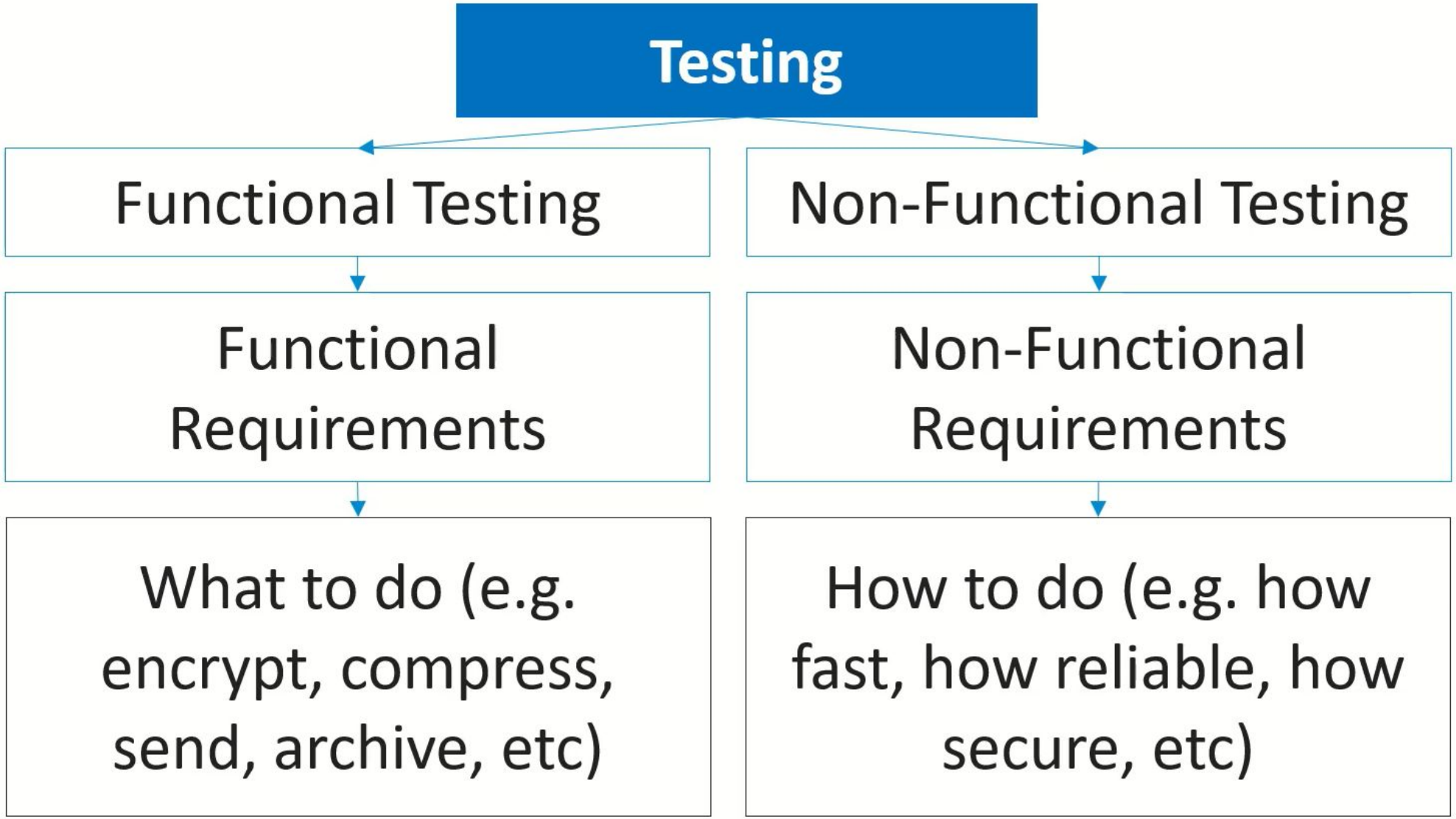
SOFTWARE TESTING CLASSIFICATION

ENGLISH WITH JULLY

May 26, 2021

TESTING CLASSIFICATION

Two Fundamental Approaches: Functional and Non-Functional Testing



Functional and Non-Functional Testing

Read and remember!

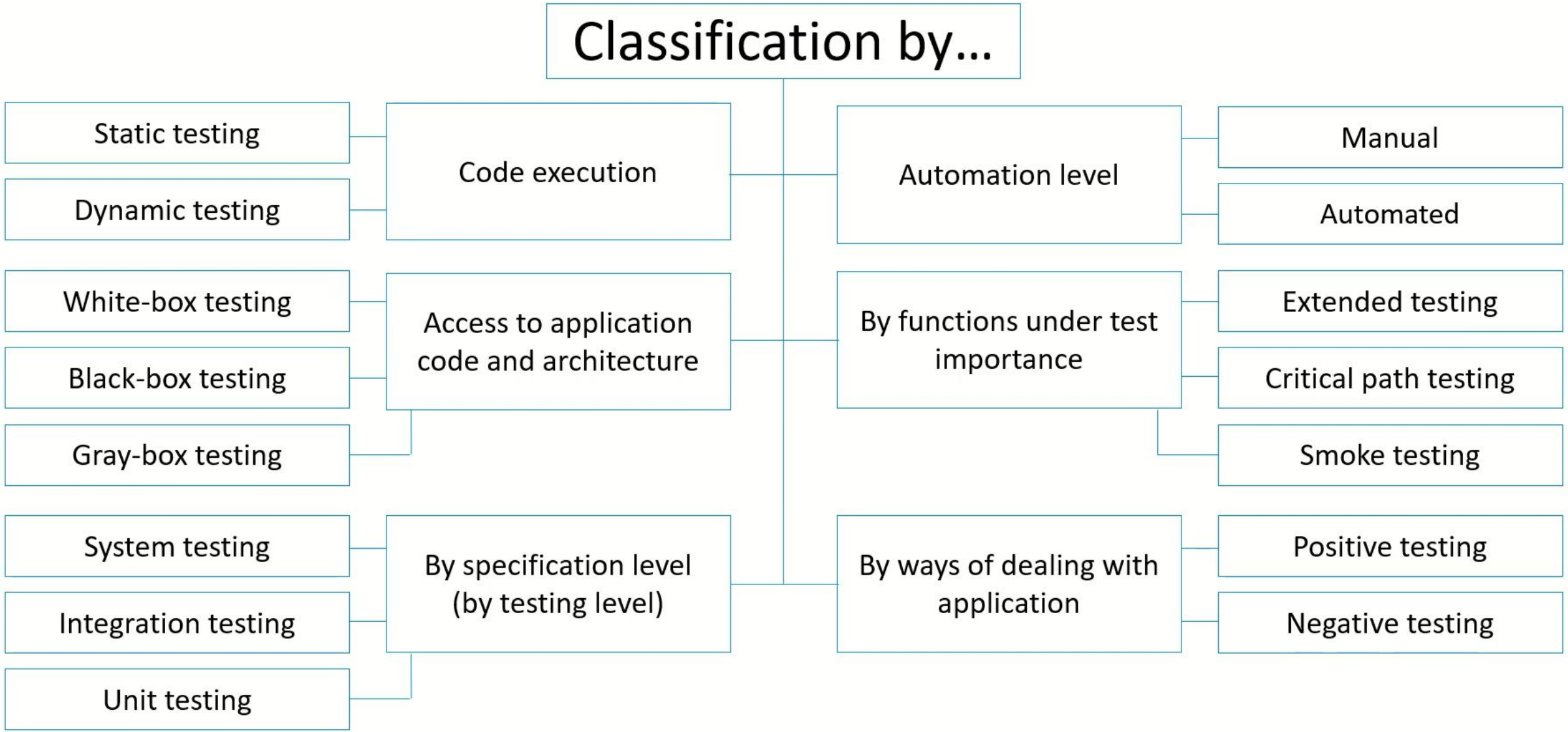
Functional testing – testing conducted to evaluate the compliance of a component or system with functional requirements.

Functional requirement – a requirement that specifies a function that a component or system must be able to perform.

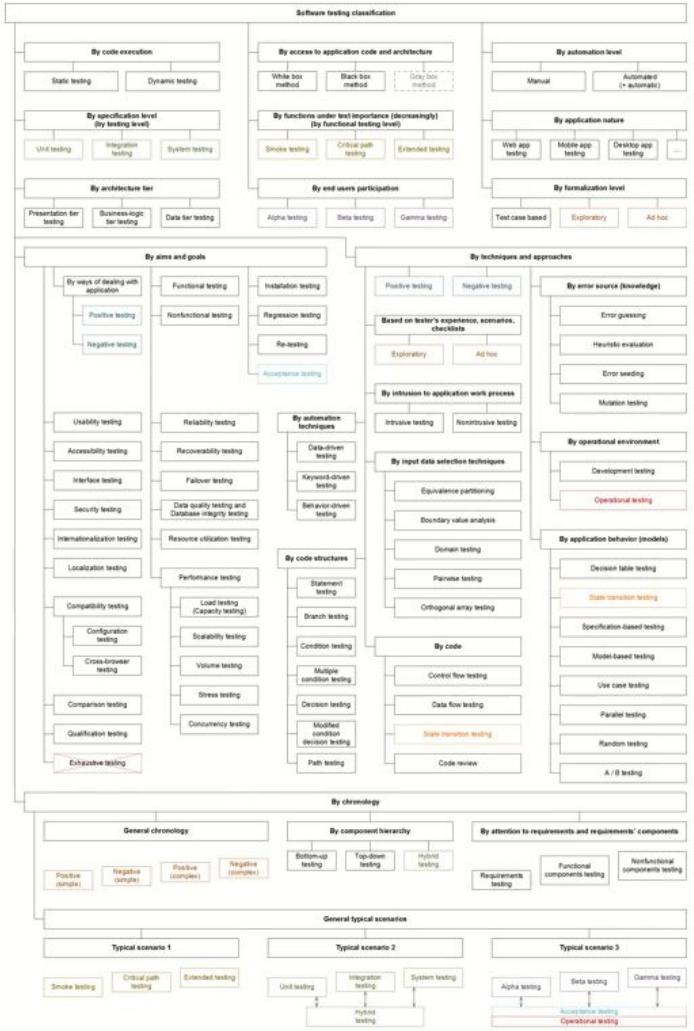
Non-functional testing – testing conducted to evaluate the compliance of a component or system with non-functional requirements.

Non-functional requirement – a requirement that describes how the component or system will do what it is intended to do.

General Classification Approach



General Classification Approach: There Is Much More!



Please, visit:
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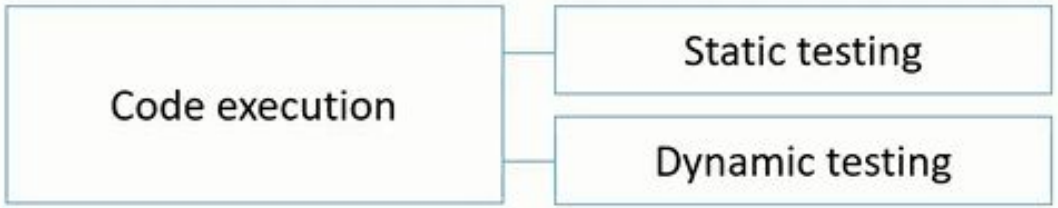
Classification by code execution

Read and remember!

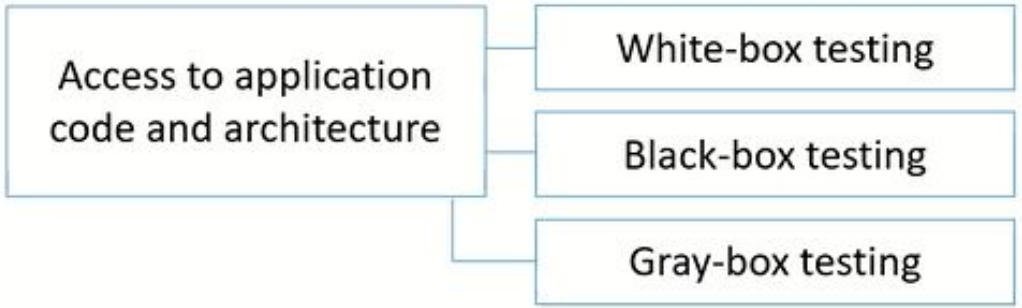


Static testing – testing a work product without code being executed.

Dynamic testing – testing that involves the execution of the software of a component or system.

… by access to application code …

Read and remember!



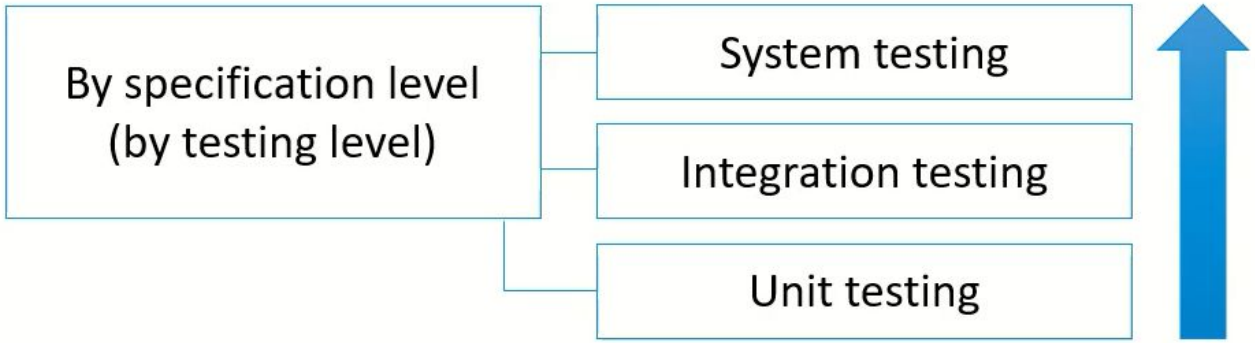
White-box testing – testing based on an analysis of the internal structure of the component or system.

Black-box testing – testing, either functional or non-functional, without reference to the internal structure of the component or system.

Gray-box testing – testing, which is a combination of Black-box and White-box (i.e. the internal structure is partially known).

Classification by specification level

Read and remember!



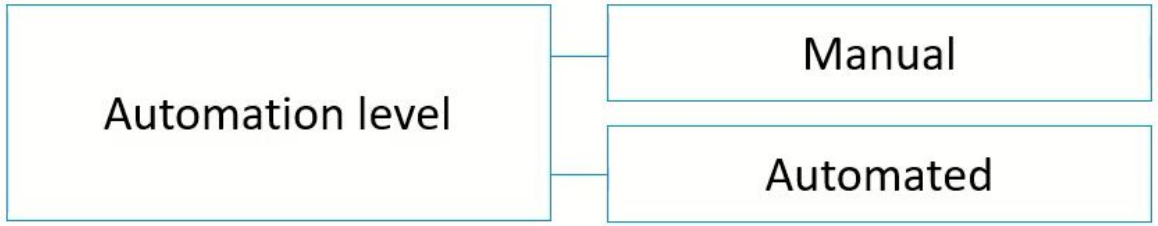
Unit testing – the testing of individual hardware or software components.

Integration testing – testing performed to expose defects in the interfaces and interactions between integrated components or systems.

System testing – testing an integrated system to verify that it meets specified requirements.

Classification by automation level

Read and remember!

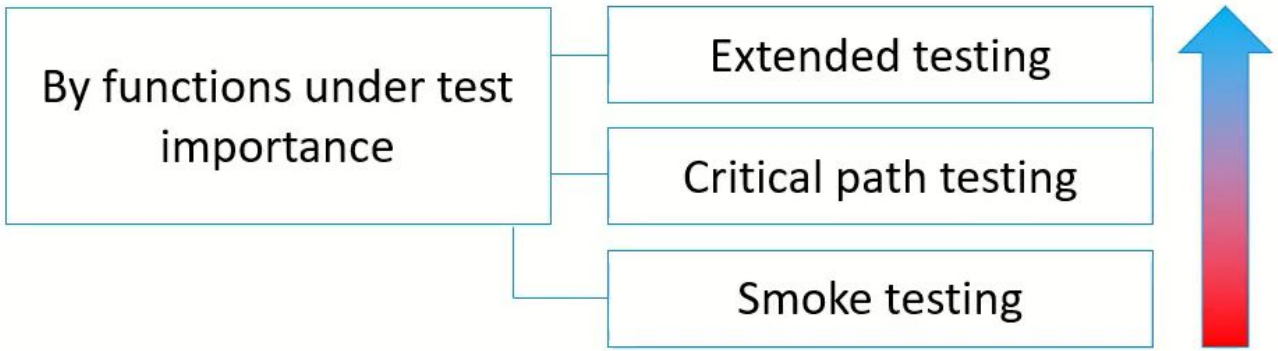


Manual testing – testing performed by the tester who carries out all the actions on the tested application manually.

Automated testing – the use of software to control the execution of tests, the comparison of actual outcomes to predicted outcomes, the setting up of test preconditions, and other test control and test reporting functions.

… by functions under test importance

Read and remember!



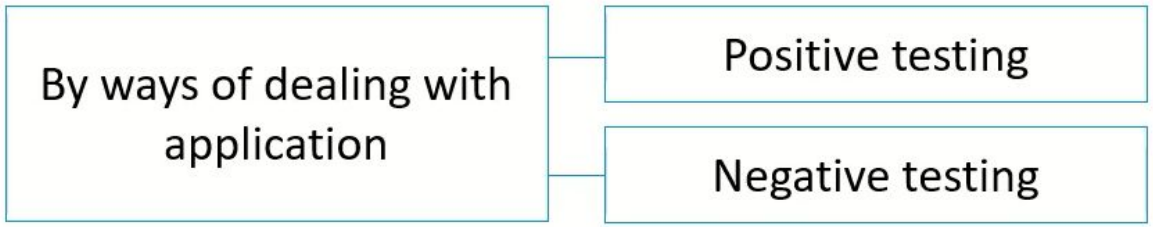
Smoke test – a subset of all defined test cases that cover the main functionality of a component or system, the most crucial functions.

Critical path test – test cases that cover the functionality used most of the time by the majority of users.

Extended test – test cases that cover the “nice-to-have” functionality (not used most of the time by the majority of users).

… by ways of dealing with application

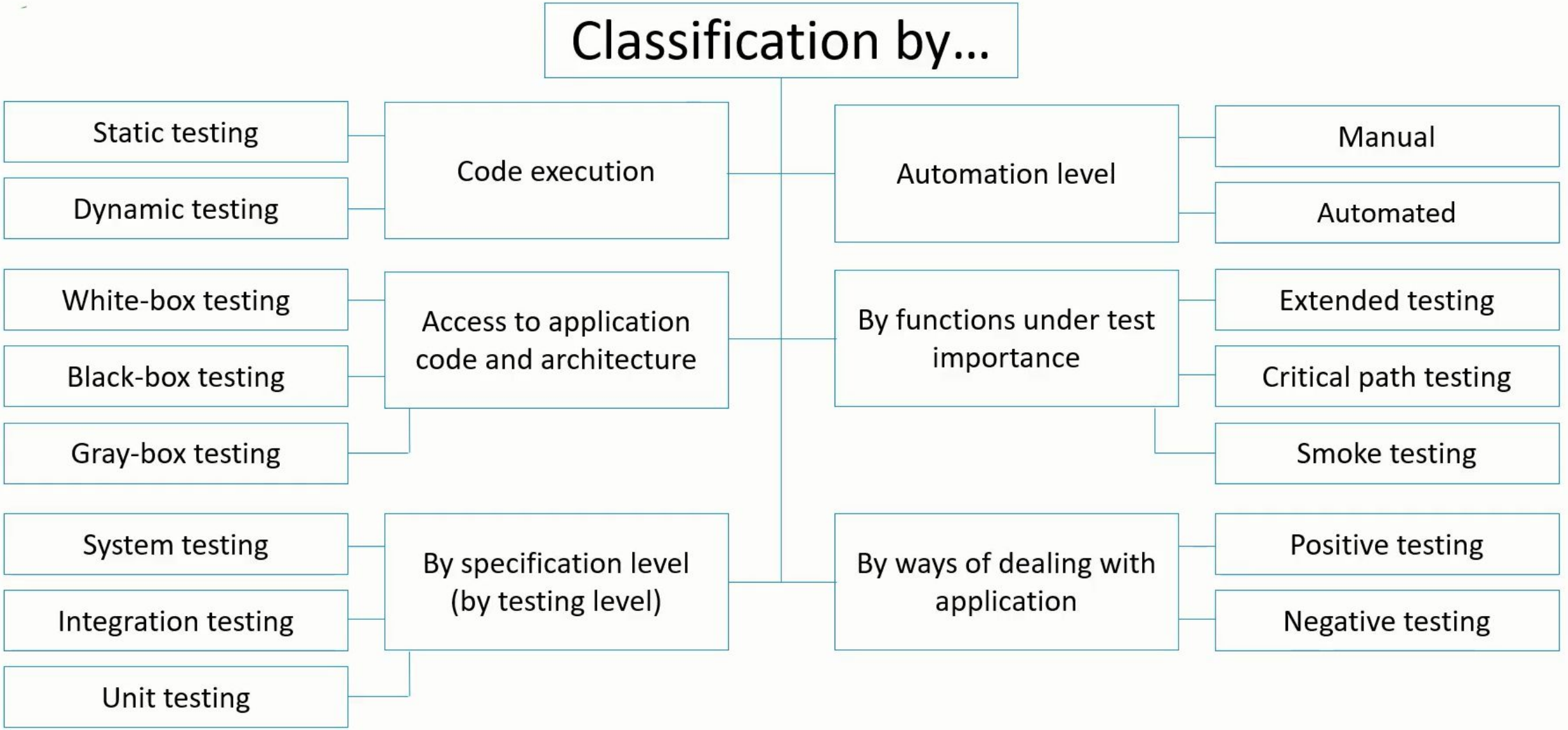
Read and remember!



Positive testing – testing process where the system validated against the valid input data and valid set of actions.

Negative testing – tests aimed at showing that a component or system does not work.

Let’s look at the big picture one more time…



TEST PLANNING

Main Definitions

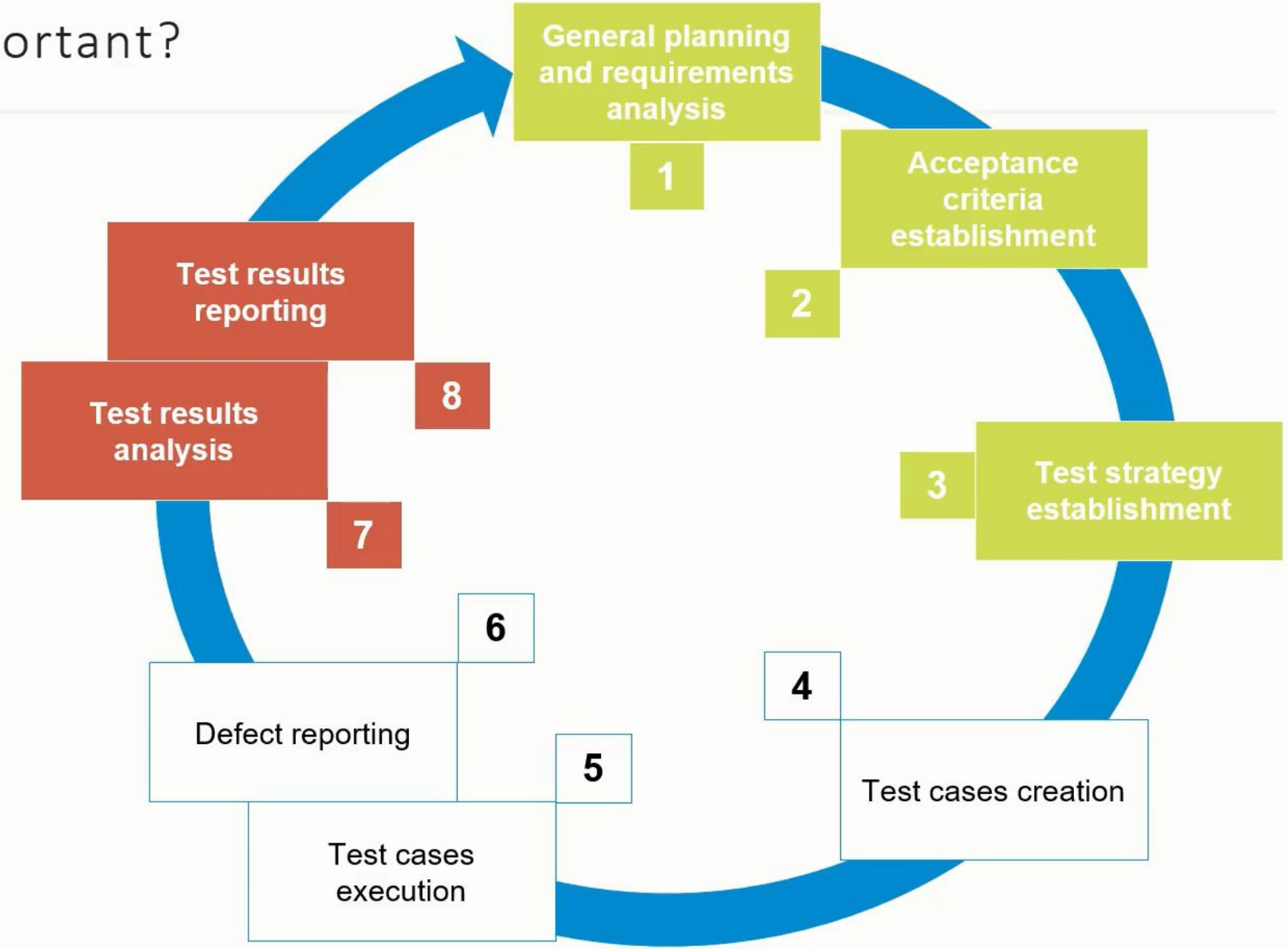
Read and remember!

Test planning – the activity of establishing or updating a test plan.

Test plan – documentation describing the test objectives to be achieved and the means and the schedule for achieving them, organized to coordinate testing activities.

Why is Test Plan so important?

Test Plan is the basis for all further activities, it is a map to the defined destination, a starting point to the reporting and so on and so forth…



Planning Tasks and Goals (part 1)

Planning Tasks and Goals

Estimation of work scope and complexity	Designation of resources and ways to acquire them	Definition of schedule and milestones
Risk mitigation and countermeasures definition	Distribution of duties and responsibilities	Coordination of team-effort between teams/projects/groups

Planning Tasks and Goals (part 2)

Test Plan helps us to…

Get better results with less effort	Optimize resources usage, avoid waste	See the progress at any given moment
Understand what to do in any situation	Get better understanding between people	Cooperate better

TEST PLAN SECTIONS

Main Definition

Read and remember!

Test plan – documentation describing the test objectives to be achieved and the means and the schedule for achieving them, organized to coordinate testing activities.

General Test Plan Sections Overview

- Project scope and main goals
- Requirements to be tested
- Requirements NOT to be tested
- Test strategy and approach
- Criteria
- Resources
- Schedule
- Roles and responsibilities
- Risk evaluation
- Documentation
- Metrics
- …

Read and remember!

Project scope and main goals – a very brief description of the purpose of the application development.

This section is reminiscent of business requirements, but here the information is presented in an even more condensed form with an emphasis on the most important tasks.

E.g.:

Correct automated conversion of text documents in different source encodings to one destination encoding with performance significantly higher than human performance during the same actions.

Requirements to be tested

Read and remember!

Requirements to be tested – the list of functional and / or non-functional requirements to be tested.

Not each and every requirement should be tested. Here we list those ones that should be covered with test-cases.

E.g.:

- *UR-1.*: smoke test.*
- *UR-2.*: smoke test, critical path test.*
- *UR-3.*: critical path test.*
- *BR-1.*: smoke test, critical path test.*
- *QA-2.*: smoke test, critical path test*

Play

Requirements NOT to be tested

Read and remember!

Requirements NOT to be tested – the list of functional and / or non-functional requirements NOT to be tested.

As not each and every requirement should be tested, here we list those ones that should NOT be covered with test-cases. For each requirement we write the reason why shouldn't we test it.

E.g.:

- *SC-1: the application is a console one by design.*
- *SC-2, L-1: the application is developed with proper PHP version.*
- *QA-1.1: this performance characteristic is at the bottom border of typical operations performance for such applications.*

Read and remember!

Test strategy and approach – the description of the testing process in terms of the methods used, approaches, types of testing, technologies, tools, etc.

This description allows us to use the most effective and efficient way to achieve project goals in terms of quality.

E.g.:

Due to the team cross-functionality, a significant contribution to quality improvement can be expected from the code review combined with manual testing using the white box method. Unit-testing will not be applied due to extreme time limitations.

Criteria

Read and remember!

Criteria – the list of miscellaneous testing criteria, such as acceptance criteria, entry criteria, suspension criteria, resumption criteria, exit criteria, etc.

Usually, each criterion has a reference to proper metric. Otherwise the decision on criterion fulfillment may be too subjective.

E.g.:

Testing resumption criteria: more than 50% of bugs found during the previous iteration are fixed (see "Ongoing defects fixed percentage" metric).

Read and remember!

Resources – the list of miscellaneous project resources, such as software, hardware, staff, time, finance, etc.

Usually, finance resources are too confidential to be included in test-plan, so only a reference to the budget is mentioned here.

E.g.:

- *Software: four virtual machines (two with Windows 10 Ent x64, two with Linux Ubuntu 18 LTS x64), two PHP Storm licenses (latest version available).*
- *Hardware: two standard workstations (8GB RAM, i7 3GHz).*

Schedule

Read and remember!

Schedule – in fact, this is a kind of calendar with milestones and periods marked on it.

When the project is long enough (months and years long) there is no need to have a detailed schedule for the far future: the schedule may be adjusted and filled with details once we reach one milestone or another.

E.g.:

- *25.05 – requirements testing and finalizing.*
- *26.05 – test-cases and scripts for automated testing creation.*
- *27.05-28.05 – main testing stage.*
- *29.05 – testing finalization, reporting.*

Roles and responsibilities

Read and remember!

Roles and responsibilities – the list of all key project roles (related to the testing process) with their key areas of responsibility.

Though this list is rather unified for most projects, there may be some special cases, so this section usually is not omitted.

E.g.:

- *Senior developer: participation in requirements testing and code review.*
- *Tester: documentation creation, test-cases execution, participation in code-review.*

Risk evaluation

Read and remember!

Risk evaluation – the list of risks that are likely to arise during the project. For each risk there is a probability evaluation and some options for resolving the situation.

There are a lot of typical risks (actual for every project) so no need to list such risks here. This section is for risks specific (or even unique) to the project.

E.g.:

- *Personnel (low probability): if any team member is inaccessible, we can contact the representatives of the "Cataloger" project to get a temporary replacement (the commitment from the "Cataloger" PM John Smith was received).*

Read and remember!

Documentation – the list of test documentation with details on who should prepare it, when, how, etc.

This section is extremely useful when onboarding a new project member. As sometimes documentation list may consist of dozens of items, it's good to have them listed in one place.

E.g.:

- *Requirements. Responsible person – tester, deadline – 25.05.*
- *Test cases and defect reports. Responsible – tester, creation period – 26.05-28.05.*
- *Test result report. Responsible person – tester, deadline – 29.05.*

Read and remember!

Metrics – the list of numerical characteristics of quality indicators, methods for their evaluation, formulas, etc.

This section is actively referenced by “Criteria” section. Metrics have their dark side too, but in general it is better to have some objective way to tell the current project situation.

E.g.:

Test cases success percentage:

$$T^{SP} = \frac{T^{Success}}{T^{Total}} \cdot 100\%, \text{ where}$$

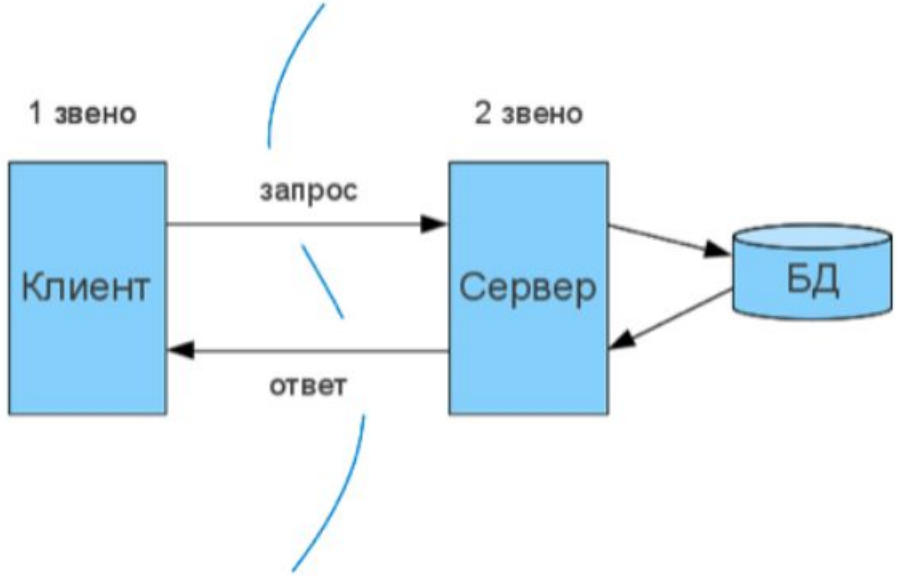
T^{SP} – *percentage of successfully passed test cases,*
$T^{Success}$ – *quantity of successfully passed test cases,*
T^{Total} – *total quantity of executed test cases.*

CLIENT-SERVER ARCHITECTURE

Two-tier architecture - the distribution of three basic components between two nodes (client and server).

A web application is a client-server application in which the browser is the client and the web server (broadly speaking) as the server.

The client is a browser, **a web server** is a server that accepts HTTP requests from clients and issues HTTP responses to them.



A database is an information model that allows you to orderly store data about an object or a group of objects that have a set of properties that can be categorized.

more information here

ESTIMATION

Estimation - the score determines how much money, effort, resources, and time it will take to build a particular system or product.

Method in Agile – Story points

Story points measure the effort it takes to complete a product backlog item or any other piece of work.

How much is known about the task	Everything	Almost everything	Something	Almost nothing	Nothing	Nothing
Dependencies	None	Almost none	Some	Few	More than few	Unknown
How much work effort	Less than 2 hours	Half a day	Up to two days	Few days	Around a week	More than one week
Story Points	**1**	**2**	**3**	**5**	**8** Should be split into smaller items	**13** Must be split into smaller items

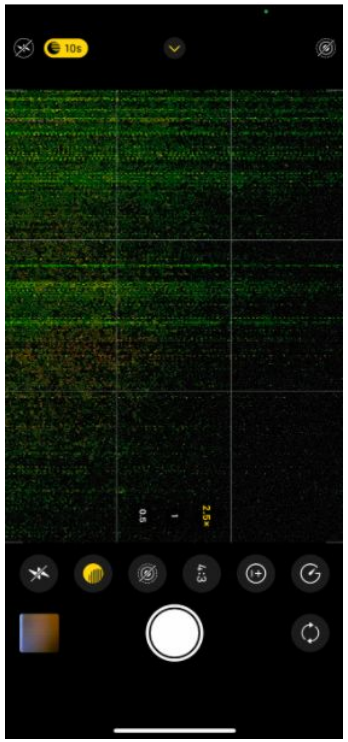
CONFUSING MOMENTS

Feature of Bug?

A feature is slang, the name of certain signs of an object or phenomenon. In other words, these are its features, unusual properties.

The bug means an issues in a program or application.

BUG



FEATURE

ERROR/MISTAKE/FAULT/ BUG/DEFECT/FAILURE?

If someone makes **an error** or **mistake** in using the software, this may lead directly to a problem - the software is used incorrectly and so does not behave as we expected.

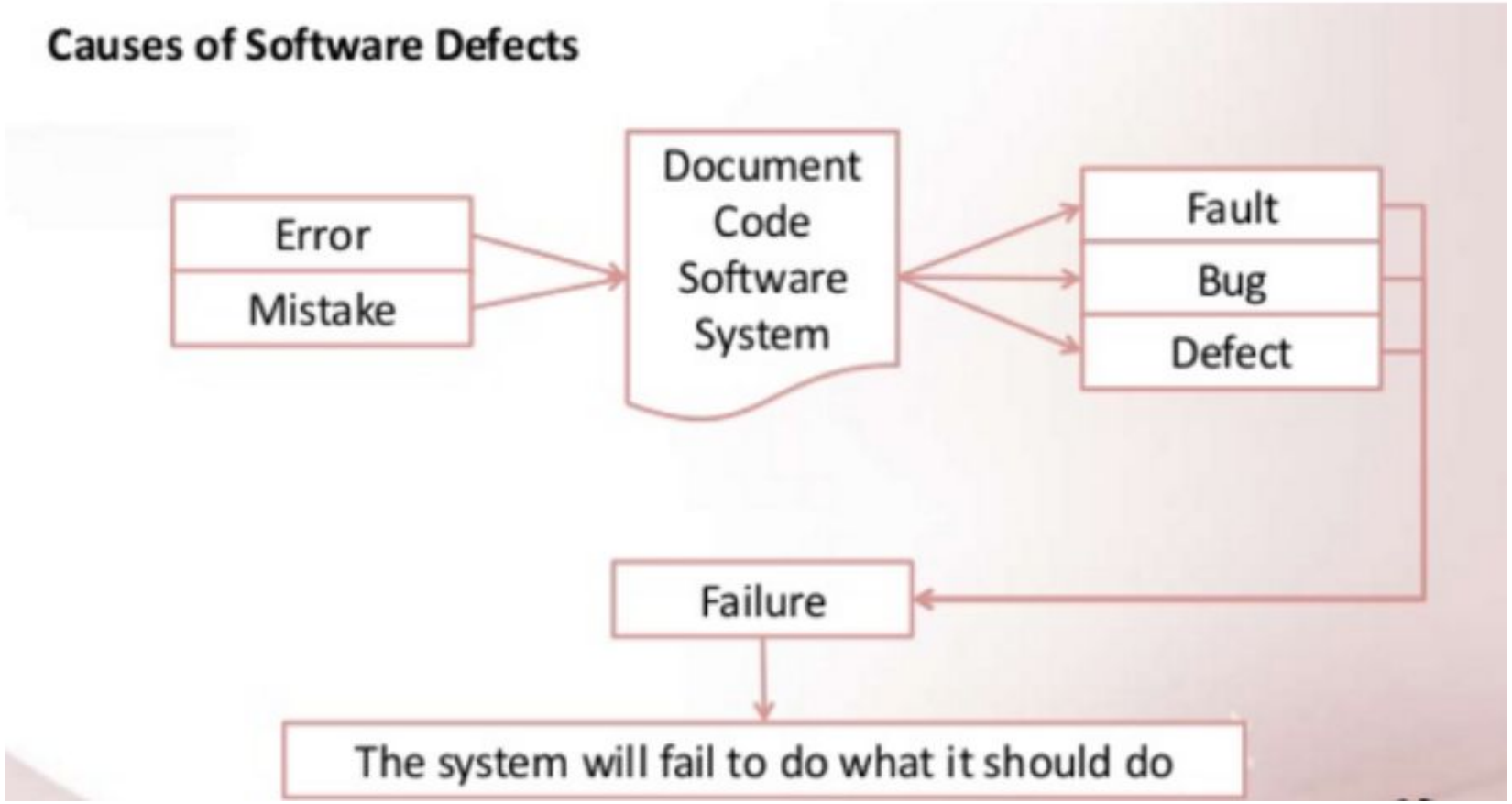
A Bug is the result of a coding Error or Fault in the program which causes the program to behave in an unintended or unanticipated manner. **Bugs** arise from mistakes and errors, made by people, in either a program's source code or its design

A Defect is a deviation from the Requirements.

Failure is a deviation of the software from its intended purpose. It is the inability of a system or a component to perform its required functions within specified performance requirements

Causes of Software Defects

IMPORTANT!



THANK YOU!

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