-browser testing.

2.1.3 Meet Compliance and standards - data Privacy and security testing, accessibility Compliance

## Testing

2.1.4 Provide Reliable Documentation - document Test Plans, create test cases, track test results, bug/defect reporting, generate test summary reports

2.1.5 Ensure Security - Identify vulnerabilities and protect user data

- Ensuring the quality of product/project(Functionality, Usability, Performance, Reliability, Security, compatibility, maintainability, scalability, testability, finally customer satisfaction)
- Ensuring the Correctness(Requirement verification, Expected Outputs, Accuracy)
- Ensuring the robustness(fault tolerance, input management,error handling - it refers to the software ability to handle unexpected situations)
- Ensuring the reliability(Consistency, Availability, error free operation, durability, recoverability)
- Ensuring the product is bugfree before shipment or release(User Satisfaction, Reputation, cost reduction, performance, security)

## 3. Why Testing

- To Ensure The developed software/project/product is a very good quality
- To ensure that bugfree
- Verify requirements
- Ensure security
- Improve user experience
- Ensure compatibility
- Save costs in the long run
- Provide confidence to stakeholders
- Improve maintenance and future development

## 4.What is Software Testing

- Testing of entire application(entire code)
- It is the process of evaluating and verifying that a s/w application meets the specified requirements and works as expected.
- The goal of s/ testing is to identify bugs, errors and defects in the s/w to ensure it is reliable, functional, secure and free of issues that could affect its performance or the user experience

Testing

5.What Is Quality

- It is defined as justification of all the requirements of a customer in an application
- Quality Software(functionality, reliability, usability, efficiency, maintainability, security, compatibility)
- Bug free software(thorough testing(unit, integration, system, regression), code reviews, static code analysis, error handling and debugging)
- Satisfying the requirements of clients(understand client needs, documents requirements clearly, set realistic expectation, frequent communication, deliver on time)
- Delivering the project/product/software application on time(proper planning, allocate resources effectively, monitor progress regularly)
- Reduce maintenance cost(invest in quality at the start, automate maintenance tasks, train staff properly, optimize spare parts management, use remote monitoring and support)
- If we develop and deliver software within the budget

6. What is the need of Software testing

- In Order to deliver quality software/application/project/product(understand customer needs, test thoroughly, improve continuously, ensure reliability, be efficient)
- To satisfy the requirements of the user(understand user needs, set clear requirements, design with the user in mind, ensure functionality, test with real users, deliver quality, continuous improvement)
- To make the developed software more reliable(code quality, error handling, automated testing,monitoring and logging)
- In order to avoid the negative feedback from the clients(understand client expectations, deliver high quality work, regular communication, meet deadlines ensure ease of use, exceed expectations, be transparent, ensure consistency)

7. What is project and product

project	product
Definition -	Definition

## Documentation of Today's class

### Testing

If the software is developed based on the requirement of specific customer then it is called as project	If the software is developed based on the requirement of multiple customers in the market then it is called as product
<b>Duration -</b>  A project has a defined start and end time	<b>Duration -</b>  A product is ongoing and has a lifecycle that can continue for years or until its retired
<b>Goal -</b>  The goal of a project is to complete specific tasks within a defined time frame	<b>Goal -</b>  The goal of a product is to satisfy customer needs and provide value continuously
<b>Focus -</b>  A project focuses on delivering a specific output or result	<b>Focus -</b>  A product focuses on meeting user needs and improving over time through updates

### 8. What is an Error, Bugs/defects, Failure

error	bugs/defects	failure
1.Incorrect human action that produces a false output	Deviation from the expected behaviour to actual behaviour of the system	It is defined as the complete deviation from the actual behaviour of the system
2.A mistake made by a developer during coding	A defect in the s/w that causes incorrect behaviour	The occurrence when the s/w fails to meet the required functionality in the real world production environment

## Documentation of Today's class

### Testing

3. During development, while writing code.	3. during testing or post development. Found when the s/w	During runtime or production when users interact with the software
A typo in a variable name or Using the wrong operator (e.g = instead of ==)	A button on the user interface doesn't perform the expected action when clicked	A user can't process a payment in an app due to an issue, leading to a failure on functionality

### 9. Why the software has bugs normally

- Miscommunication or human error (developers are human, and mistakes happen. Bugs can arise from typing errors, misinterpretation of requirements while writing the code)
- Software complexity (software systems can be very complex, with many interconnected parts, even a small change in one area of the code can affect another area, leading to bugs, lengthy code)
- Changing requirements (if the req for the s/w are unclear, developers might implement features incorrectly, leading to bugs. Incomplete specifications can result in functionality that doesn't align with the user's expectations).
- Lack of programming skills
- Lack of skills testers
- Lack of collaboration (between developers, testers and other team members can lead to misunderstanding and missed req, resulting bugs in the final product)
- Changes in code (when developers modify or update existing code, they can introduce new bugs)
- Third-party dependencies (many software applications rely on external libraries, API's, or services. If these dependencies are updates or change unexpectedly, it can introduce bugs into the software)

## Documentation of Today's class

### Testing

- Time and Pressure( developers might be under tight deadlines, leading to rushes coding, incomplete testing, or skipping some critical steps in the development process, it leads more bugs)
- Versioning Issues(different versions of the s/w can cause bugs)

## 10. Software development life cycle(SDLC)

### 1. Requirement gathering and Analysis/planning -

This is the first step where the project goals are defined.it includes understanding the requirements and creating a project plan

### 2. Design-

After planning, the design phase begins. Developers create a blueprint or design for how the software will work.

### 3. development-

This is where the actual coding happens. Developers write the code to create the software based on the design specifications

### 4. Testing - once the software is developed, its tested to find and fix any bugs or issues. This step ensures the software works as expected and meets user requirements

### 5. Deployment - after testing, the software is released to the users. It is deployed on the production environment where it becomes accessible to the end- users

### 6. Maintenance - once the software is in use, it requires ongoing maintenance, this involves fixing bugs, updating the software, and adding new features as

## Documentation of Today's class

### Testing

needed.