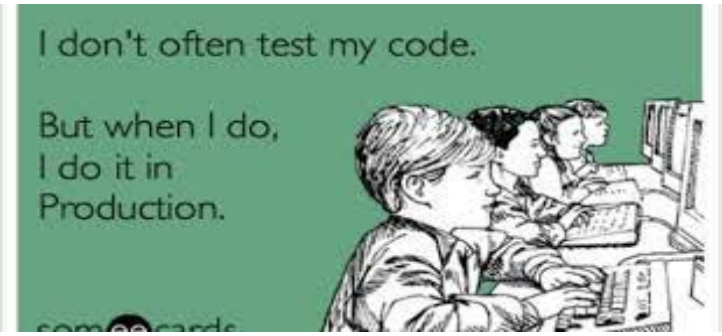
Software Testing and SDLC



October 2022
Version 1.0

Contents

What is Software Testing?

Software testing is the process of evaluating and verifying that a software product or application does what it is supposed to do. The benefits of testing include preventing bugs, reducing development costs and improving performance. What is the importance of Software testing?

What is the importance of software testing?

Software testing is imperative, as it identifies any issues and defects with the written code so they can be fixed before the software product is delivered. Improves product quality. When it comes to customer appeal, delivering a quality product is an important metric to consider.

Why is software testing necessary?

Human errors can cause a defect or failure at any stage of the software development life cycle. The results are classified as trivial or catastrophic, depending on the consequences of the error.

The requirement of rigorous testing and their associated documentation during the software development life cycle arises because of the below reasons:

To identify defects

To reduce flaws in the component or system

Increase the overall quality of the system

There can also be a requirement to perform software testing to comply with legal requirements or industry-specific standards. These standards and rules can specify what kind of techniques should we use for product development. For example, the motor, avionics, medical, and pharmaceutical industries, etc., all have standards covering the testing of the product.

Source: https://www.techtarget.com/whatis/definition/software-testing

1.0 Types of software testing

1.1 Unit testing

A unit test is a way of testing a unit - the smallest piece of code that can be logically isolated in a system. In most programming languages, that is a function, a subroutine, a method or property. Modern versions of unit testing can be found in frameworks like JUnit, or testing tools like TestComplete.

More info: https://www.guru99.com/unit-testing-guide.html

1.2 Functional testing

Checking functions by emulating business scenarios, based on functional requirements. Black-box testing is a common way to verify functions. This testing should be done by developers during the development phase. This is testing the specific function/feature being created, updated or removed to make sure the change is effective.
More info: https://www.guru99.com/functional-testing.html

1.3 Integration Testing

In Software testing, it is important that every system component gets integrated with the different application modules to ensure smooth working of the entire system. Enterprises following agile and DevOps should take up integration testing to ensure that the application modules function effectively when they are grouped together.

Thus, Integration testing should be leveraged by businesses as there are numerous benefits with it such as the process helps to identify system-level issues such as module integration issues, broken databases, etc. and helps to identify them while developers resolve them at the earliest. Explore the benefits businesses get with Integration Testing.

1.4 Regression Testing

Regression testing is one of the software testing types that should be performed when there is a change made in the application or when there is a new feature added to the application. With this testing practice, tests are conducted to ensure and check the previously developed and tested software still performs well even after a change is made in the software.
This is an effective functional testing type that should be taken up especially when there are continuous changes made in the application as this testing process checks for any new

bug or error in the existing software and is more so a verification process for the software. Read when regression testing should be taken up.

1.5 Automation Testing (Selenium, Cucumber)

With today's enterprises adopting agile and DevOps processes, it becomes a mandate for these practices to leverage automation testing. Basically, Test automation is critical for continuous delivery (CD) and continuous testing (CT), as it can speed up the release cycles, increase test coverage and ensure quality software release.

Software automation testing involves the usage of tools and test scripts to test the software, and these automated test results are more reliable. Hence, test automation speeds up the testing process, ensures faster releases and delivers accurate results. Read the significance of automation testing for enterprises.

1.6 Performance Testing (LoadRunner, JMeter, Blazemeter, Oracle Real Application Testing - RAT)

Today's businesses become successful only if their business-critical mobile and web applications perform well under varying loads and should essentially deliver great performance. If these business apps crash when numerous users tend to use it, then users will dump such apps and would never wish to get back to such apps.

Only those mobile and web apps that perform seamlessly under varying loads are bound to deliver a great customer experience (CX). In order to get high-performing digital mobile and web apps, leverage performance testing from next-gen testing service providers.

Introduction to Oracle Real Application Testing:

https://docs.oracle.com/cd/E11882_01/server.112/e41481/rat_intro.htm#RATUG101

1.7 UAT (User Acceptance Testing)/ PVT (Production Validation Testing)

As soon as a product is developed, even before it is moved to production, the product owner will check its functionality and usability by performing the User acceptance testing. This is actually the final phase before launch where the stakeholders check if the product is as per their requirements and also check if there are any errors while moving ahead with the functionalities. Primarily, a UAT is an important and final phase to test whether the software is functioning as per the requirements.

PVT - A heavily controlled test done after the code has been moved to Production. This is to verify that the application overall is functioning as expected – not to necessarily test the new change unless there is a safe way to do this. It is heavily controlled/planned because in many cases, the test deals with real data (a real user's info, a real credit card, real money movement, etc).

1.8 User Testing (Beta Testing)

One of the important types of software testing that is gaining more popularity in recent years is user testing. This form of user testing refers to a technique wherein real users take up the role of testers to test the interface and functions of applications, websites, mobile applications, or services.

In this method, the real users test the apps by considering various real-time use cases and the feedback from these users helps in improving the application for the end-users. This is a usability technique to gain valuable insights from users regarding how they feel about the product. Read significance of user testing for businesses.

1.9 Penetration Testing “Pen test”

A company’s security stance is continuously changing in-line with the growing risks. A traditional penetration testing service is a point in time evaluation.

However, **PTaaS involves a continuous cycle of testing and remediation**. It suggests that to combat the changing security stance of the company, there must be an on-going program of testing and management.

The PTaaS methodology **recognizes, tests and validates the entire platform stack**.

Read this to know more on how PTaaS protects the software ecosystem..

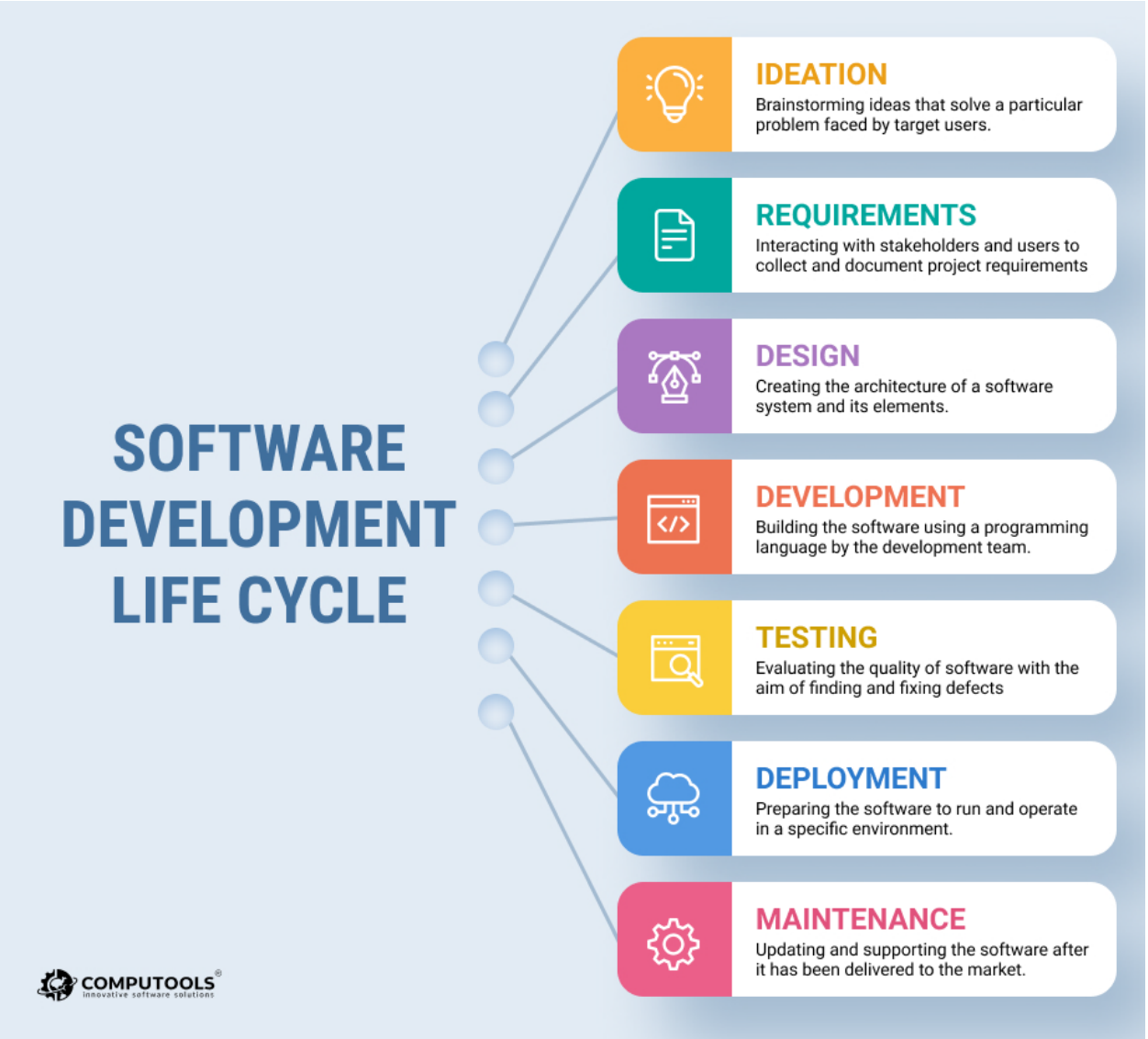
1.10 Accessibility Testing

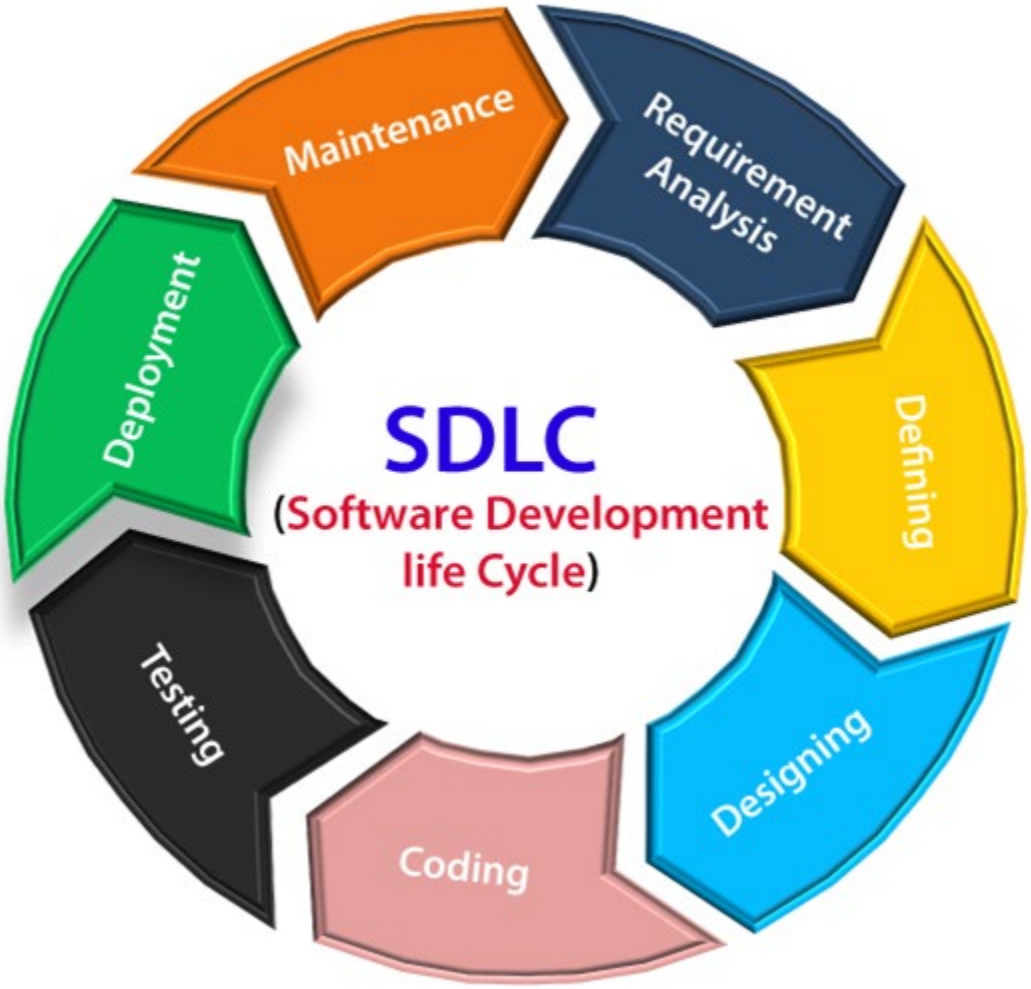
In today’s digital age with connected devices and mobile apps running in millions, there is a need for these mobile & web apps to be accessible to differently-abled people. However, there are various innovative products, applications and websites that are not made accessible to people with certain disabilities.

But, today, it is a mandate that businesses should leverage accessibility testing. This sort of software testing not only focuses on verifying app usability, but it also makes sure that the application can be used by people with many disabilities, including visual, auditory, physical, speech, cognitive, language, learning, and neurological disabilities. Read why accessibility testing is important for your business.

DEVICE COMPATIBILITY (mobile, browsers, etc) as well as ACCEPTANCE AND ADA-type testing (Colors, fonts, text to describe pics)

2.0 Testing in Software Development Life Cycle




Maintenance
Requirement Analysis
Deployment
Defining
SDLC
(Software Development life Cycle)
Testing
Designing
Coding