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Version
V1.1

Engenharia de Software II

Introdução

Summary | Contextualização da UC • Roadmap da UC

It's not only about **programming**

It's about to know

What to Program (code)

How to Program (code)

To Whom and **with Whom**

When to Release and **How Often**

It's about to

Manage, **measure**, **maintain** SW products

Engenharia de Software II

It's about

Producing high quality software products

Quality software products production

Engenharia de Software II

It's about

Engineering the software development

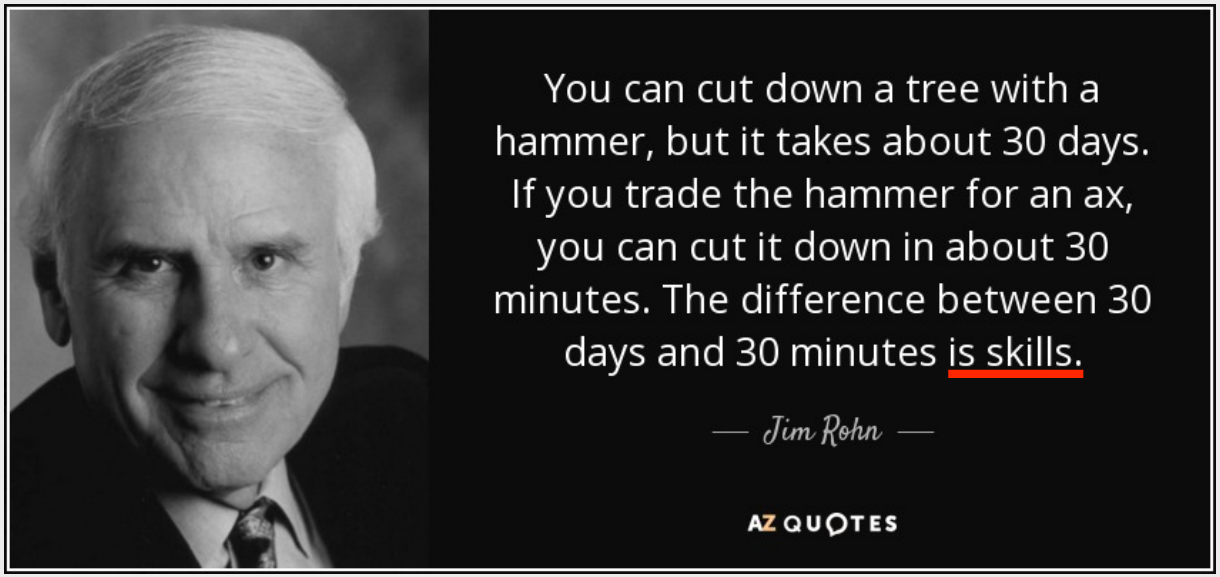
Imagine there's a tree that we must cut out!

*Can we cut that tree with a **hammer**?*

Yes, but…

*wouldn't it better with an **ax**?*

All about skills!



Actually, to cut a tree

- Wear the Right Safety Gear
- Buy Felling Wedges
- Estimate the Felling Zone
- Clear a Cutting Zone
- Size Up the Tree
- Anatomy of a Proper Notch
- Plan the Notch*
- Cut the Notch

* a V-Cut

So...

- to get the job done properly there's the need to:
- know **what is needed** to perform the task
- **plan according to the environment**
- get **the right tools**
- have **the right skills**
- **combine all** the previous points **efficiently** and **evaluate** the progress of you actions **periodically**

In summary, we need

- A **Process** [What to do…]
- A **Model and Method** [How to do it…]
- A **Tool** [The appropriate support to do it efficiently]

Process

set of **activities,** typically grouped into phases, **with a particular logic sequence**, **executed in an systematic and uniformed way**, accomplished by people with **well established roles**, so that from a set of input, a set of outputs are generated!

Process

1. A
1.1 B
1.1.1 C
1.1.2 D
1.2 E
2. F
3. G
4.1 H
5 I

- define what is needed ("WHAT"), without specifying how ("HOW")
- encloses a structure with different aggregation levels allowing the analysis and definition in different detail levels
- and supporting different decision needs

Method

- set of techniques to execute a certain task
- it specifies **how a task is executed**
- it encloses itself a process

Tool

- an instrument whenever applied to a specific method, increases the efficiency of a task
- facilitates the execution of the tasks (“HOW”)

Methodology

- collection of processes, methods and tools. All interrelated
- a set o guidelines to apply specific processes, methods and tools to specific problems

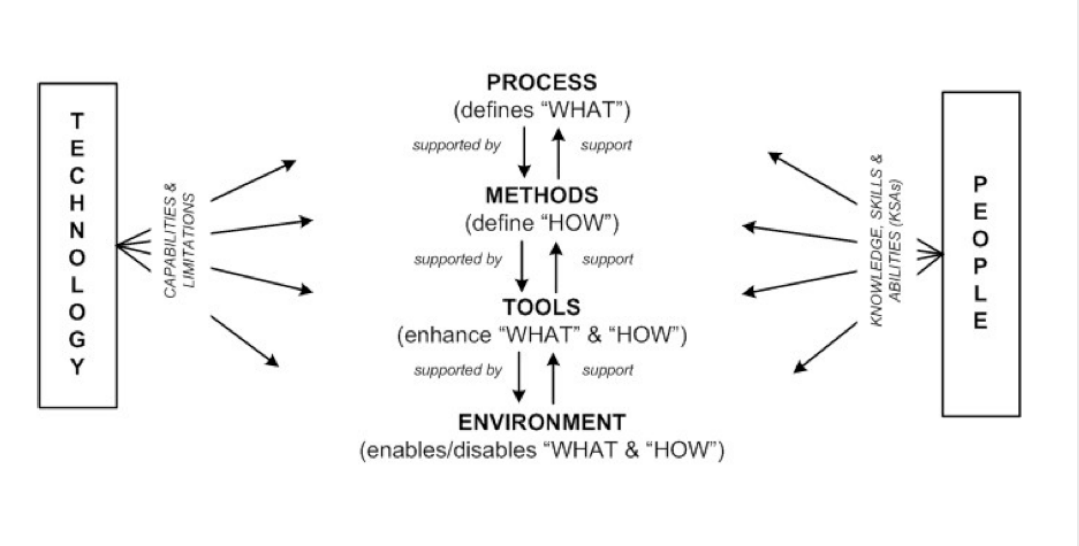
Environment

- it comprises the mean, external objects, conditions of factors that influence the actions on an object, person or group
- the conditions can be:
  - social
  - cultural
  - physics
  - organisational
  - functional

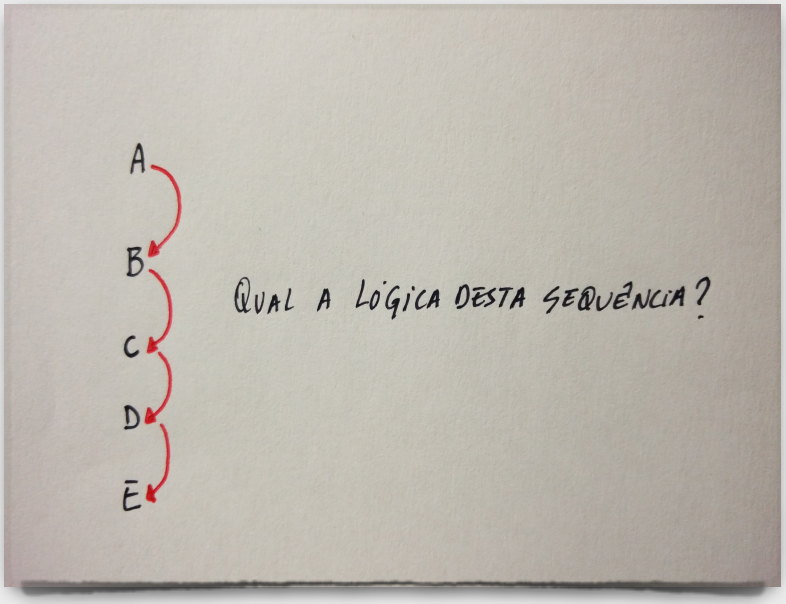
Environment

- the environment of a project should support the uso of certain tools and methods in that project
- the environment may add some restrictions to the “WHAT” and “HOW”

Process, method, tool and environment

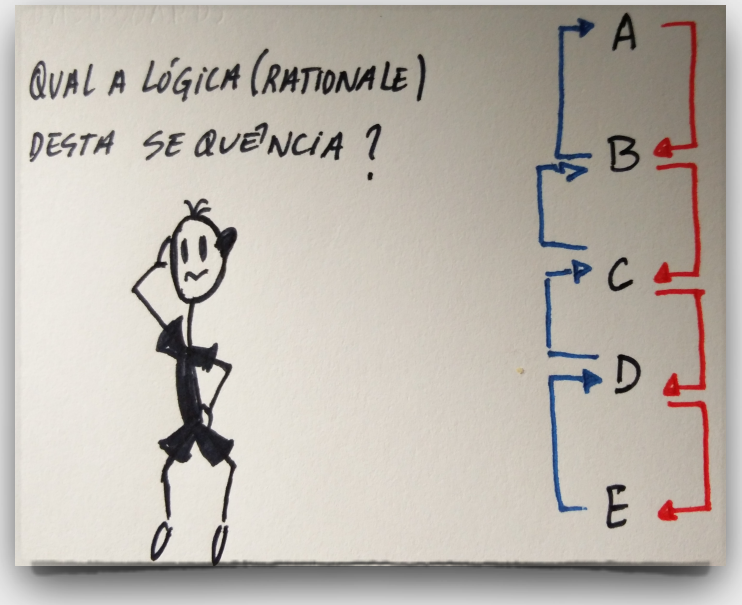


Ordering a sequence of tasks



set of **activities,** typically grouped into phases, **with a particular logic sequence**, **executed in an systematic and uniformed way**, accomplished by people with **well established roles**, so that from a set of input, a set of outputs are generated

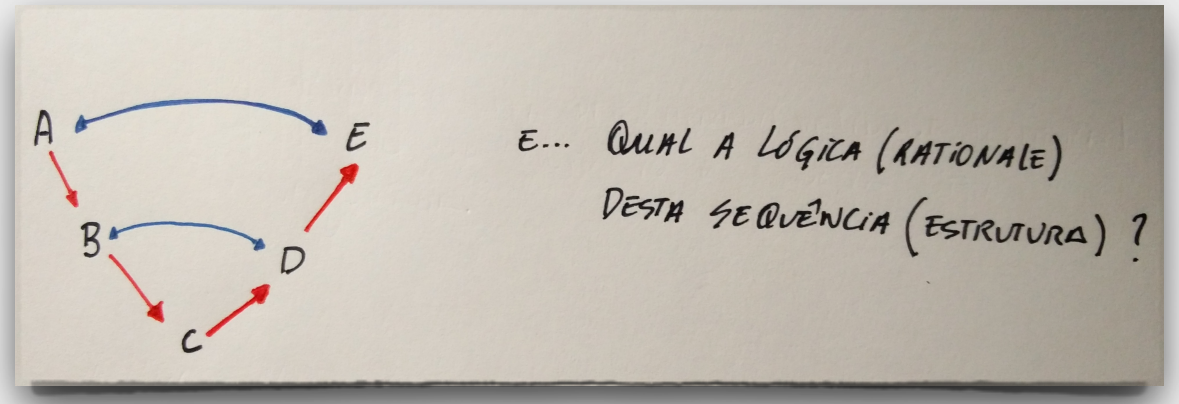
Setting the **logic** of a sequence of tasks



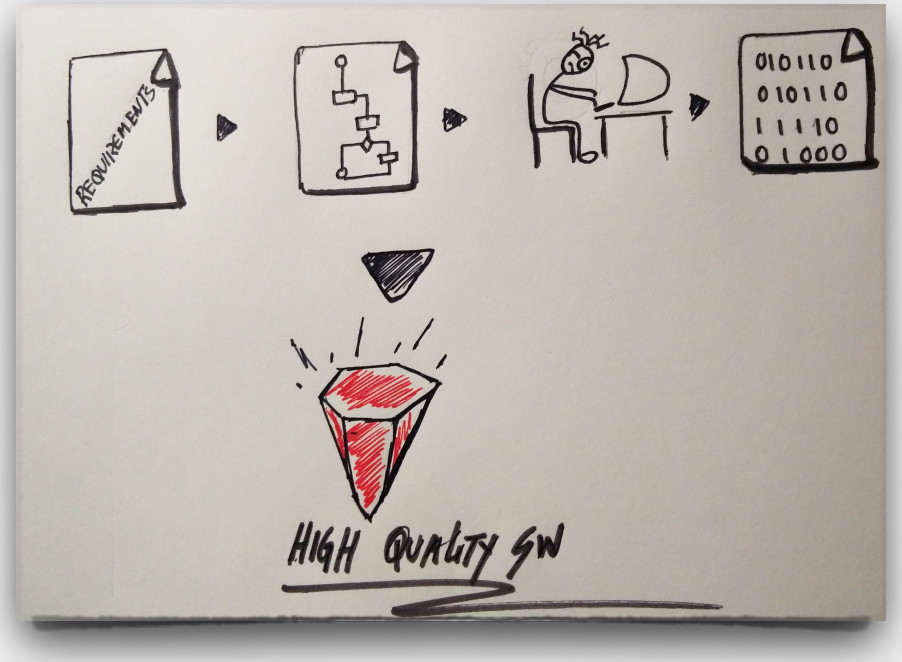
define the **rationale! ***

*a set of **reasons** or a logical basis for a course of action or belief.

Setting the **logic** of a sequence of tasks



Towards software quality…



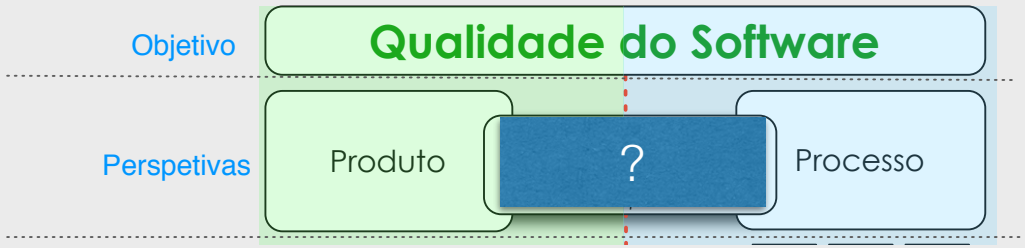
What?
How?
With Whom?
Supported by which tools?
Under which circumstances?

…can we produce high quality software?

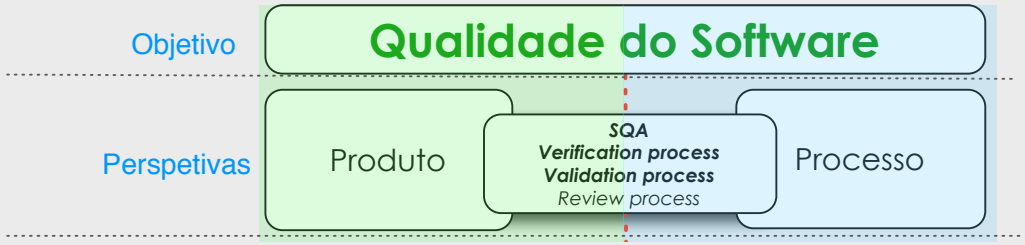
Roadmap for Software Quality

Objetivo — **Qualidade do Software**

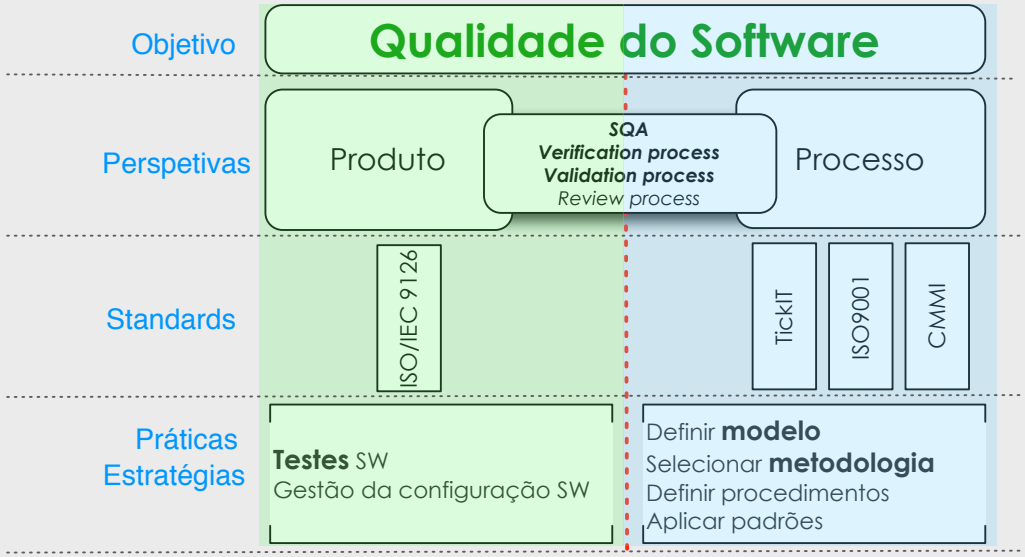
Roadmap for Software Quality



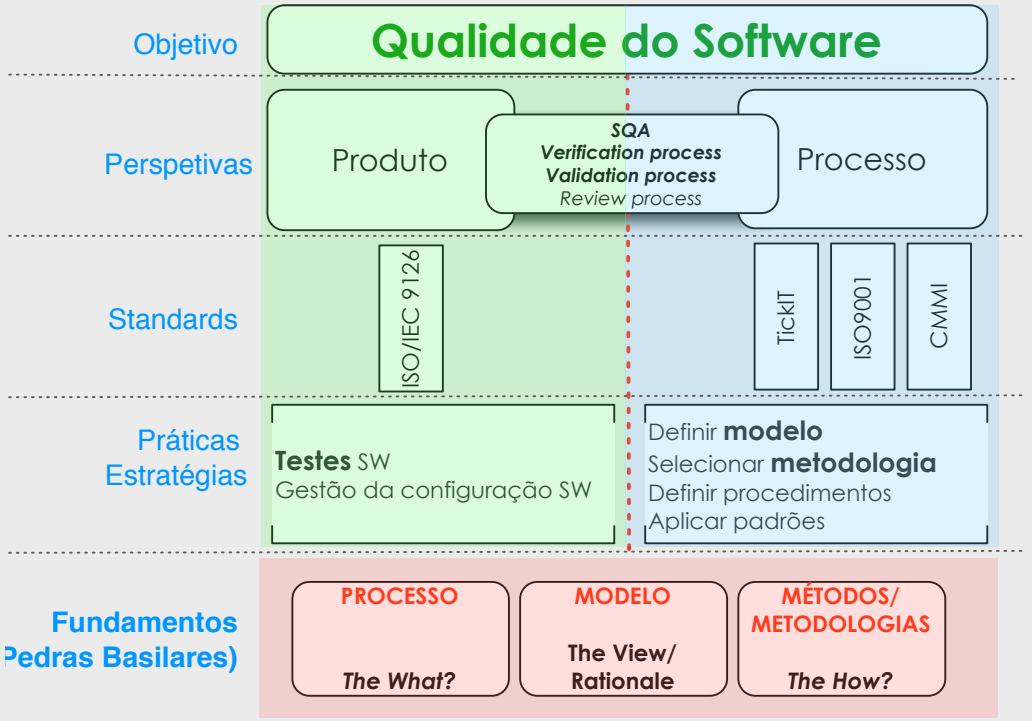
Roadmap for Software Quality



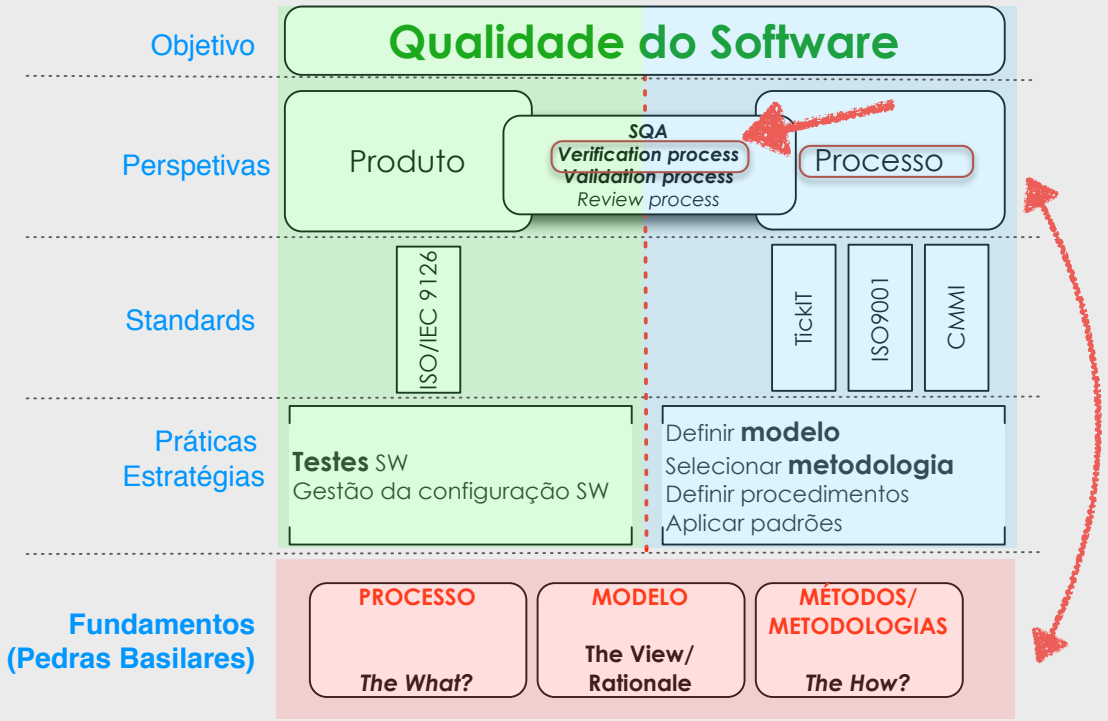
Roadmap for Software Quality



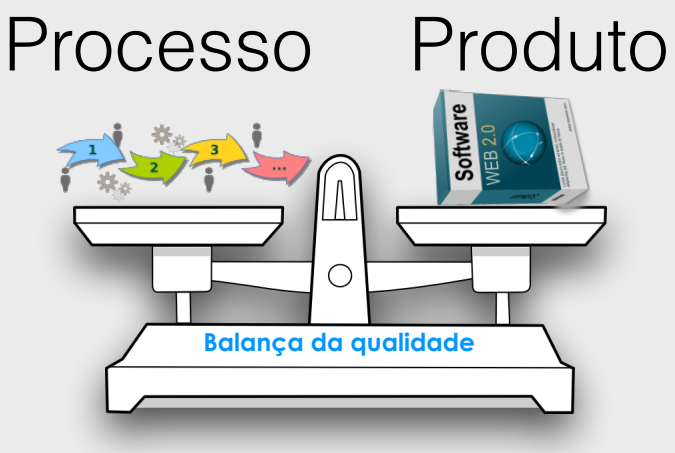
Roadmap for Software Quality



Roadmap for Software Quality



Perspetiva (Vistas) sobre a qualidade de SW

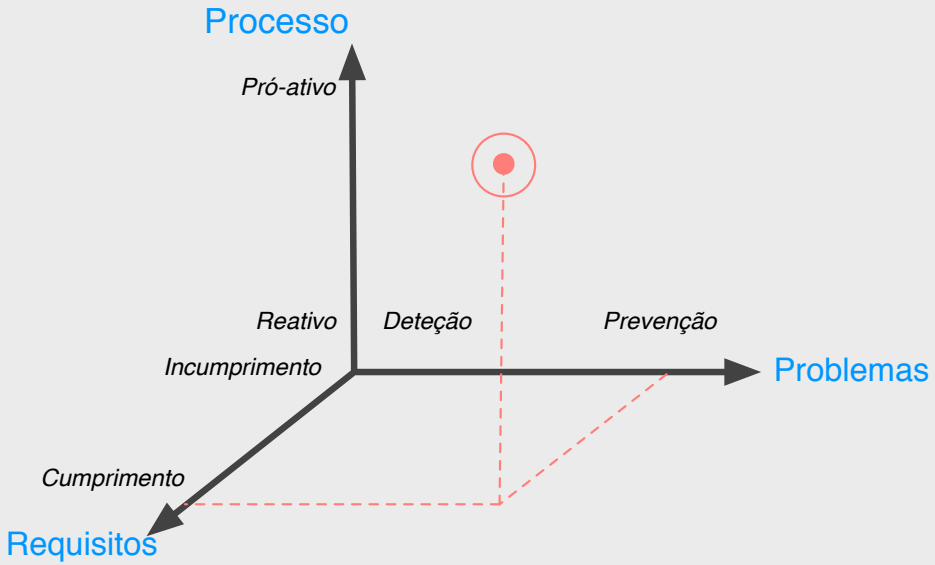


- A qualidade do processo e a qualidade do produto estão interligados. Não devemos dissociar o processo do produto.

- No entanto, o foco poderá ser maior numa ou noutra componente

Desenvolvimento de Software com Qualidade

- Como Desenvolver software de elevada qualidade?



Factos (I)

- Quase **1/2 das empresas portuguesas têm processos de teste de software**, mas **apenas em 17% dos casos se encontram certificados**.

- "A grande maioria das empresas não contabiliza o custo da não-qualidade", afirma o responsável de Research & Consulting da IDC Portugal.

- **"A actividade de teste e de garantia de qualidade do software pode ajudar, e muito, a aumentar o nível de rentabilidade dos projectos,** garantir a sua qualidade e o seu correcto funcionamento", realça o vice-presidente da ComTest.PT

Factos (II)

- As **empresas estão a alocar cerca de um quarto do seu orçamento de TI para testes e garantia de qualidade** das suas aplicações.

- À **medida que as empresas avançam nos processos de transformação digital, a fiabilidade das aplicações torna-se cada vez mais crítica** para o desenvolvimento das suas operações e da reputação dos seus negócios, pelo que "os testes e a garantia de qualidade das aplicações (Testing & Quality Assurance ou T&QA) estão a ganhar um protagonismo crescente.

Factos (III)

- O **World Quality Report** revela também que **são em número cada vez maior as empresas que procuram profissionais especializados em testes e conhecedores da sua área de atividade, ou do setor onde operam.** Quase dois terços dos responsáveis inquiridos (63%) afirmaram que é fundamental que os seus colaboradores da área de testes conheçam as atividades das suas empresas, porque a garantia de qualidade tem que estar cada vez mais alinhada com as prioridades estratégicas dos seus negócios".

Factos (VI)

- **QA functions are becoming structurally more mature**
  the number of organisations with a fully functional TCOE increased from 6% in 2012 to 19% in 2013

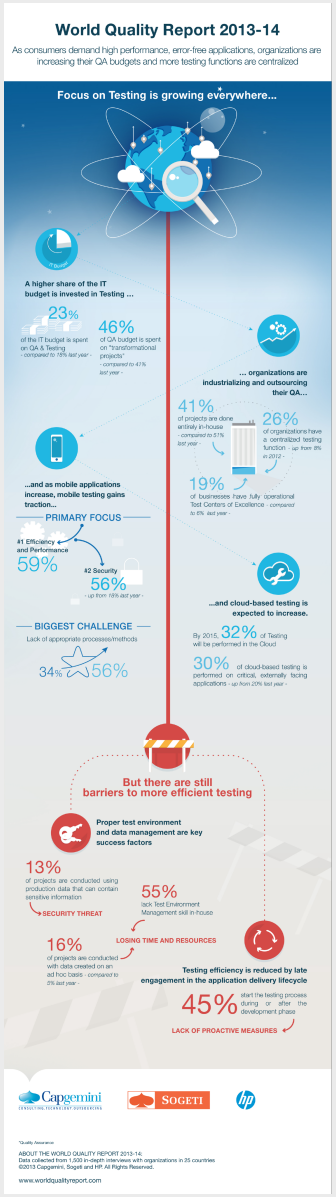
- **Organizations continue to increase the proportion of their IT budgets for Testing**
  from 18% in 2012 to 23% in 2013

- **QA teams are still engaged too late in the application development lifecycle, which contributes to the increase of testing's share within IT budgets to manage operational and quality inefficiencies**

- **Rise of Mobile Testing as a key discipline**
  55% organisations now carry it out compared to 31% last year

- **Organisations face challenges in managing test environments and creating test data**

  16% of testing projects are executed with data created 'as we go', up from 5% in 2012


World Quality Report 2013-14
As consumers demand high performance, error-free applications, organizations are increasing their QA budgets and more testing functions are centralized
Focus on Testing is growing everywhere...
A higher share of the IT budget is invested in Testing ...
23%
of the IT budget is spent on QA & Testing - compared to 18% last year -
46%
of QA budget is spent on "transformational projects" - compared to 41% last year -
... organizations are industrializing and outsourcing their QA...
41%
of projects are done entirely in-house - compared to 51% last year -
26%
of organizations have a centralized testing function - up from 8% in 2012 -
19%
of businesses have fully operational Test Centers of Excellence - compared to 6% last year -
...and as mobile applications increase, mobile testing gains traction...
PRIMARY FOCUS
#1 Efficiency and Performance
59%
#2 Security
56%
- up from 48% last year -
BIGGEST CHALLENGE
Lack of appropriate processes/methods
34%
56%
...and cloud-based testing is expected to increase.
By 2015, 32% of Testing will be performed in the Cloud
30% of cloud-based testing is performed on critical, externally facing applications - up from 20% last year -
But there are still barriers to more efficient testing
Proper test environment and data management are key success factors
13%
of projects are conducted using production data that can contain sensitive information
SECURITY THREAT
55%
lack Test Environment Management skill in-house
16%
of projects are conducted with data created on an ad hoc basis - compared to 5% last year -
LOSING TIME AND RESOURCES
Testing efficiency is reduced by late engagement in the application delivery lifecycle
45%
start the testing process during or after the development phase
LACK OF PROACTIVE MEASURES
Capgemini
SOGETI
hp
ABOUT THE WORLD QUALITY REPORT 2013-14:
Data collected from 1,500 in-depth interviews with organizations in 25 countries
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www.worldqualityreport.com

A reter!

- Qualidade de Software ***implica*** Qualidade do Processo + Qualidade do Produto
- Não há qualidade de software sem engenharia
- Uma visão holística (abrangente) sobre a qualidade de software ***implica***
  - compreender o processo de desenvolvimento de SW
  - conhecer os principais modelos de desenvolvimento e o contexto de aplicação dos mesmos
  - conhecer metodologias de desenvolvimento de SW e aplicar as suas práticas, quer relacionados com o processo, quer associadas ao produto