What is Non-Functional Testing?

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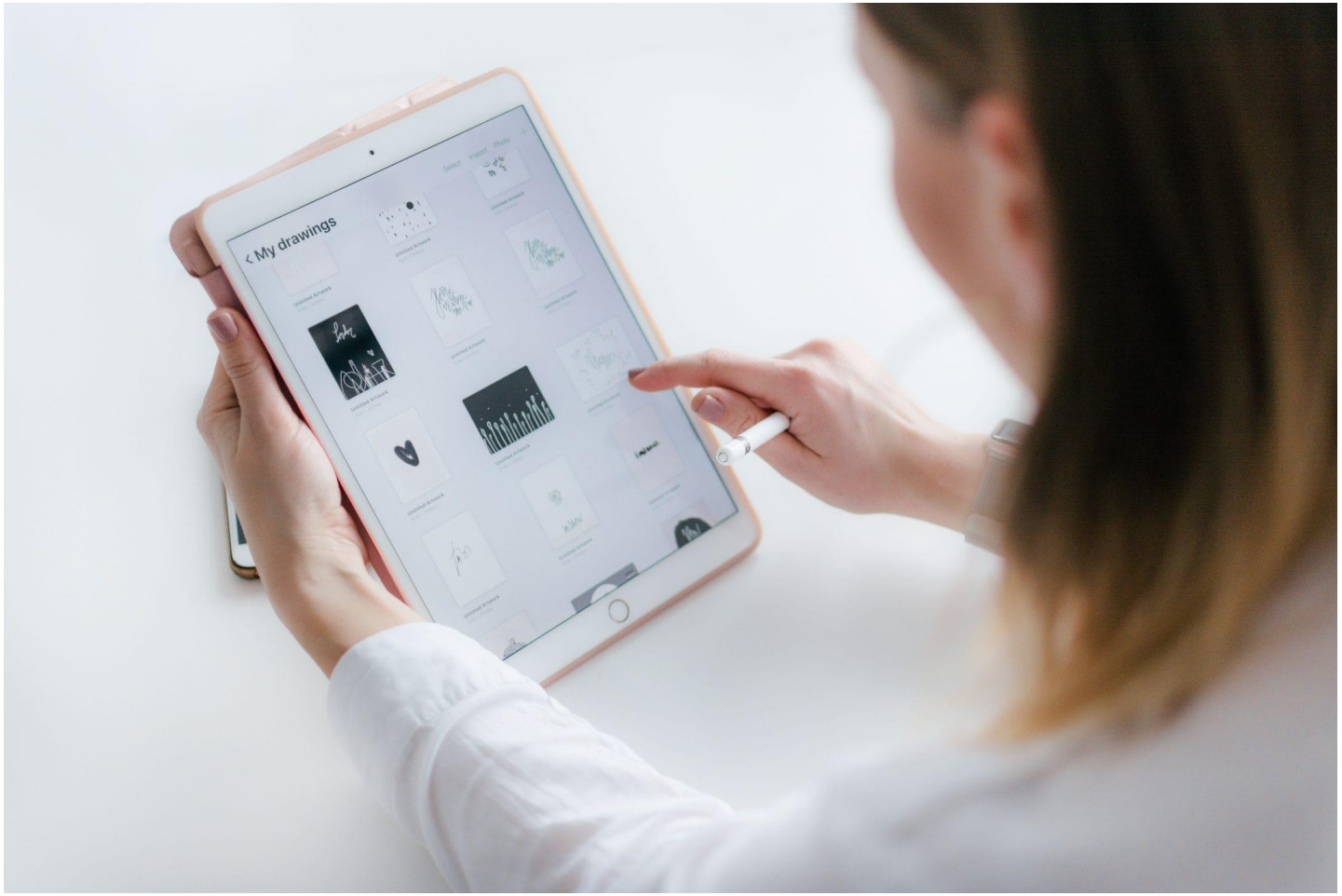
- **NON-FUNCTIONAL TESTING** is defined as a type of Software testing to check non- functional aspects (performance, usability, reliability, etc) of a software application.
- Non-functional testing is equally important as functional testing and affects client satisfaction.

- **Objectives of Non-functional testing**
- Non-functional testing should increase usability, efficiency, maintainability, and portability of the product.
- Helps to reduce production risk and cost associated with non-functional aspects of the product.

Usability Testing



Usability Testing

- Nowadays, we have n-numbers of application available in application store in order to help the people in their works.
- And where they can gives a negative response or a poor rating, which leads a particular product towards their ends before it is downloaded or installed by a limited number of end-users.
- In short, we can say that one bad review can damage all the resources skill, extended hours of planning, enthusiasm to develop the product, and so on.
- That is why **Usability testing** comes into the picture to resolve these types of issues, as usability testing has a vibrant significance and is executed by the test engineers throughout the **STLC (Software Testing Life Cycle).**

- Checking the user-friendliness, efficiency, and accuracy of the application is known as **Usability Testing.**
- In other words, we can say that Usability testing is one of the distinct testing techniques that identify the defect in the end-user communication of software product. And that's why it is also known as **User Experience (UX) Testing**.


01
Easy to understand
02
Easy to access
03
Look and feel
04
Faster to Access
05
Effective Navigation
06
Good Error Handling

- **Easy to Access**
- The look and feel of the application should be excellent and attractive to get the user's interest.
- The GUI of the software should be good because if the GUI is not well, the user may be lost his/her interest while using the application or the software.
- **Faster to Access**
- The software should be faster while accessing, which means that the application's response time is quick.
- If the response time is slow, it might happen that the user got irritated. We have to ensure that our application will be loaded within 3 to 6 seconds of the response time.

- **Effective Navigation**
- Effective navigation is the most significant aspect of the software. Some of the following aspects for effective navigation:
- Good Internal Linking
- Informative header and footer
- Good search feature
- **Good Error Handling**
- Handling error at a coding level makes sure that the software or the application is bug-free and robust.
- By showing the correct error message will help to enhance the user experience and usability of the application.

Various Strategies of Usability Testing/Usability Testing Methods

- Hallway Testing
- The next method of usability testing is **Hallway Testing**. It is one of the most successful and cost-saving approaches compared to the other usability testing methods.
- In hallway testing, some random people test the application **without having any earlier knowledge of the product instead of skilled professionals. As a result, we will get more precise outcomes and reliable responses for further enhancement**, if any of those random people test the application more efficiently.

- Laboratory Usability Testing
- In this method, the viewers are concerned about checking the performance of the test engineers regularly and reporting the results of testing to the related team.

- Expert Review
- Another general approach to usability testing is **Expert Review**. The Expert Review method includes the benefits of a professionals teams who have in-depth knowledge or experience in the specified field of performing usability tests.

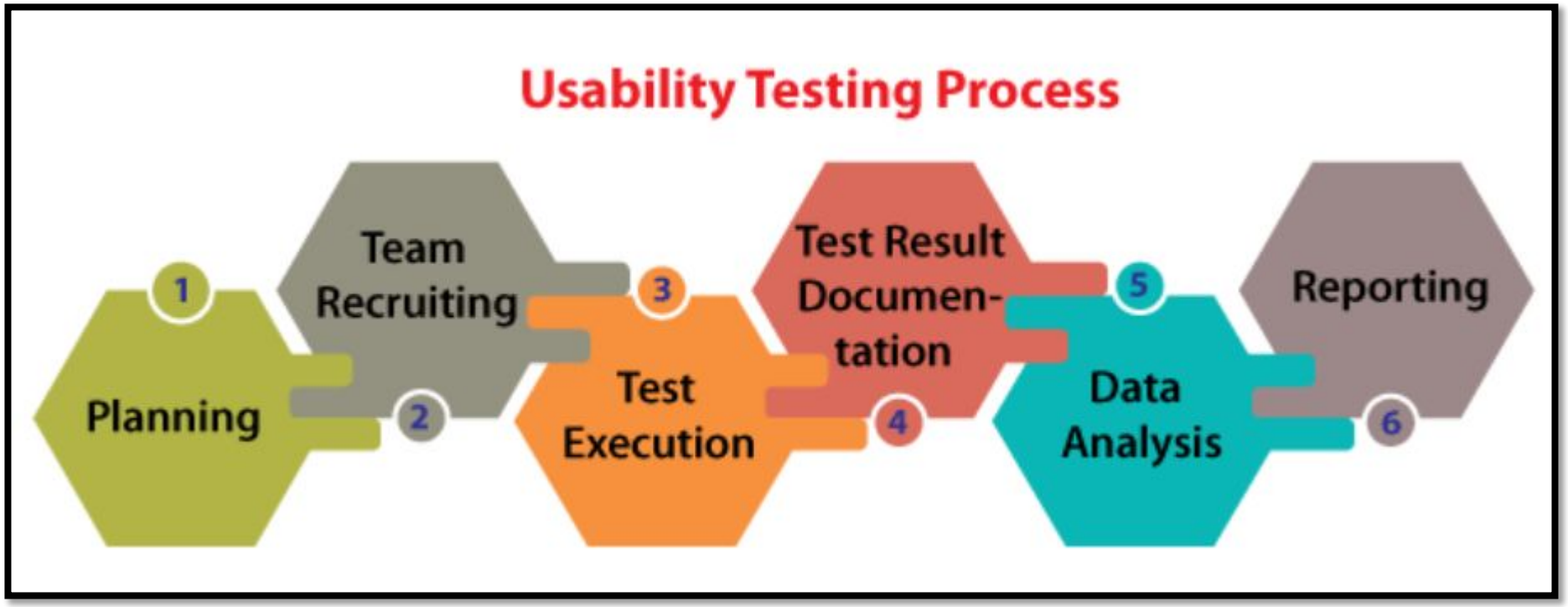
- Remote Usability Testing

  The test engineer and the observer is remotely located.

  The observer will observe the test engineer remotely.

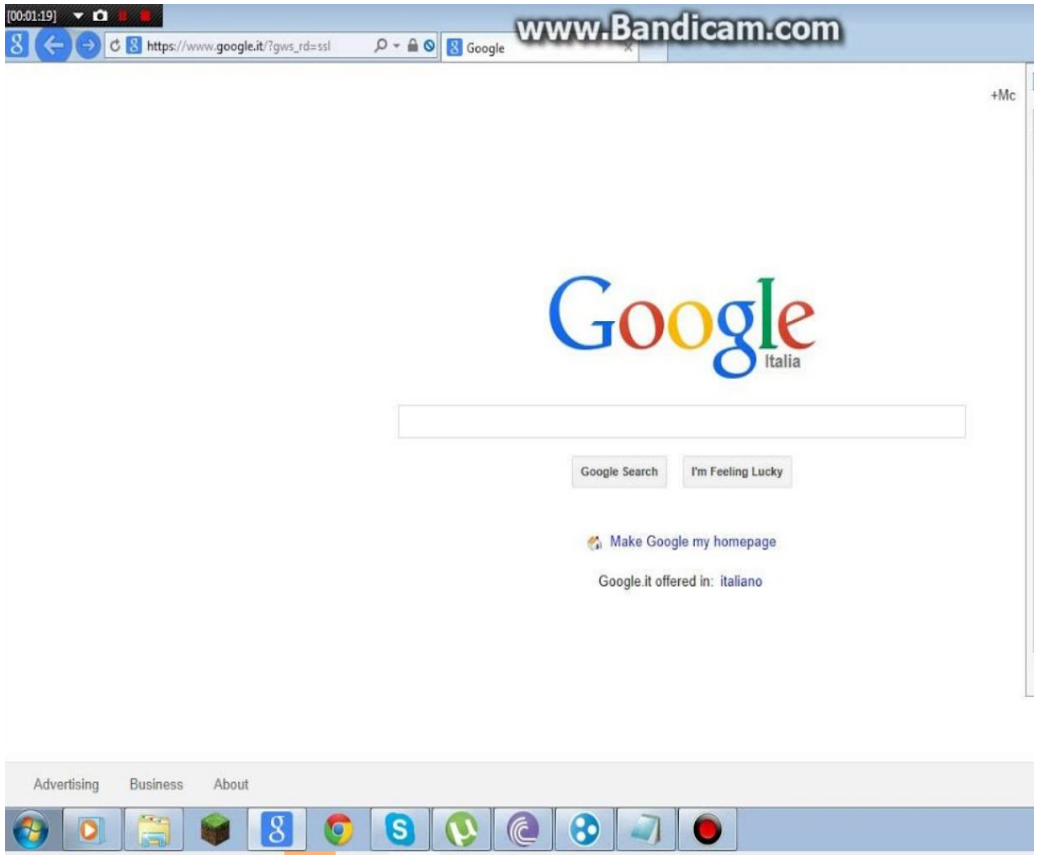
  Testers access the system under test remotely and perform the assigned tasks.

  Testers voice, screen activity, testers facial expression are recorded by the observer with the help of a software


Usability Testing Process
1
Planning
Team Recruiting
2
3
Test Execution
Test Result Documen-tation
4
5
Data Analysis
Reporting
6

Points to Remember in Usability Testing

- **Look & feel**
- **Navigation should be simple**
- **Speed**
- **Compatibility**
- **Help**
- **Location of components**
- **Features**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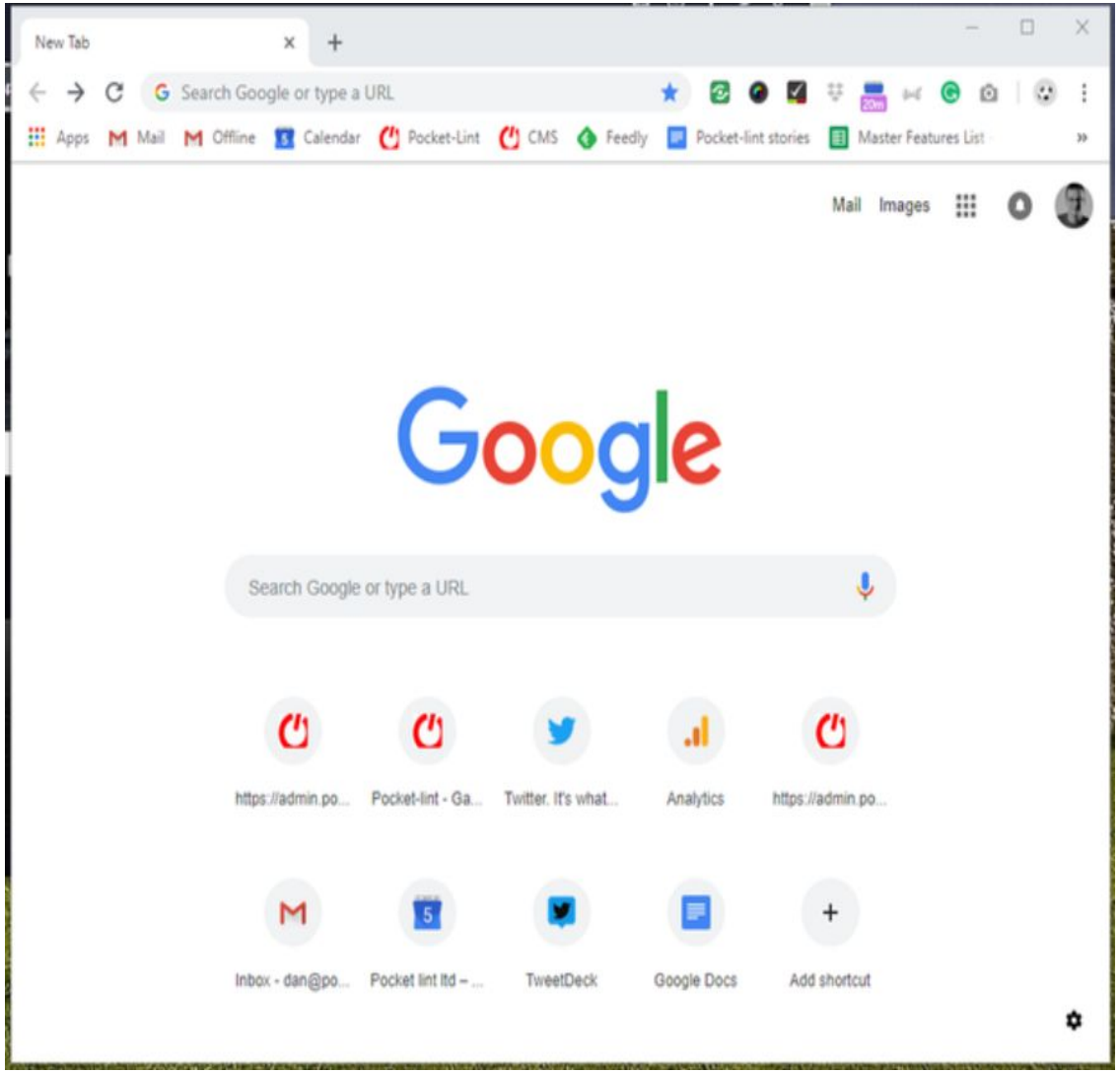
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Pocket-Lint
CMS
Feedly
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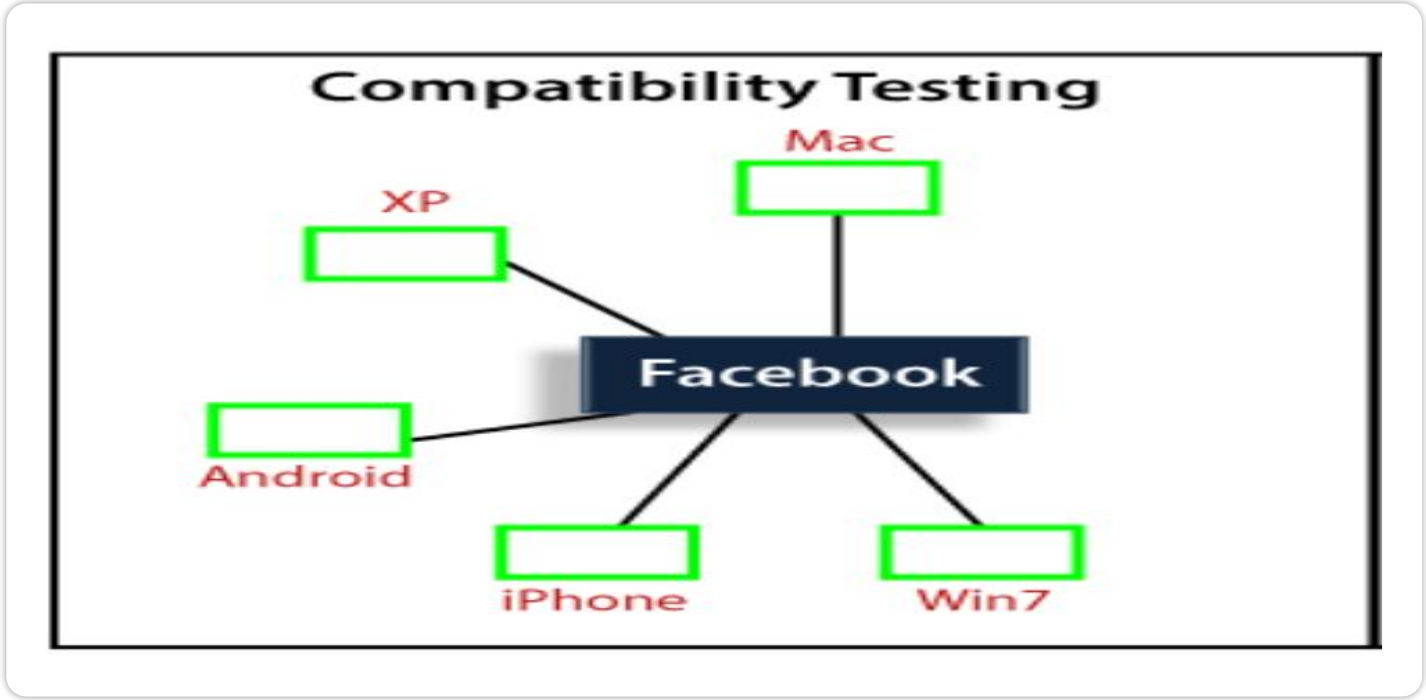
Compatibility testing

- Checking the functionality of an application on different software, hardware platforms, network, and browsers is known as compatibility testing.
- Why we use compatibility testing?
- Once the application is stable, we moved it to the production, it may be used or accessed by multiple users on the different platforms, and they may face some compatibility issues, to avoid these issues, we do one round of compatibility testing.


Compatibility Testing
Mac
XP
Facebook
Android
iPhone
Win7

Types of Compatibility testing

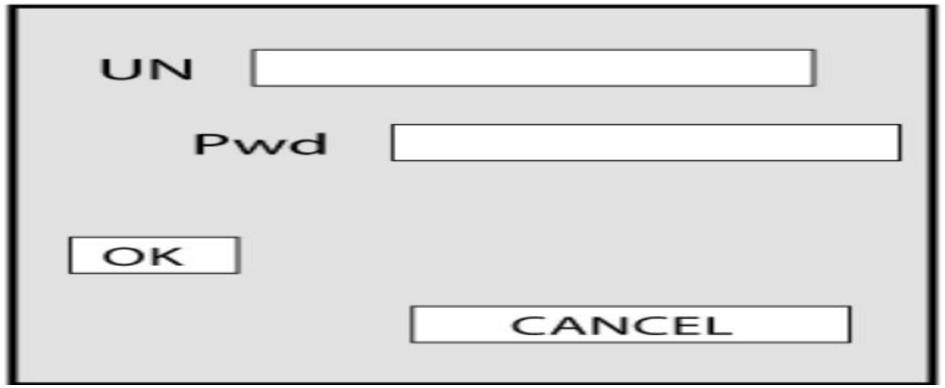
- **Different Operating System Compatibility Testing**
- **Different Operating System Version Compatibility Testing**
- **Different Browser Compatibility Testing**
- **Different Browser Version Compatibility Testing**
- **Different mobile device compatibility Testing**
- **Forward Compatibility Testing:** Test the software or application on the new or latest versions.
  For example: Latest Version of the platforms (software)
  Win 7 → Win 8 → Win 8.1 → Win 10
- **Backward Compatibility Testing:** Test the software or application on the old or previous versions.

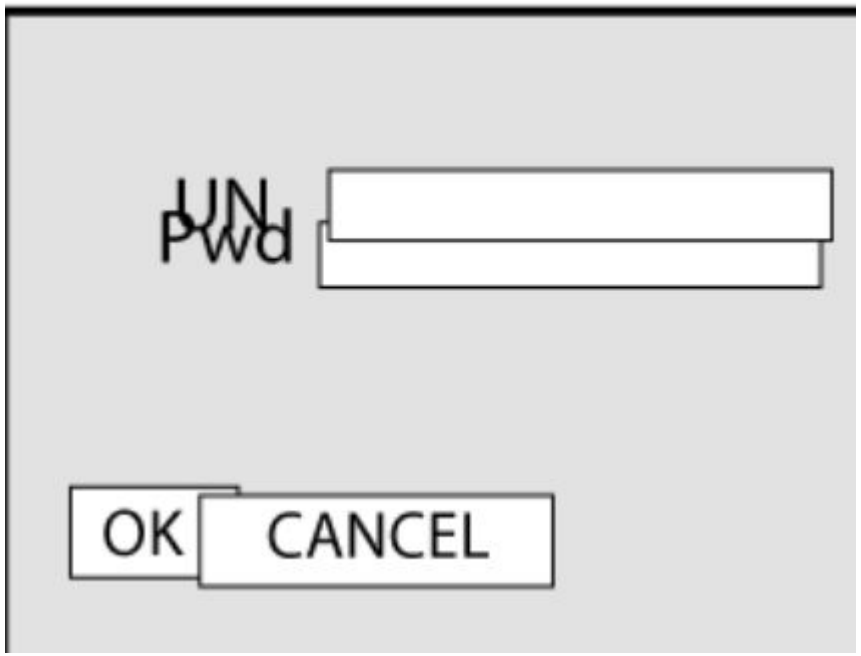
  For example:
  Window XP → Vista → Win 7 → Win 8 → Win 8.1

- And different browsers like **Google Chrome, Firefox,** and **Internet Explorer**, etc.
- Hardware Compatibility Testing
- The application is compatible with different sizes such as RAM, hard disk, processor, and the graphic card, etc.
- Network Compatibility Testing
- Checking the compatibility of the software in the different network parameters such as operating speed, bandwidth, and capacity.

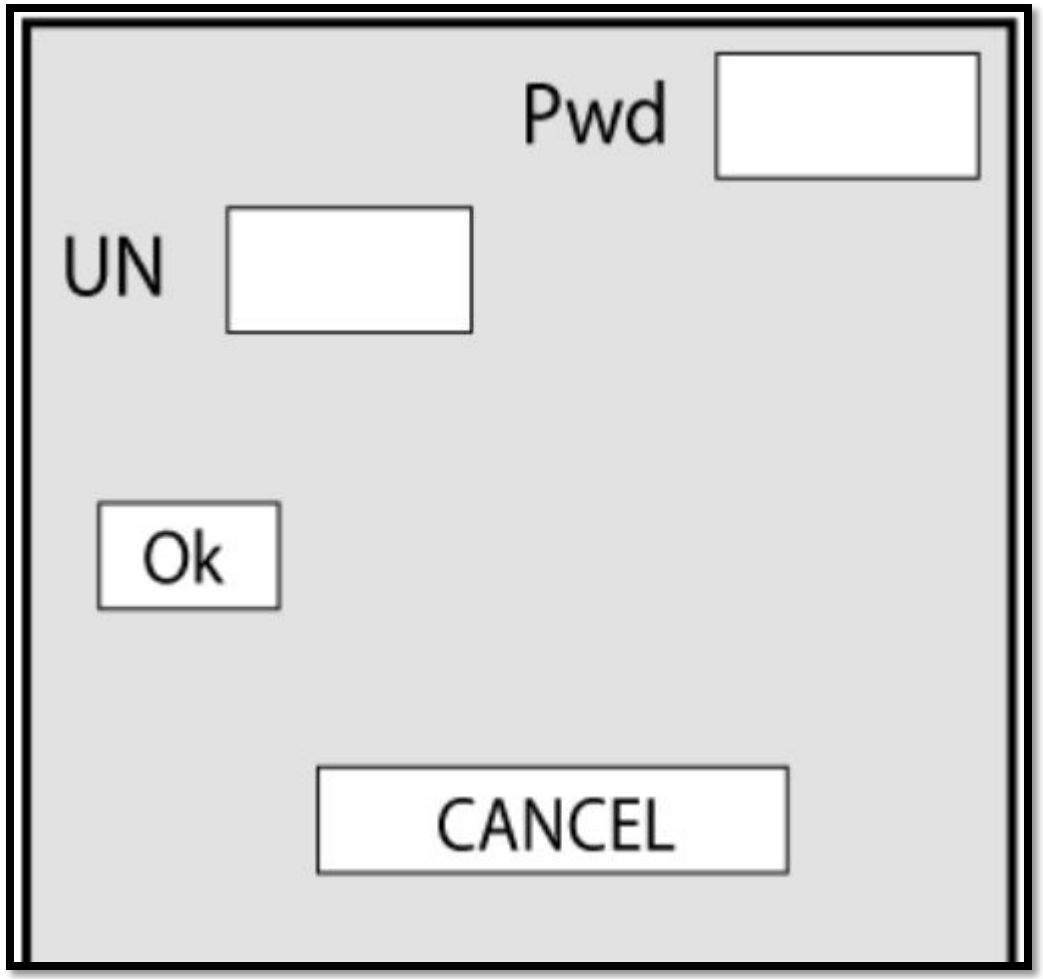
Compatibility testing bug/issue

- Alignment issue
- Overlap issue





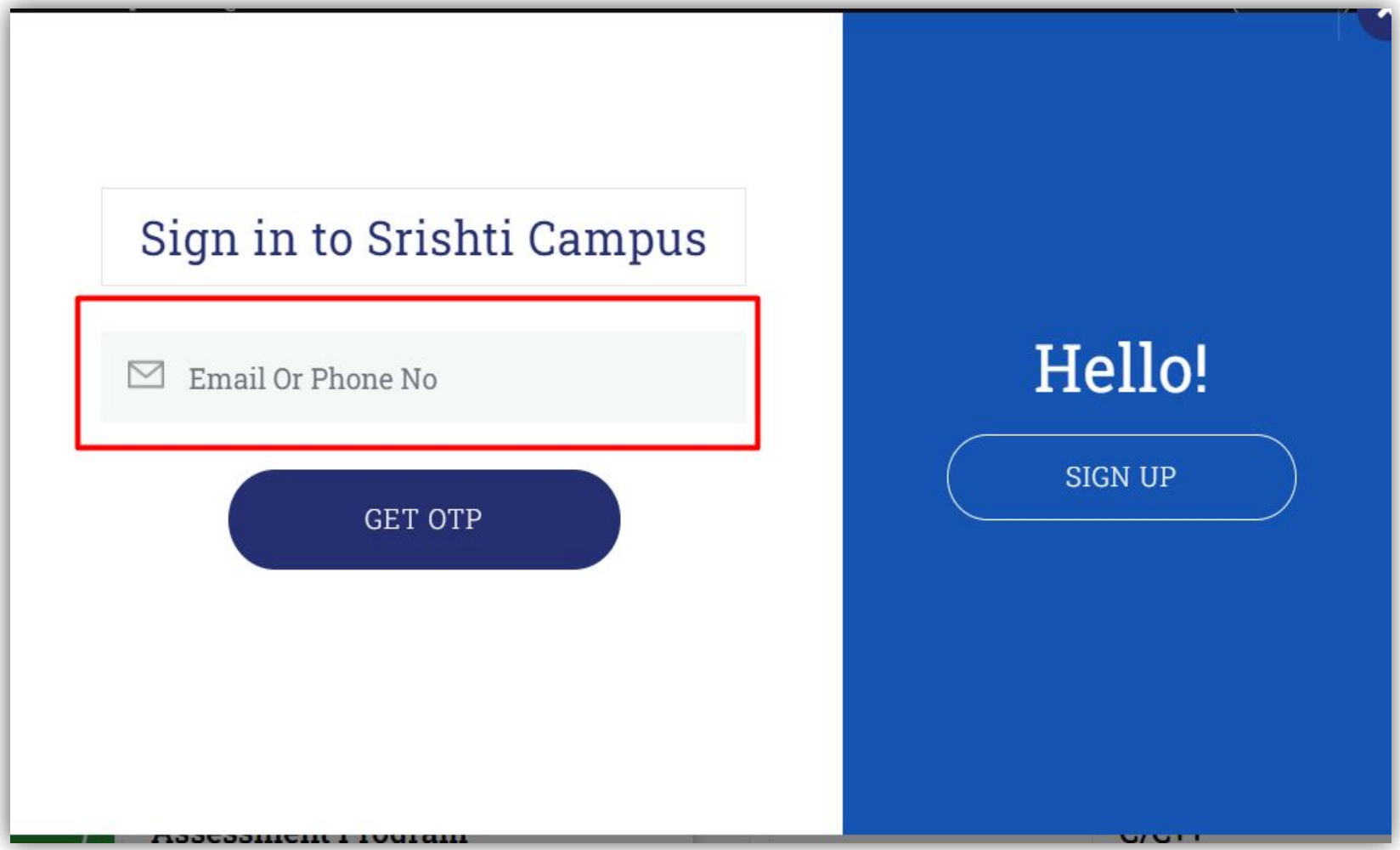
- Scattered issue



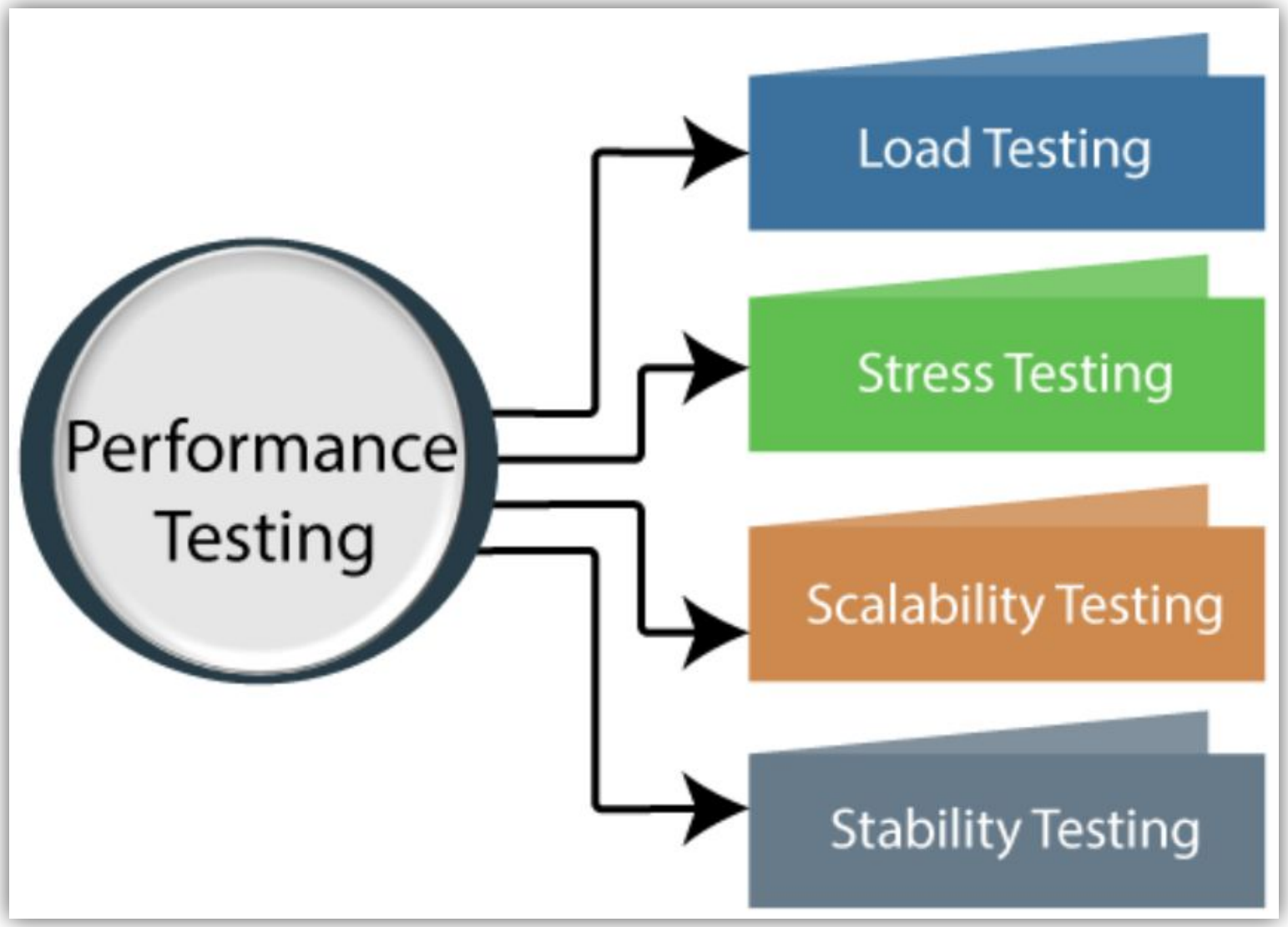
Performance testing

- Checking the behaviour of an application by applying some load is known as performance testing.
- we will concentrate on the various factors like Response time, Load, and Stability of the application.
- Response time: Response time is the time taken by the server to respond to the client's request.
- Eg: psc website not loading, site busy
- Load: Here, Load means that when N-number of users using the application simultaneously or sending the request to the server at a time.
- Eg :otp request
- Stability: For the stability factor, we can say that, when N-number of users using the application simultaneously for a particular time.

Eg: app crashing


Sign in to Srishti Campus
Email Or Phone No
GET OTP
Hello!
SIGN UP

Types of Performance Testing



Load testing

- The load testing is used to check the performance of an application by applying some load which is **either less than** or **equal to the desired load** is known as load testing.
- **For example: 1000 users** are the **desired load**, which is given by the customer, and **3/second** is the **goal** which we want to achieve while performing a load testing.

Stress Testing

- The stress testing is testing, which checks the behavior of an application by applying load **greater than** the desired load.
- **For example:** If we took the above example and increased the desired load 1000 to 1100 users, and the goal is 4/second.

Scalability Testing

Checking the performance of an application by increasing or decreasing the load in particular scales (no of a user) is known as **scalability testing**. Upward scalability and downward scalability testing are called scalability testing.

- Scalability testing is divided into two parts which are as follows:
- **Upward scalability testing**
- **Downward scalability testing**
- **Upward scalability testing**
- It is testing where we **increase the number of users on a particular scale** until we get a crash point. We will use upward scalability testing to **find the maximum** capacity of an application.

Downward scalability testing

- The downward scalability testing is used when the **load testing is not passed,** then start **decreasing the no. of users in a particular interval** until the goal is achieved. So that it is easy to identify the bottleneck (bug).
- Stability Testing
- Checking the performance of an application by **applying the load for a particular duration of time** is known as **Stability Testing**.
- Eg:24 hrs,48 hrs

Volume testing

Volume testing is testing, which helps us to check the behaviour of an application by inserting a massive volume of the load in terms of **data** is known as volume testing, and here, we will concentrate on the number of data rates than the number of users.

Security Testing

- It is used to test the vulnerability of the application and is used to check whether its data and resources are protected.

- It is used to test the security of the application like authentication(username, password), authorization, confidentiality, OTP, captcha etc…

Security related terms/ Security Words

- Confidentiality : Data should be confidential
- Authentication: Checking the user access based on the username and password
- Authorization: Checking the user access based on the privilege
- OTP : One Time Password
- Captcha: It is the part of additional security. Used for identifying the user accessed is a tool or robot
- SQL injection: Hacking the application after injecting the SQL queries
- VAPT : Vulnerability Assessment and Penetration testing

  Analysing the unprotected area and do the security testing
- OWASP: Open Web Application Security Project

Security Testing Tools

- Vega
- Zenmap
- Nmap
- Burpsuit
- Nessus

Database Testing

- It is the part of Non functional requirement Testing
- Testing the database using SQL language for creating, listing, updating and deleting a particular item

Localization Testing/ L10N

- It is the part of NFR testing
- Testing the localized version of the application for its local language, local culture and local setting

Globalization Testing

- It is the part of the NFR testing
- Globalization Testing is a type of software testing that is performed to ensure the system or software application can function independent of the geographical and cultural environment. It ensures that the application can be used all over the world and accepts all the language texts.

Objective of Globalization Testing

- To check the different aspects of software application.
- To ensure the use of software application all over the world.
- To ensure the software supports all the languages.
- To determine the user interface of the software application.

- **Sensitivity to the language vocabulary:**

A product that is used all over the world needs to support many languages.

Different Language translator are used to verify if the application uses proper vocabulary for each language.

Application is used to switch to different languages and the performance and response of the application is tested

Date and time formatting:

- Date and time formats vary from one place to another.

- India date format : dd/mm/yyyy
- US date format : mm/dd/yyyy
-
- Hence application should support all types of format
- In time, application should support 24 hour notation and 12 hour notation

Currency Format:

- Currency formats vary from one country to another.
- So, application should support all kind of the formats.
- Application should also display the correct symbol of currency and the units.
- India – Rupees
- US - Dollar

Phone and mobile number formatting:

- Every country has different phone and mobile number formats. Also the ISD varies from one country to another country. So, the application should take care of it.
- India - +91
- UK - +44

Address Formatting:

- Address formats also vary from one country to another.
- In India it is different where in UK it is different.

Zip Code Format:

- The zip code format also changes from one country to another.