

Classification des exigences Une lecture critique

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Gil ? C'est qui ?

- 1982 – 1988 Computer Science Studies EPFL
 - 1988 – 1997 SW Engineer, SW Project Leader, Logitech CH,USA
 - 1998 – 2003 Doctoral studies EPFL
 - 1997 – Present Senior Researcher, EPFL
 - 2008 – Present Knowledge Manager, Senior Manager, Itecor
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- Research, teaching, consulting in:
 - Business Analysis
 - Requirements Engineering
 - Enterprise Architecture
 - Knowledge Management
 - Change Management

Requirements Classification

BABOK V3

Requirements Classification Schema

For the purposes of the *BABOK® Guide*, the following classification schema describes requirements:

- **Business requirements:** statements of goals, objectives, and outcomes that describe why a change has been initiated. They can apply to the whole of an enterprise, a business area, or a specific initiative.
- **Stakeholder requirements:** describe the needs of stakeholders that must be met in order to achieve the business requirements. They may serve as a bridge between business and solution requirements.
- **Solution requirements:** describe the capabilities and qualities of a solution that meets the stakeholder requirements. They provide the appropriate level of detail to allow for the development and implementation of the solution. Solution requirements can be divided into two sub-categories:
 - **functional requirements:** describe the capabilities that a solution must have in terms of the behaviour and information that the solution will manage, and
 - **non-functional requirements or quality of service requirements:** do not relate directly to the behaviour of functionality of the solution, but rather describe conditions under which a solution must remain effective or qualities that a solution must have.
- **Transition requirements:** describe the capabilities that the solution must have and the conditions the solution must meet to facilitate transition from the current state to the future state, but which are not needed once the change is complete. They are differentiated from other requirements types because they are of a temporary nature. Transition requirements address topics such as data conversion, training, and business continuity.

Source: A Guide to The Business Analysis Body of Knowledge® V3, p. 16

IREB

We distinguish between three kinds of requirements:

- ▶ *Functional requirements* concern a result or behavior that shall be provided by a function of a system. This includes requirements for data or the interaction of a system with its environment.
- ▶ *Quality requirements* pertain to quality concerns that are not covered by functional requirements — for example, performance, availability, security, or reliability.
- ▶ *Constraints* are requirements that limit the solution space beyond what is necessary to meet the given functional requirements and quality requirements.

Note that dealing with requirements for projects or development processes is outside the scope of this handbook.

Source: Handbook for the CPRE Certified Professional for Requirements Engineering, Foundation Level - Version 1.0.0, p. 8

What is Business Analysis

- Business Analysis (BA)

“the practice of enabling change in an enterprise by defining needs and recommending solutions that deliver value to stakeholders.

Business analysis enables an enterprise to articulate needs and the rationale for change, and to design and describe solutions that can deliver value.”

Source: A Guide to The Business Analysis Body of Knowledge® V3

Solutions?
Any solution?

- Requirements Engineering (RE)

“The systematic and disciplined approach to the specification and management of requirements with the goal of understanding the stakeholders’ desires and needs and minimizing the risk of delivering a system that does not meet these desires and needs.”

Source: A Glossary of Requirements Engineering Terminology 2.0.0

A system?
What system?
Why a system?

Requirement Classification: BABOK

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If a requirement represents a need, why do they use goals, objectives and outcomes in this definition?

Who needs business requirements? Stakeholder requirements are enough because the business is also a stakeholder

Project related stuff
Are these really requirements?

Data conversion?
Very IT specific

Reminder: A requirement is a usable representation of a need

Reminder: A stakeholder is a group or individual with a relationship, to the change, the need, or the solution

Source: A Guide to The Business Analysis Body of Knowledge® V3, p. 16

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Does the solution need something?

Why only two?
Why these two?

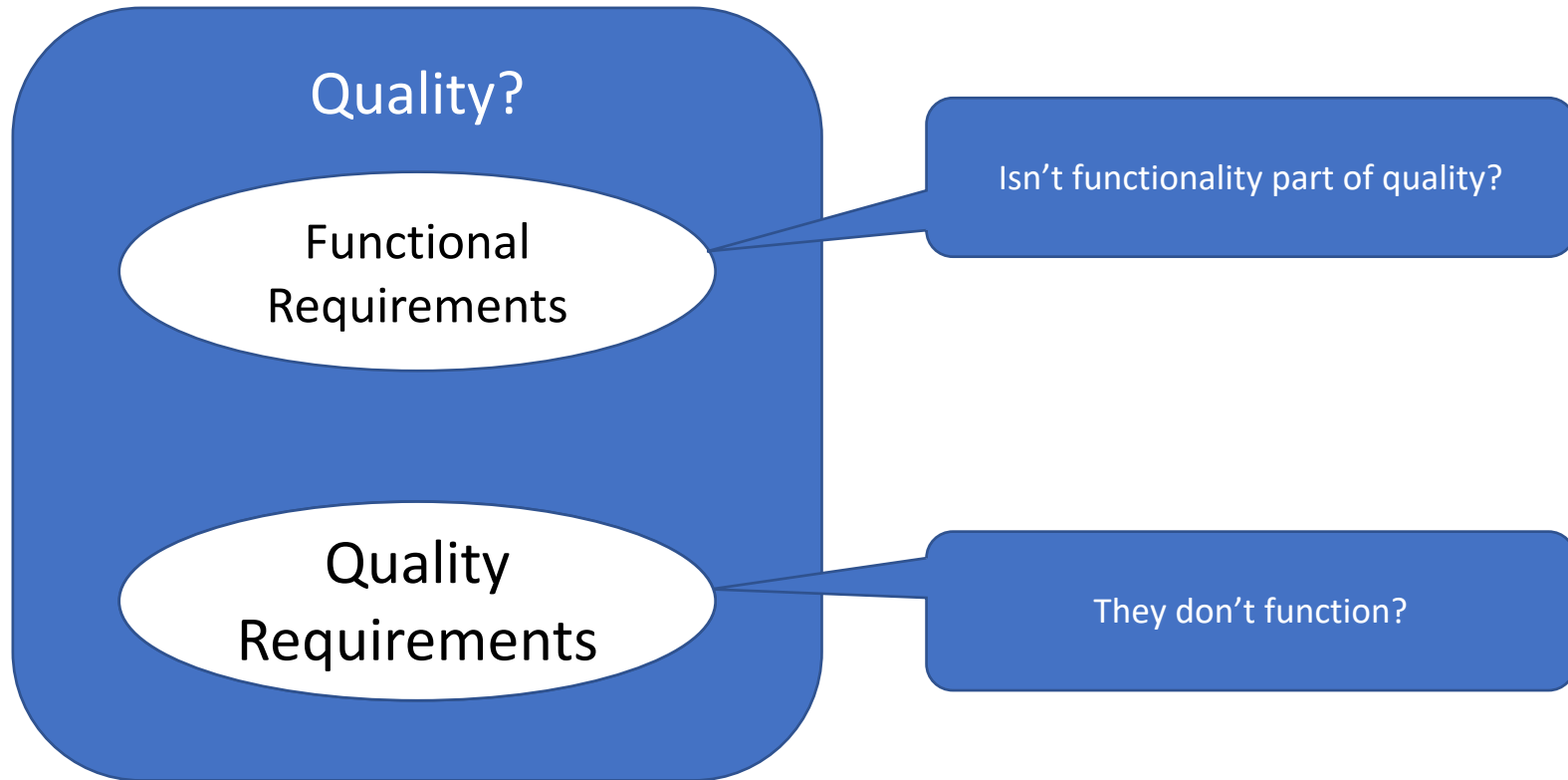
Do not relate directly?
What does that mean?
Already in the name (non-functional)

Behaviour of functionality?
What does that mean?

What qualities?
Already in the name (quality of service)

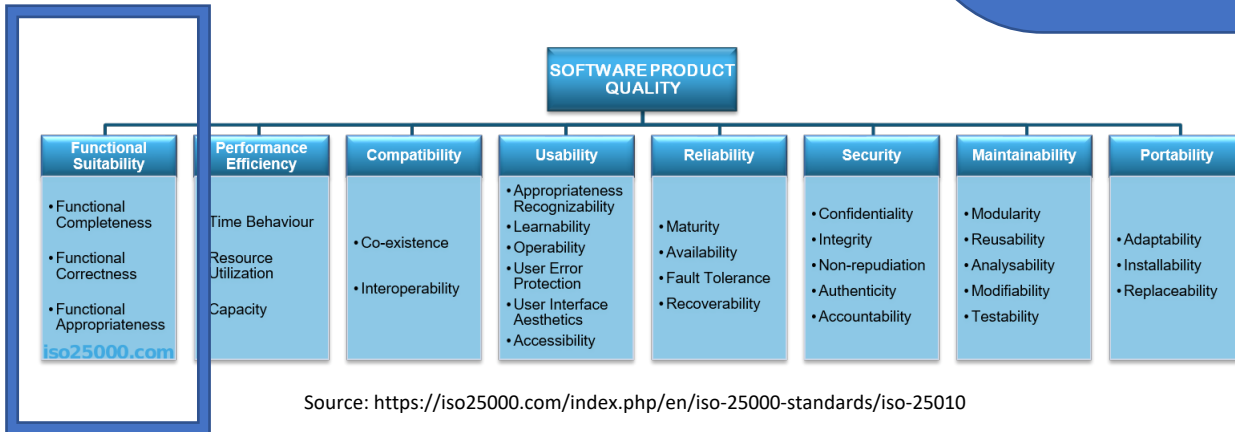
Source: A Guide to The Business Analysis Body of Knowledge® V3, p. 16

What is Quality?



Functionality?

ISO 25000



Source: <https://iso25000.com/index.php/en/iso-25000-standards/iso-25010>

The Plot Thickens

“Distinguishing between functional requirements, quality requirements, and constraints **is not always straightforward**”

One proven way to differentiate between them is to ask for the concern that a requirement addresses

- if the concern is about **required results, behavior, or interactions**, we have a functional requirement.
- If it is a **quality concern** that is not covered by the functional requirements, we have a **quality requirement**.
- If the concern is about restricting the solution space but is **neither a functional nor a quality requirement**, we have a constraint.

The popular rule “What the system shall do → functional requirement vs. how the system shall do it → quality requirement” **frequently leads to misclassifications**, particularly when requirements are specified in great detail or when quality requirements are very important”

Source: Handbook for the CPRE Certified Professional for Requirements Engineering, Foundation Level - Version 1.0.0, p. 8, emphasis added

Why is this classification a problem?

“Consider a system that processes the measurement data produced by the detector of a high-energy particle accelerator. Such detectors produce enormous quantities of data in real time.

If you ask a physicist “What shall the system do?”, one of the first answers would probably be that **the system must be able to cope with the volume of data produced.**

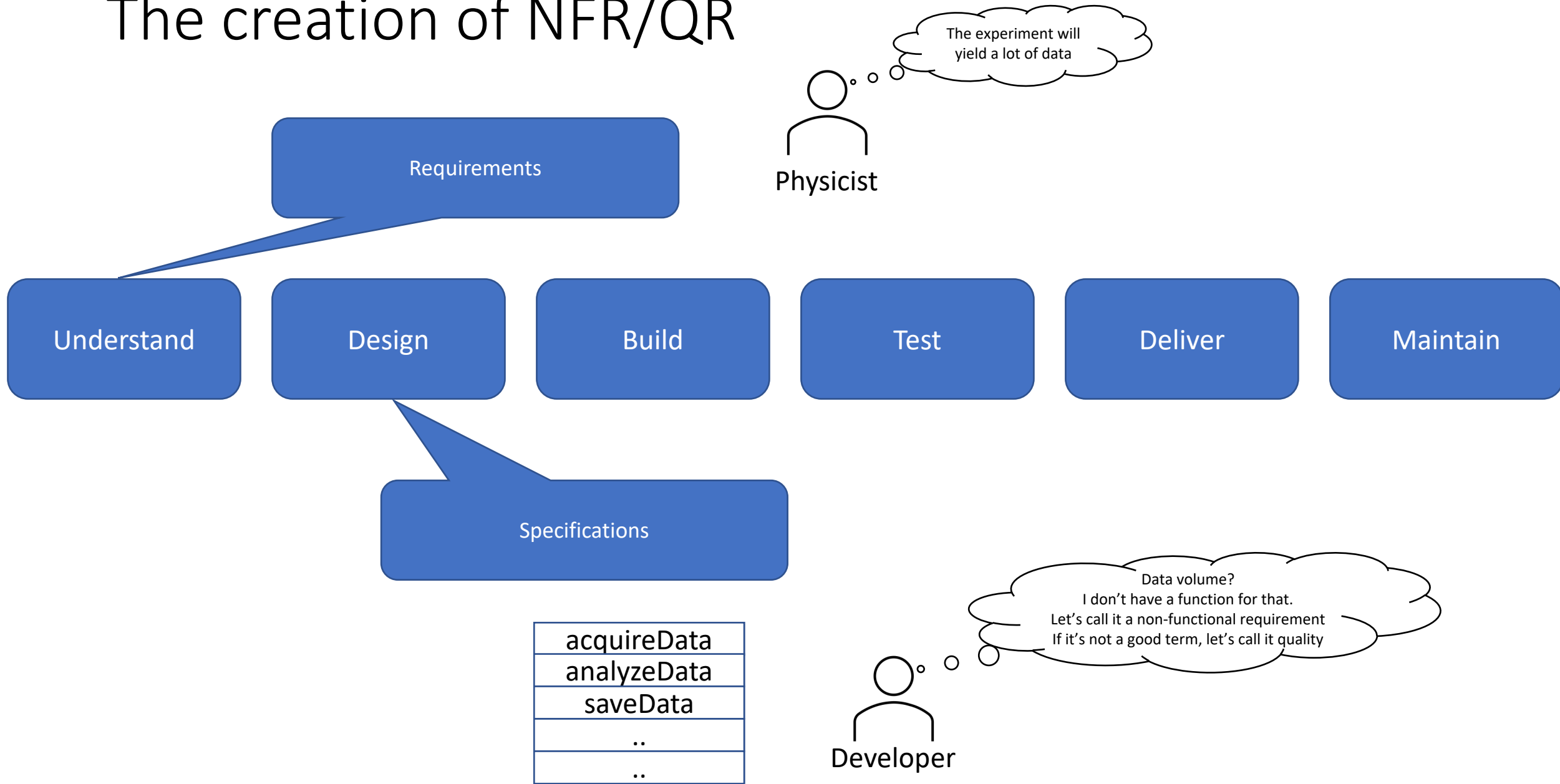
However, requirements concerning data volume or processing speed are quality requirements [..] and not functional requirements.”

Source: Handbook for the CPRE Certified Professional for Requirements Engineering, Foundation Level - Version 1.0.0, p. 8, emphasis added

Does the physicist care?

Is this not “required results, behavior, or interactions?”

The creation of NFR/QR



Return to Basics

“(1) All the terminology used in requirements engineering should be grounded in the reality of the environment for which a machine is to be built.

(2) It is not necessary or desirable to describe (however abstractly) the machine to be built. Rather, the environment is described in two ways: as it would be without or in spite of the machine and as we hope it will become because of the machine.

Requirements are supposed to describe what the desired machine does, not how it does it. More precisely, requirements are supposed to describe what is observable at the interface between the environment and the machine, and nothing else about the machine. To say anything else about the machine is regarded as implementation bias.”

Source: Zave, P. and Jackson, M., Four dark corners of requirements engineering, ACM Transactions on Software Engineering and Methodology, Volume 6, Issue 1, Jan. 1997, pp 1–30, emphasis added

From Requirements to Design

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These are not requirements
They are design specifications

Conclusions

- By calling too many things “requirement” we’re blurring their essential property: stakeholder needs/wants
- The designers may need the distinction between functional and non-functional requirements, but not the other stakeholders
- Quality criteria are very important in order to not forget important requirements
- A quality model, such as ISO 25000 for (IT) systems and software, is a very useful list of criteria and it includes functional suitability
- The classification, both in the BABOK and the CPRE, are dependent on an IT perspective. It is confusing and limits the application of BA/RE concepts to other fields.