
Customer-driven product development by requirement engineering

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Zühlke

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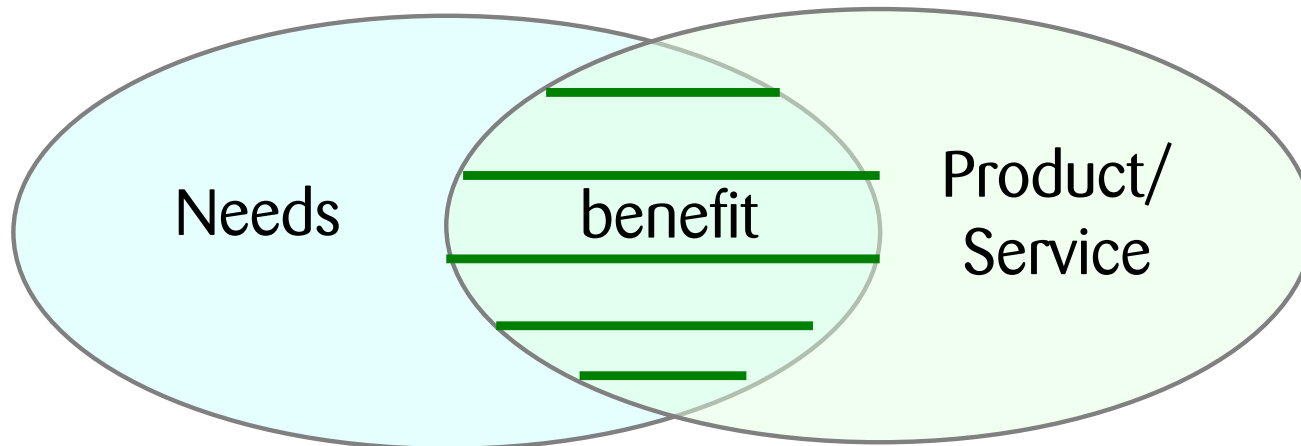
- Introduction, overview and fundamentals
- Eliciting requirements
- Documenting requirements
- Checking and reconciling requirements
- Managing requirements

What's the goal

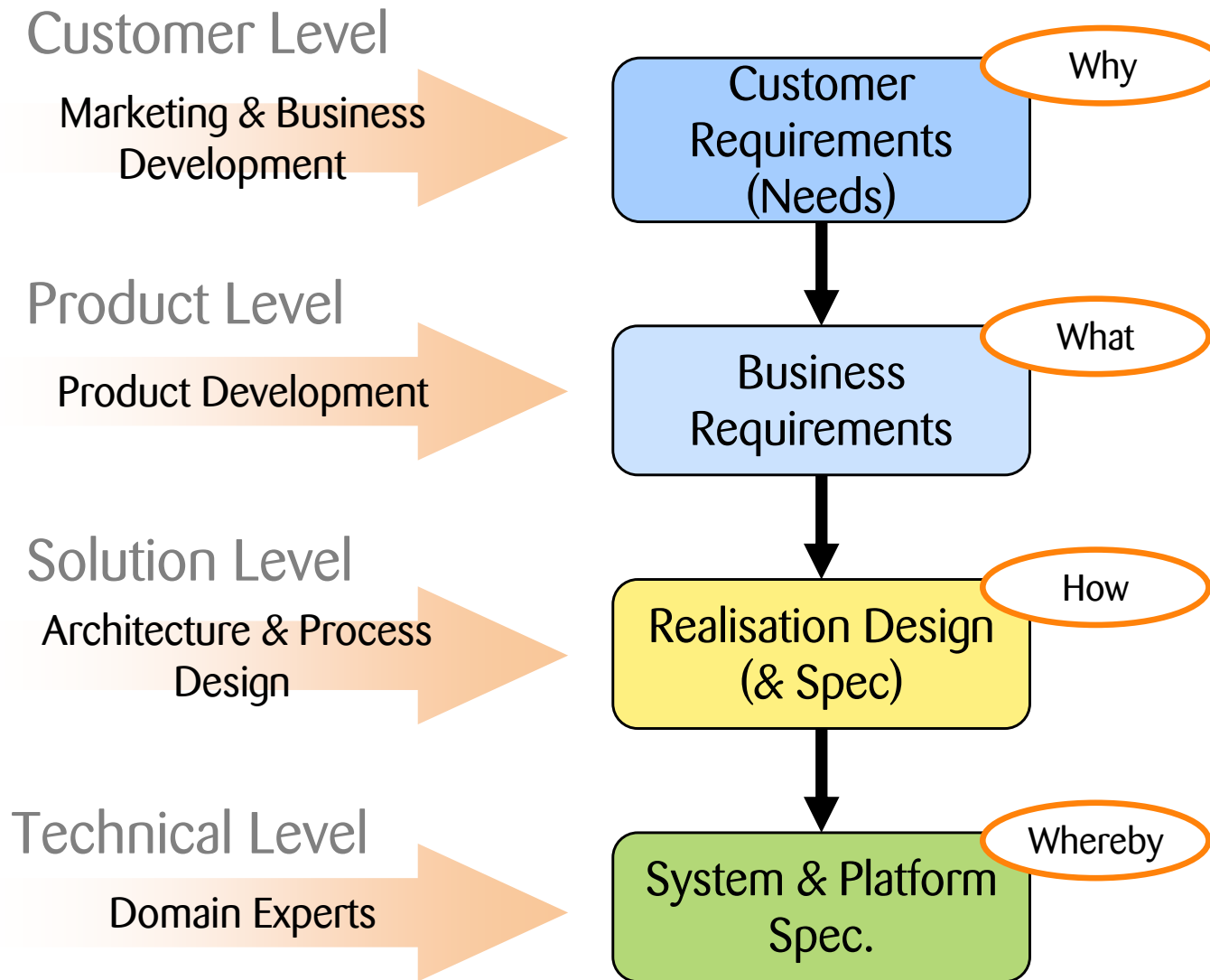


Benefit instead of reactive power!

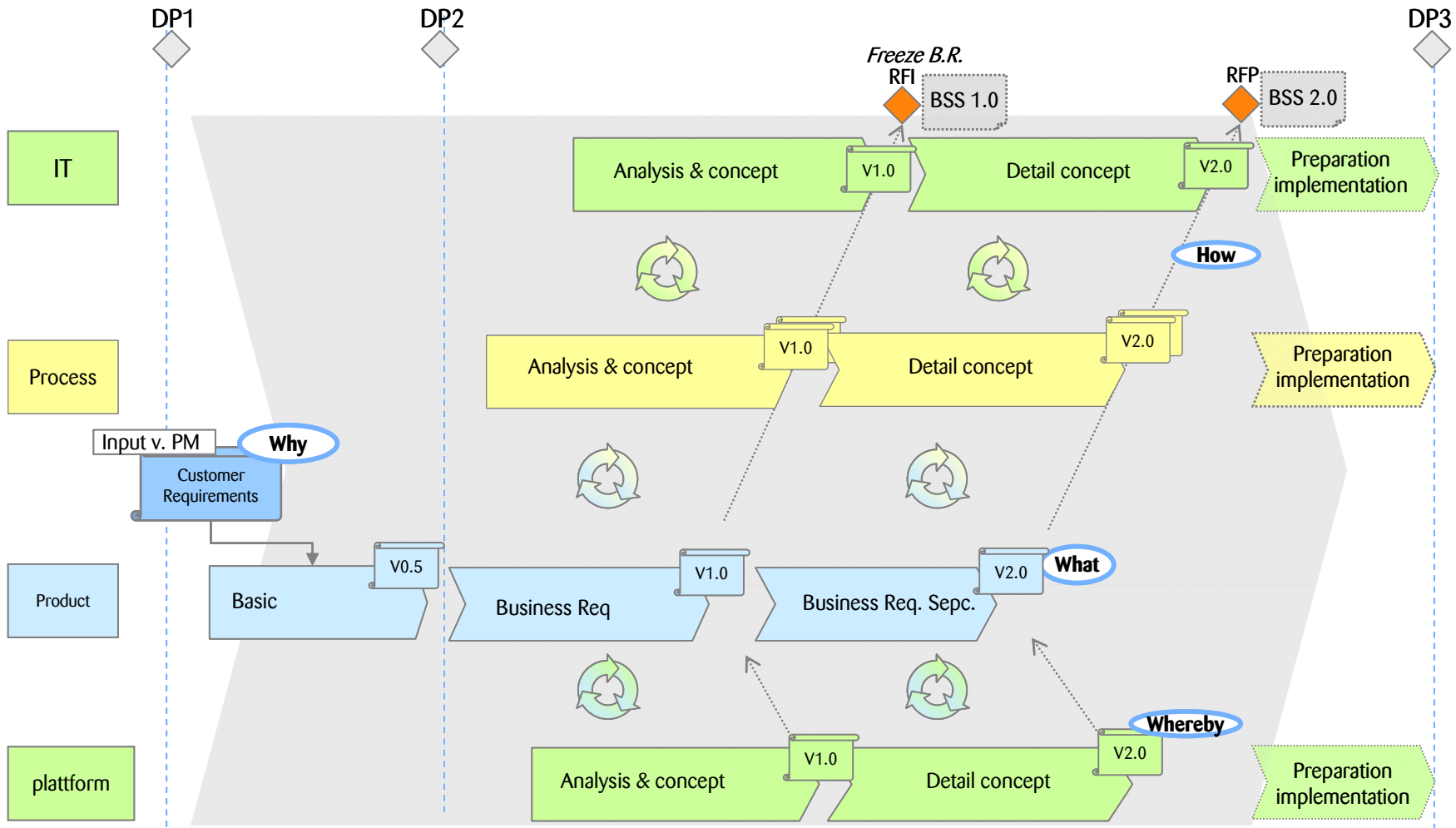
„An achievement reaches a use then only if it satisfies a need. Each part of an achievement, which parts of needs passes, is only partly useful “



Typical RE-flow



RE modell from view of Business



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Symptoms of inadequate RE

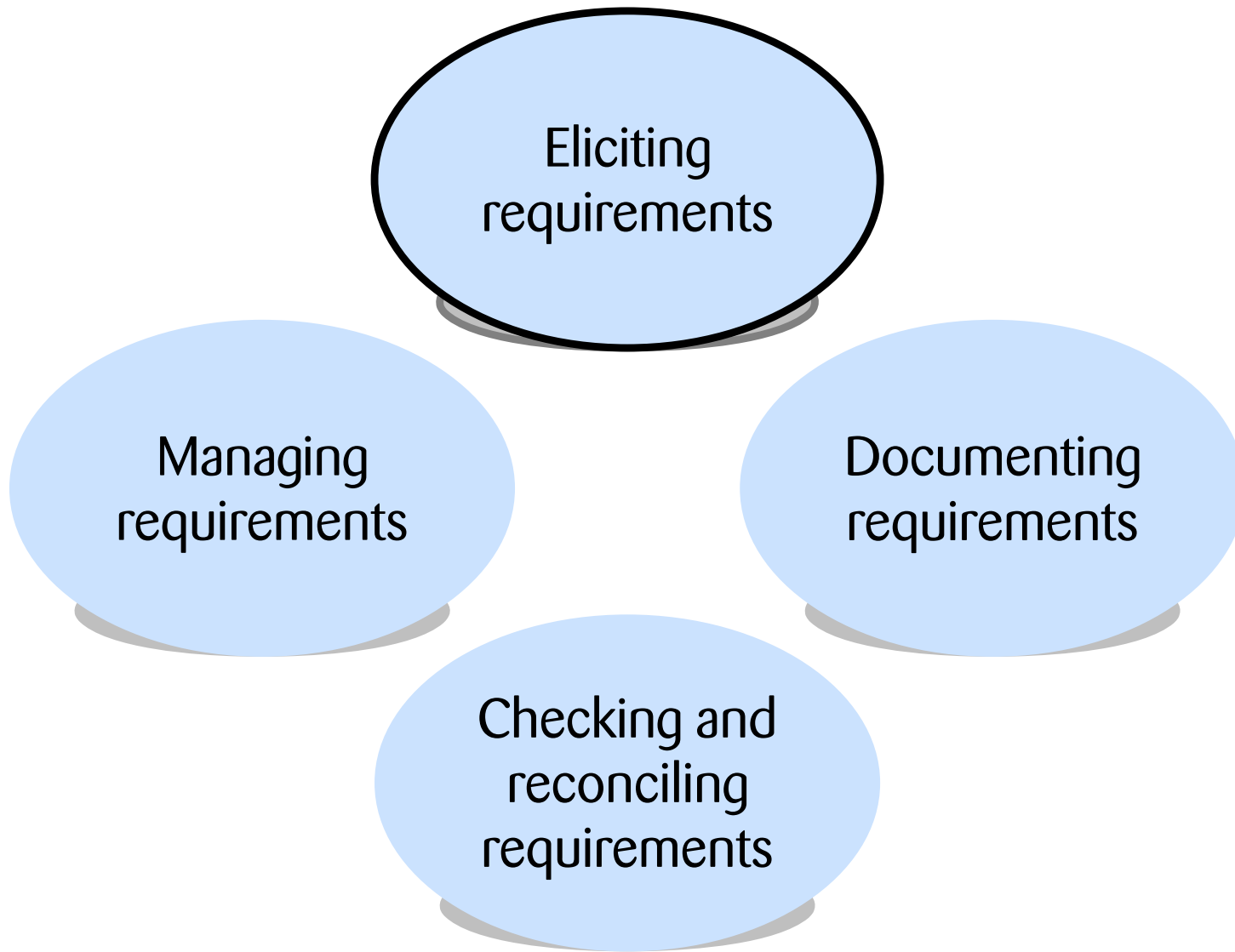


Good RE is important since many problems in software and system development have their origin in this discipline. Correcting them later results in high costs.

Typical symptoms on inadequate RE are unclear and missing requirements.

- The wrong assumption by stakeholders that many things are self-explaining and need no explicit treatment
- Communications problems based on different know-how and experience
- Project pressure exerted by contractors asking for early delivery of productive systems

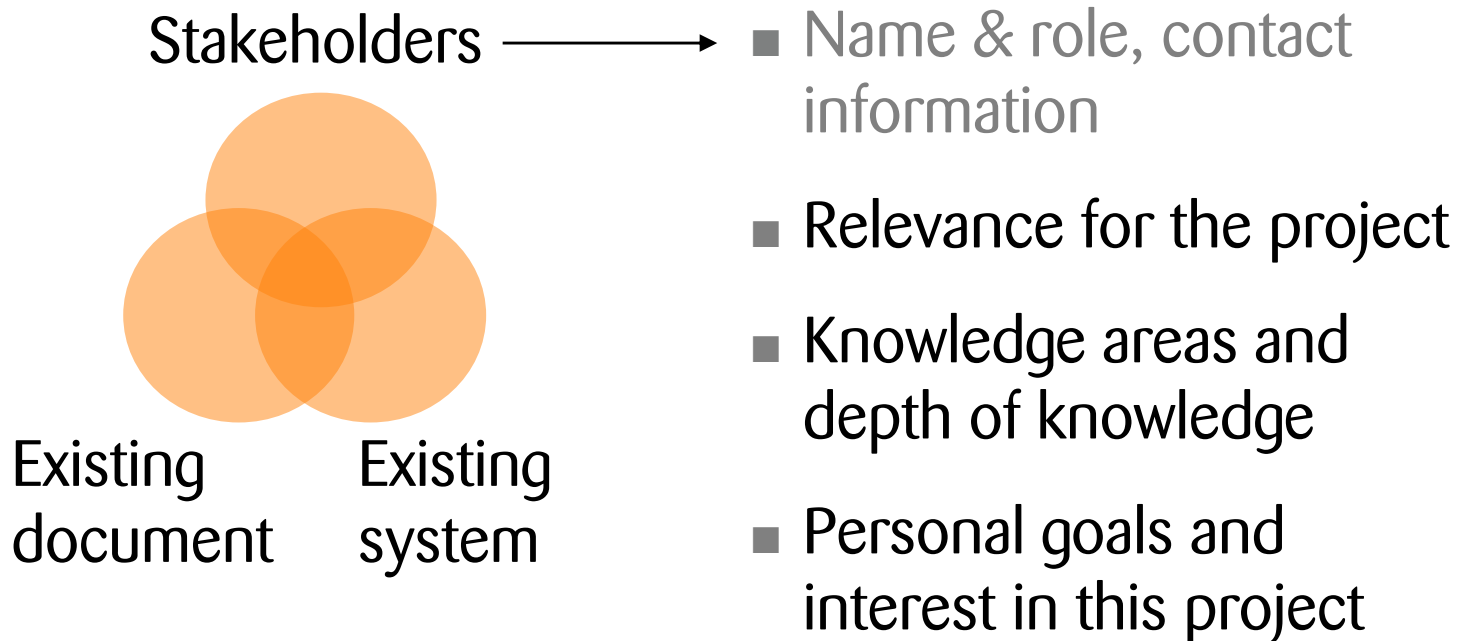
Major activities within RE



Sources of requirements

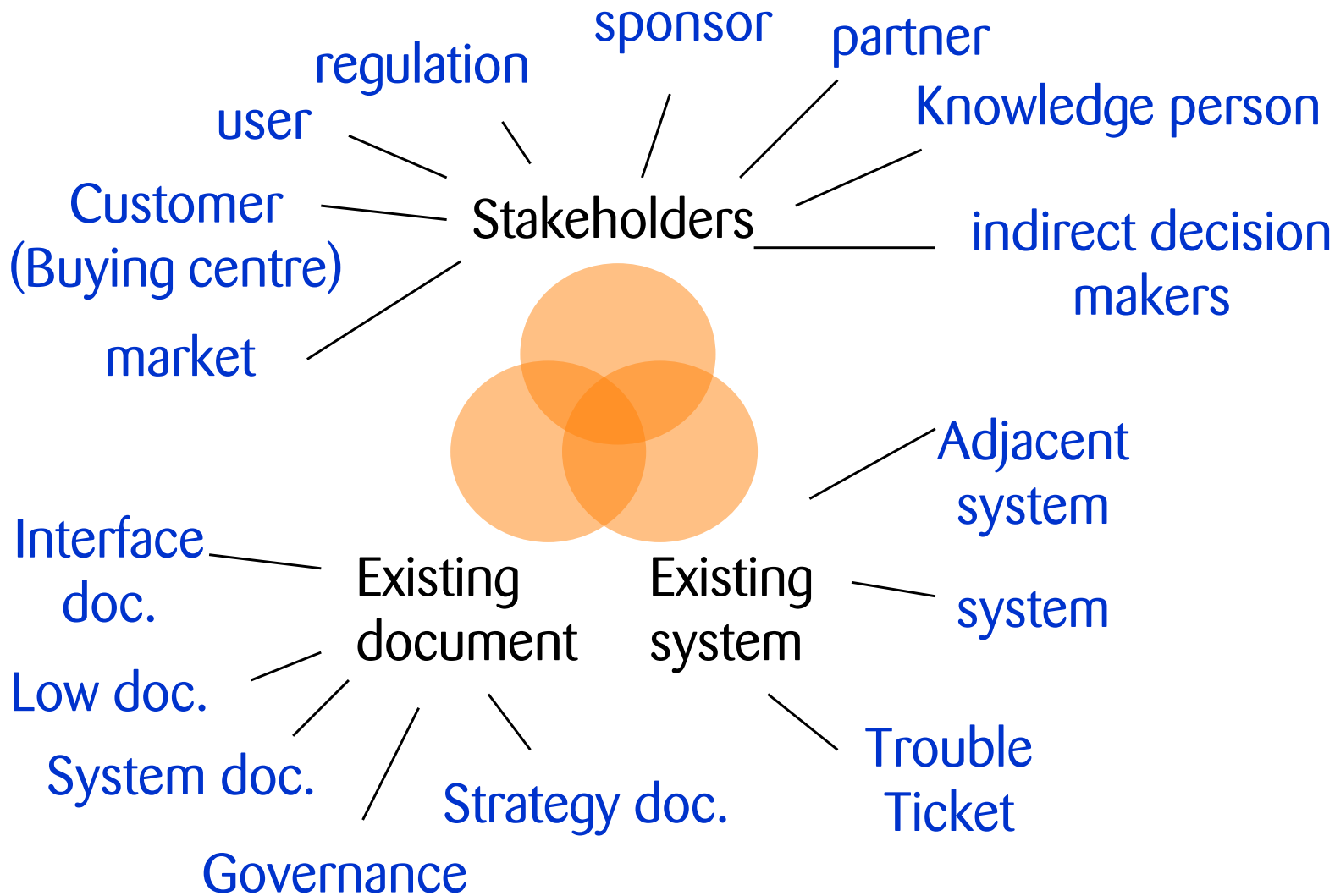


It is the job of a requirements Engineer to collect goals and detailed requirements from all the sources mentioned above.



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Sources of requirements

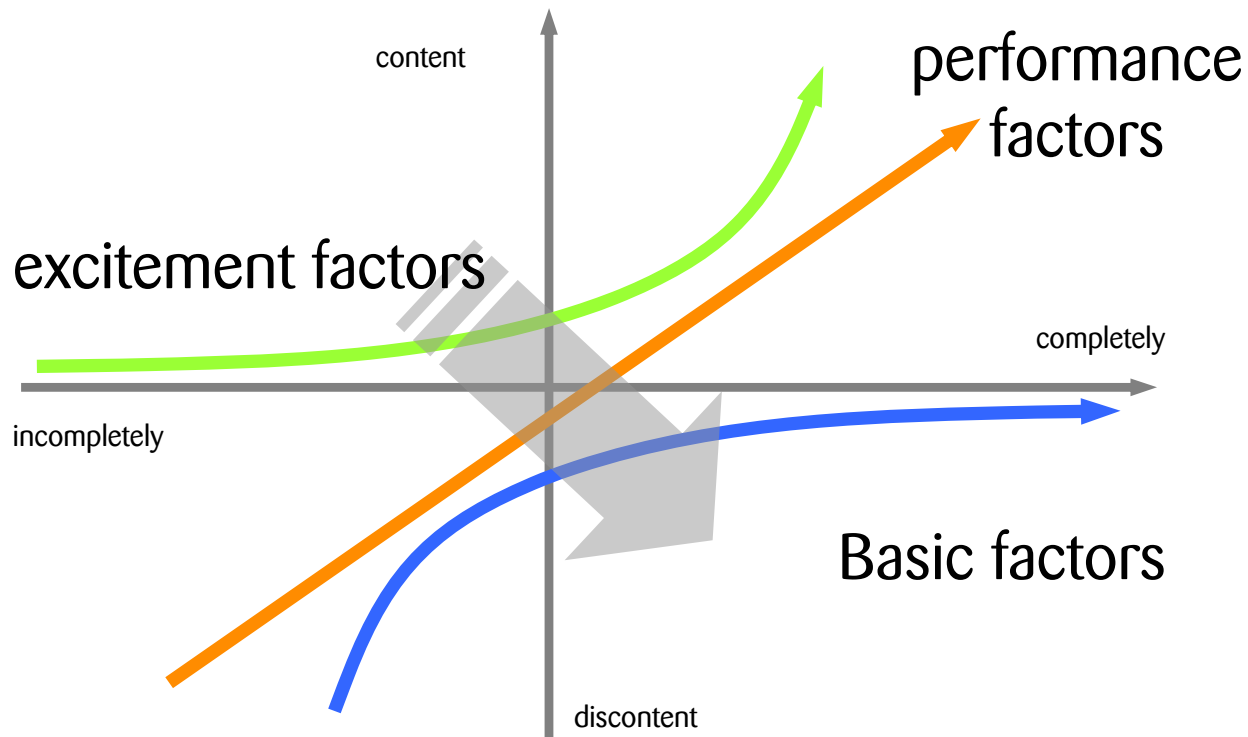


Categorization of requirements

Kano model



During elicitation of requirements it is important to know which of the requirements are most important to achieve customer satisfaction.



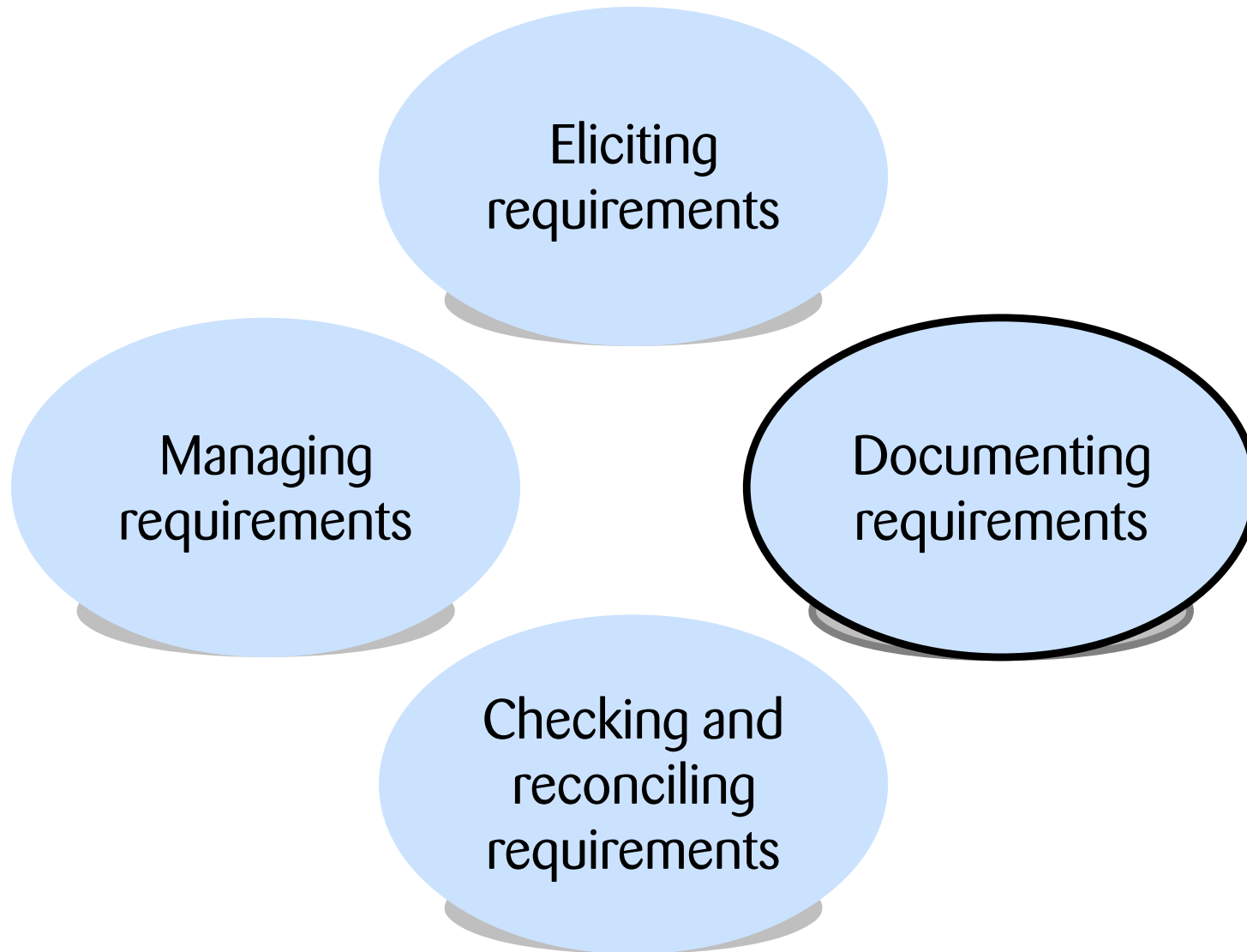
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Different elicitation techniques are needed to find conscious, unconscious and subconscious requirements of stakeholder

- Questioning techniques (interviews, questionnaires)
- Creativity techniques (brainstorming, change of perspective, analogies, creative reframing)
- Document based techniques (system archaeology, reusability of requirements)
- Observation techniques (field observation, apprenticing)
- Supporting techniques (mind mapping, workshops, use case modelling, prototype)

The best result can be achieved by combining different elicitation techniques.

Major activities within RE



Documentation is a key supporting feature for goal oriented communication

- It is necessary to document important information
- Any more or less formal way of capturing requirements is called a documentation technique (from writing various styles to using formal diagrams)
- Many people come in contact with the documentation
- A documentation support is necessary because requirements are long-lasting, they may be legally relevant and they should be accessible to all people

Documentation style alternatives



All requirements be described by using natural languages or modelled using conceptual models.

- Using pure natural languages documents
- Using conceptual requirements models like use case, class models, activity models and state models
- Using a mixed form of requirements documents



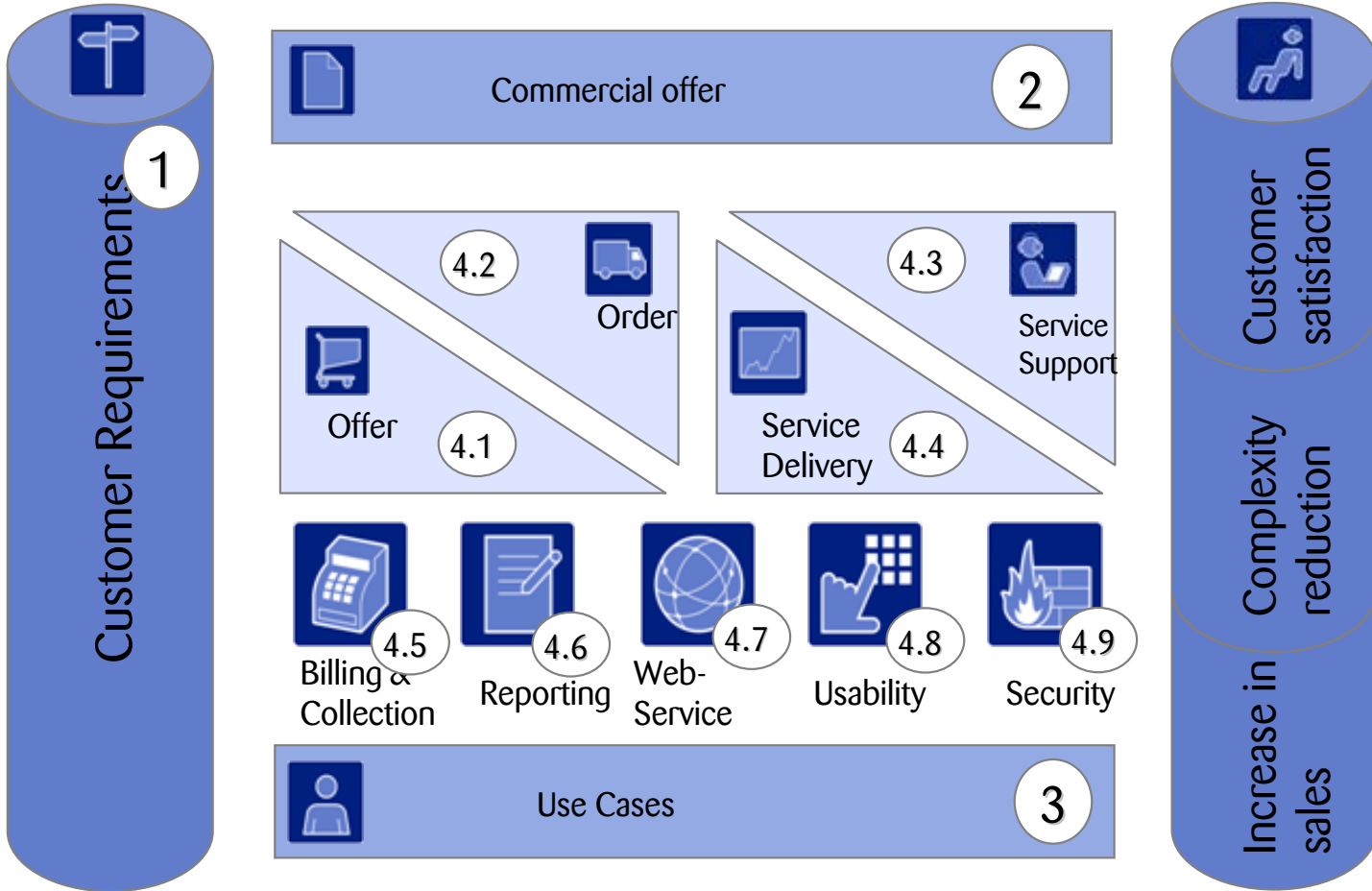
Common reference structures for requirements documents

- IEEE 830–1998 (Reference structure for "Software Requirements Specification")
- IEEE 1233–1998 (Reference structure for "System Requirements Specification")
- Volere...

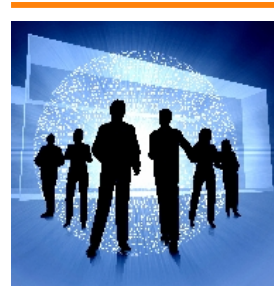


Dokumentenstruk
turen

Example for documentation structure



Business Requirements Doc



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Quality criteria for Requirements Documents



In order to serve as a basic for following activities in the development process a requirements document has to satisfy some quality criteria:

- Unambiguous and consistency
- Clear structure
- Modifiability and extensibility
- Completeness
- Traceability

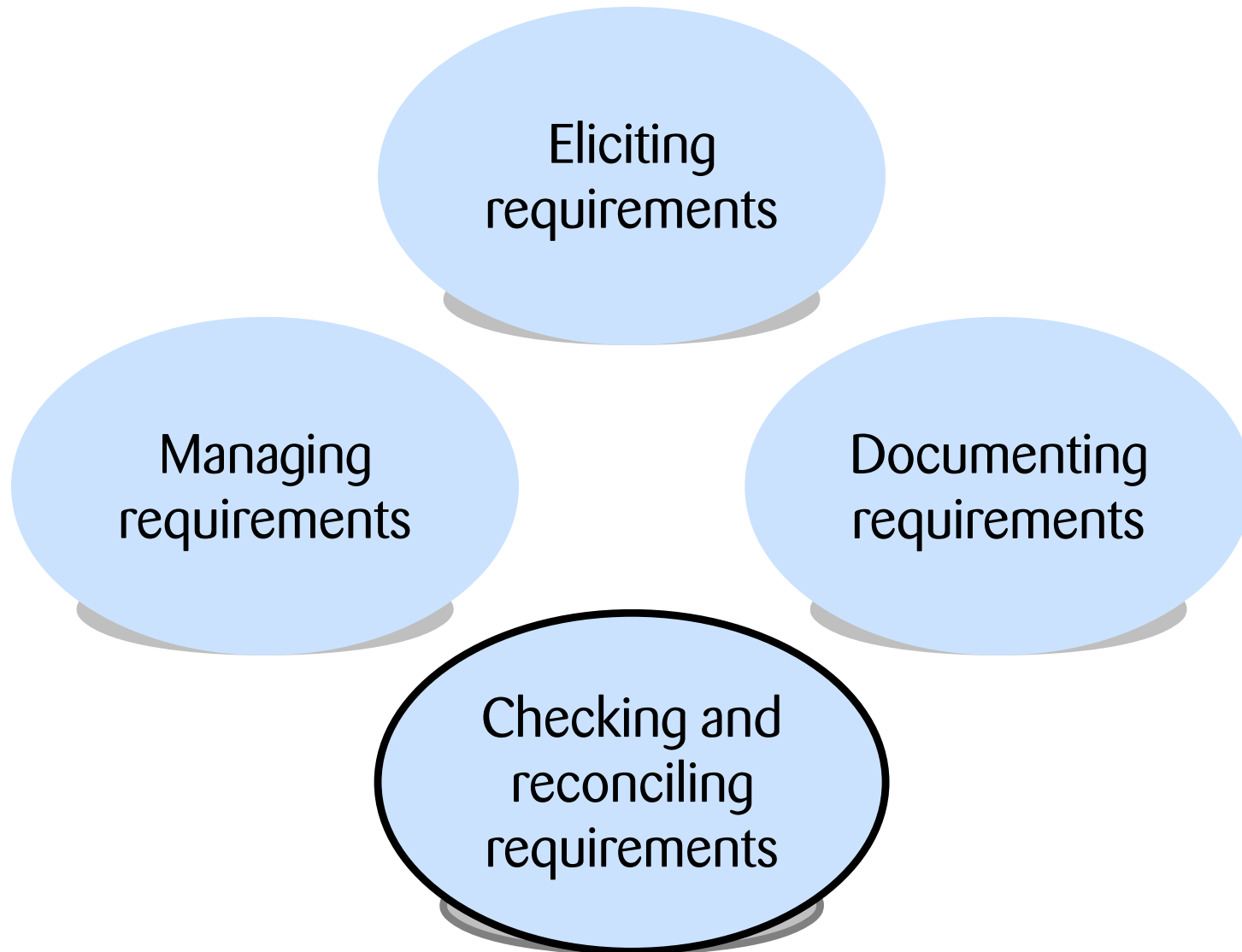
Quality criteria for Requirements



Each individual requirements should conform to requirements' quality criteria.

- Harmonized
- Prioritized
- Unambiguous
- Valid and current
- Correct
- Consistent
- Testable
- Implementable
- Traceable
- Complete
- Understandable

Major activities within RE



Basics for Checking and of Reconciling Conflicting Requirements



Basics for Checking Requirements



The major goal of checking requirements is to find out whether they conform to quality criteria (e.g. correctness or completeness) that have been set beforehand.

Basics of Reconciling Conflicting Requirements



The goal for reconciling conflicts within the requirements is to create a common and agreed understanding of the requirements among all relevant stakeholders.

Principles for Checking Requirements



These principles ensure that during checking a maximum number of errors in the requirements can be identified.

- Involve the right stakeholders
- Separate error discovery and error correction
- Check from different points of view
- Switch between different styles of documentation
- Construct development artefacts based on the requirements
- Repeat checks

Techniques for Checking Requirements

There are several techniques for systematic checks of requirements.

- Expert reports
- Review
- Inspection
- Walkthrough



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Review vs. Walkthrough



Review:

The document is distributed to all stakeholders

Stakeholder collect the defects into a finding-report

The review committee decides on all findings

The finding decisions are communicated to all reviewer

The finding decisions are documented in the delivery object



Walkthrough:

The Walkthrough document is distributed for preparation.

The Walkthrough participant (sub project manager plus guests, max. 6-7 persons) goes into point by point through the document.

Findings are discussed fully directly, decided and documented in the delivery object

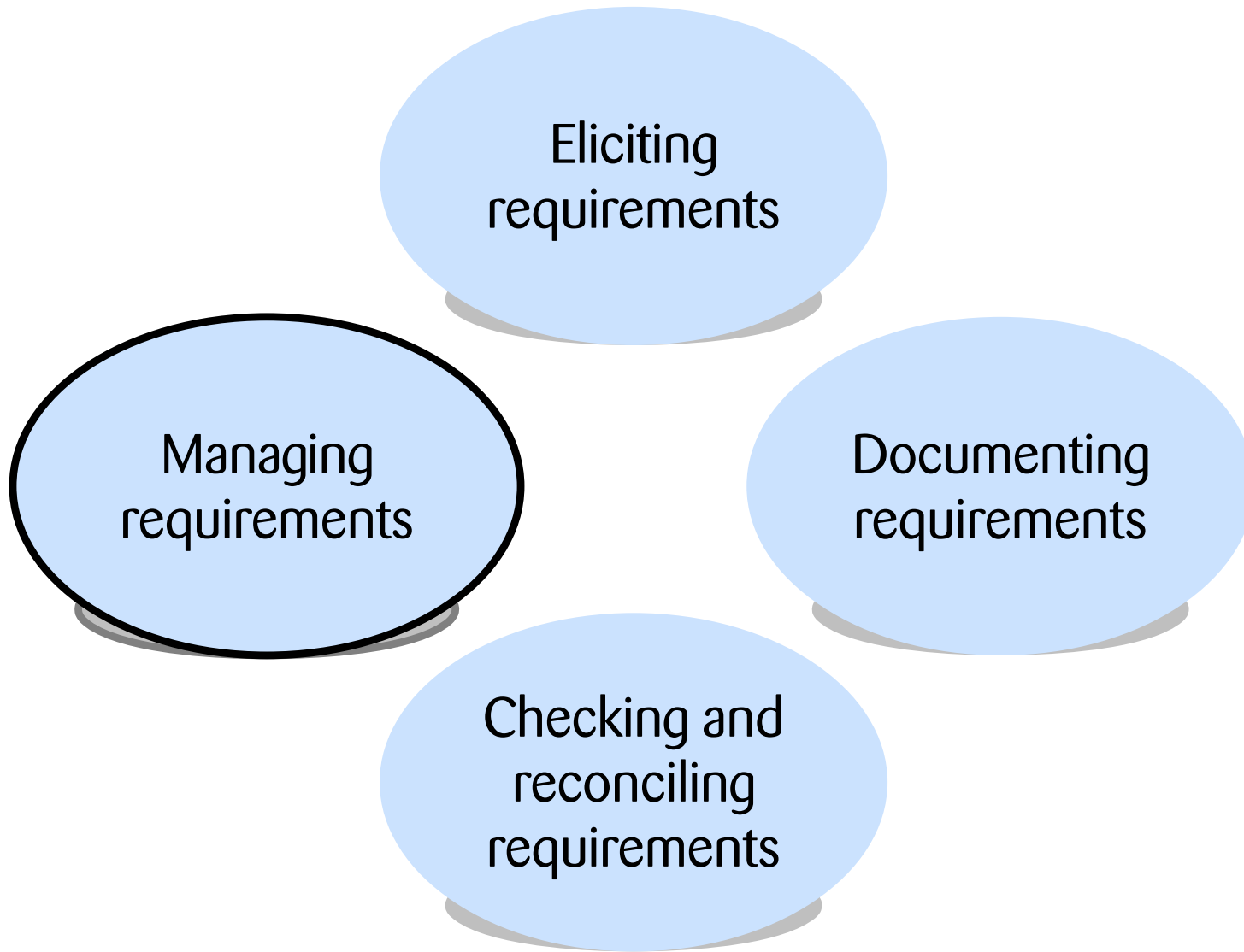
Techniques for Reconciling Conflicting Requirements



Reconciling conflicting requirements aims at achieving a common understanding about the requirements among all relevant stakeholders.

- Conflict identification
- Conflict analysis
- Conflict resolution
- Documentation of conflict resolutions

Major activities within RE



Adding Attributes to Requirements



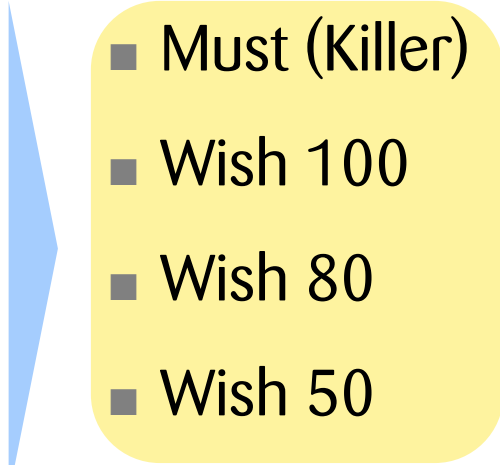
To manage requirements over the whole system life cycle, it is necessary to collect information about the requirements in a structured way.

- Identifier (unique ID)
- Name
- Description
- Source
- Stability
- Criticality
- Priority

Prioritizing Requirements



- Ranking and top-ten selection
- One criterion classification (mandatory, optional, nice-to-have)
- Kano classification
- Carl Wiegers' priority matrix

- 
- Must (Killer)
 - Wish 100
 - Wish 80
 - Wish 50

Questioning techniques

- > How enthusiastic will the customer be?
- > How sad will the customer be?



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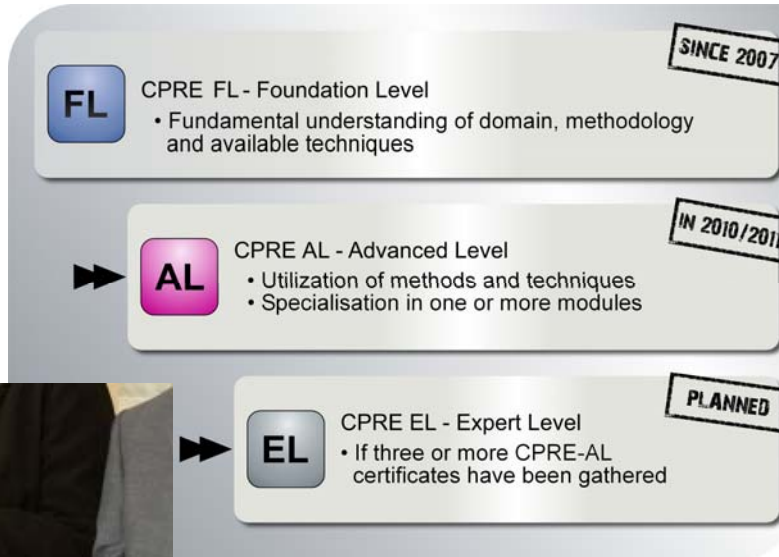
The benefits of managing requirements traces are

- Ease of traceability
- Identification of system's features that are not needed
- Identification of requirements not needed
- Support of impact analysis
- Support for reusability
- Support for accountability
- Support for system maintenance

Requirements constantly change and evolve over the life cycle of a system. We need a change mgt process:

- Classification of each incoming change request
- Determining the effort needed for the change
- Judging cost and benefit of the change request
- Defining new requirements based on the change request
- Deciding whether to accept or decline the change request
- Prioritize the accepted change requests
- Allocate changes to a baseline (and projects affected by this baseline)

CPRE – Certified Professional Requirements Engineer



<http://certified-re.de/>

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Sven Krause
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Thank you
for your attention