Requirements and Business Analysis
Chapter 2 - Requirements: General principles

v.2024.05.17

https://requirements.university

About the slides' author

- Professor at Toulouse University
  - Teaching modeling, requirements and DevOps
- Member of the CNRS-IRIT Laboratory
  - Model-Based Systems Engineering
- Leader of the companion book

https:/bit.ly/jmbruel
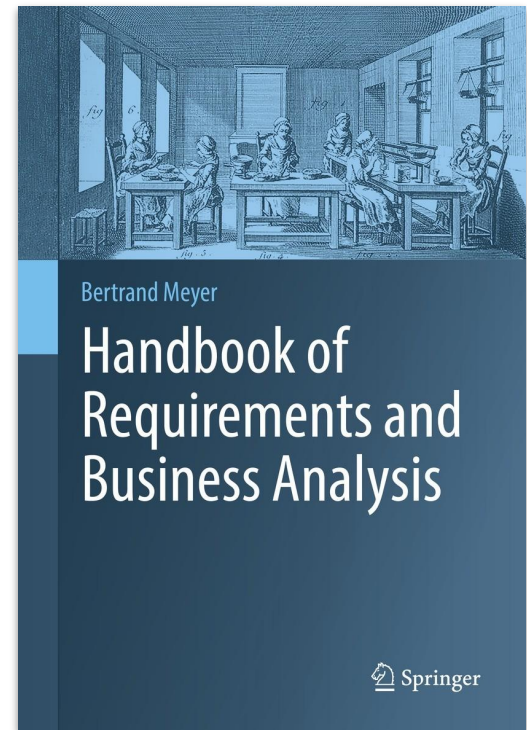
Get the slides (pdf)

Disclaimer

This material is based on this book, by Bertrand Meyer.

But it only reflects the point of view of its author.

It is part of additional materials developed

and available at https://requirements.university

https://se.inf.ethz.ch/requirements/

Outline

1. What role for requirements?
2. Human aspects
3. Requirements elicitation and production
4. Requirements management
5. Requirements quality
6. Other principles

Outline

The need for requirements

Requirements Principle

*"Any **successful** project must involve a requirements **effort**."*

The role of requirements

Requirements Questions Principle

*"Take advantage of the requirements process to ensure that **important questions** about the Project, Environment, Goals and System are raised and **addressed at the proper time.**"*

The nature of requirements

Requirements Nature Principle

*"Requirements are **software**."*

The evolution of requirements

Requirements Evolution Principle

*"Requirements are a **living asset** of any project, subject to evolution. They must be **adapted** and kept **up to date** throughout the project."*

The place of requirements in the project lifecycle

Requirements Elaboration Principle

*"Produce an **initial version** of the requirements at the start of the project.*

***Update** and **extend** these requirements throughout the project."*

The form of requirements

Requirements Repository Principle

*"Make requirements and all elements that provide requirements-relevant information **available** through a repository.*

*Treat the **repository** as one of the **key resources** of the project; keep it up to date."*

Outcomes of requirements

Minimum Requirements Outcome Principle

*"The requirements effort must **always** produce the following elements.*

*For the **Goals**: Key business objectives (**G.1**), Key expected benefits (**G.3**), Key stakeholders (**G.7**).*

*For the **System**: Key functions (**S.2**), Overall division into clusters (**S.1**).*

*For the **Environment**: Key external constraints on the system (**E.3**).*

*For the **Project**: As essential guidance for the rest of the project: main tasks (**P.4**), Also as part of this guidance: main milestones (**P.3**)."*

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Outcomes of requirements

Project (P)

P.1 Roles and personnel
P.2 Imposed technical choices
P.3 Schedule and milestones*
P.4 Tasks and deliverables*
P.5 Required technology elements
P.6 Risk and mitigation analysis
P.7 Requirements process and report

Goals (G)

G.1 Context and overall objective*
G.2 Current situation
G.3 Expected benefits*
G.4 Functionality overview
G.5 High-level usage scenarios
G.6 Limitations and exclusions
G.7 Stakeholders and requirements sources*

Environment (E)

E.1 Glossary
E.2 Components
E.3 Constraints*
E.4 Assumptions
E.5 Effects
E.6 Invariants

System (S)

S.1 Components*
S.2 Functionality*
S.3 Interfaces
S.4 Detailed usage scenarios
S.5 Prioritization
S.6 Verification and acceptance criteria

* These chapters should not be empty
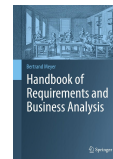(following the Minimum Requirements Outcome Principle)

Outline

Stakeholders

Stakeholders Principle

*"Identify all stakeholders whose non-involvement might imperil the project; **involve them**."*

Authors

Requirements Leadership Principle

"For all but small projects, requirements engineers (or business analysts) should lead the process of producing requirements."

Outline

Separation of concerns

Environment Principle

*"**Distinguish between** system and environment properties."*

Outline

1. What role for requirements?

2. Human aspects

3. Requirements elicitation and production

4. Requirements management

5. Requirements quality

6. Other principles

Traceability

Traceability Principle

"Throughout the project:

*(T1) **Record all the consequences** of the requirements on the project and system.*

*(T2) **Record the requirements sources** of project and system elements."*

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Outline

Quality

Requirements Effort Principle

*"Devote **enough effort** to guarantee requirements quality, but **not so much** as to detract from other tasks of the software development process."*

Outline

More to come...

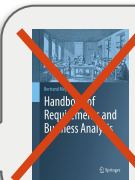18 other principles are present in the book and will be introduced when needed.

Good principles implementation

In the following slides we provide examples of concrete implementation of some principles, to illustrate not only their benefits, but their practicality.

Principles can be implemented (and hence verified)

Here is an example of concrete implementation of one principle, using BDD (Behavior-Driven Dev.).

```
4    #———————————————————————————
5    # language: en
6    Feature: Minimum Requirements Outcome Principle
7        The requirements effort must always produce the following elements.
8
9    Scenario: The Project book must have P3 P4 chapters
10       Given The Project book
11       Then P3 chapter must not be empty
12       And P4 chapter must not be empty
13
14   Scenario: The Environment book must have E3 chapter
15       Given The Environment book
16       Then E3 chapter must not be empty
17
18   Scenario: The Goals book must have G1 G3 G7 chapters
19       Given The Goals book
20       Then G1 chapter must not be empty
21       And G3 chapter must not be empty
22       And G7 chapter must not be empty
23
24   Scenario: The System book must have S1 S2 chapters
```

Minimum Requirements Outcome

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Discussions time

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