

Risk Management with Enhanced Tracing of Requirements Rationale in Highly Distributed Projects

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Need for Requirements Tracing

Context

- Globally distributed software development projects (offices in Eastern Europe, Turkey, and China)

Need for Requirements Tracing

- Verification whether the software product meets its requirements;
- Management of volatile requirements → change impact analysis;
- Consistency checking across life cycle artifacts;
- Quality standards like CMMI demand RT.

Levels of Tracing

- Level 1: Technical tracing
- Level 2: Tracing of rationale, decisions, and alternatives
- Level 3: Value tracing

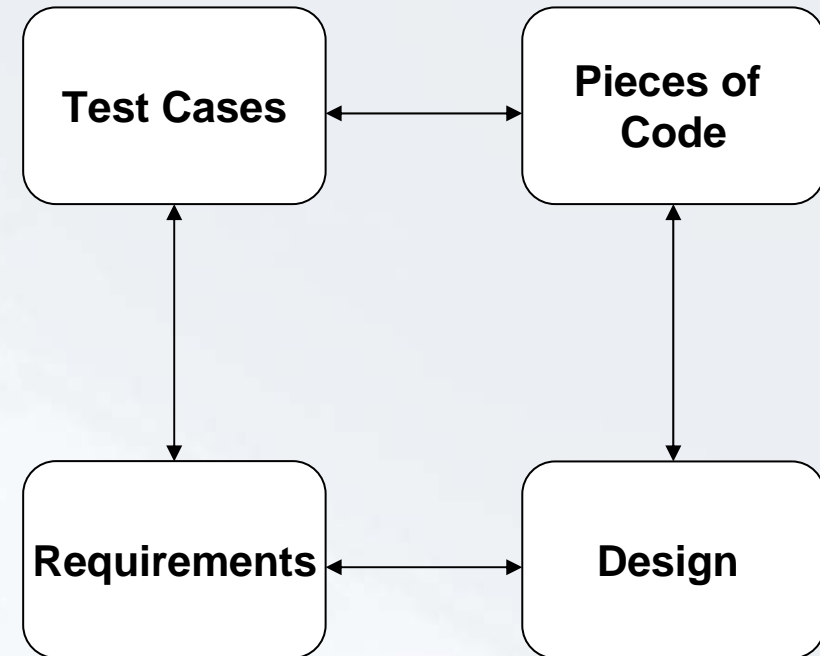
Level 1: Technical Tracing

Meaning

- Tracing of requirements into design, source code, and to test cases
- demanded by quality standards like CMMI

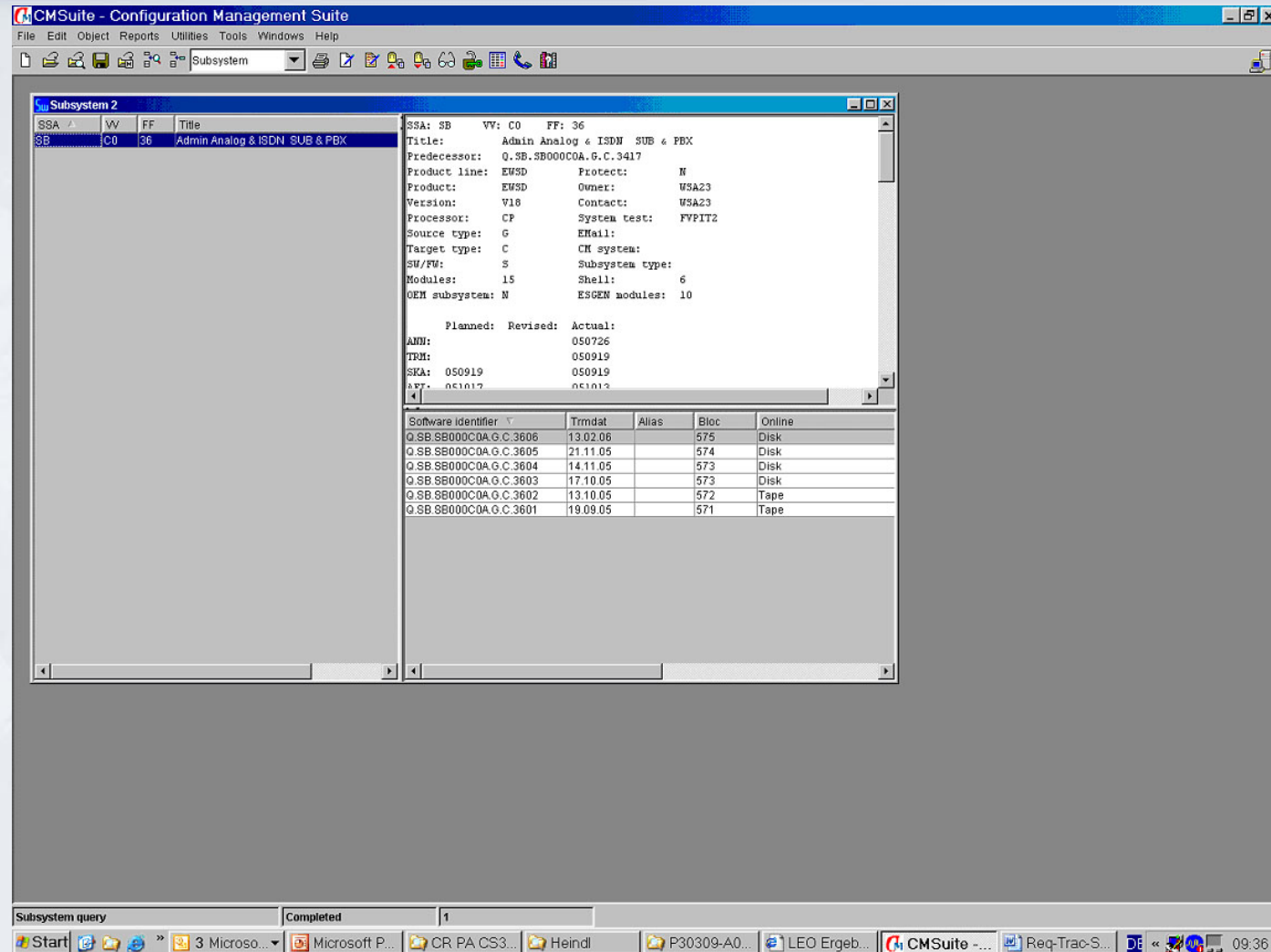
Benefits

- Verification whether the software product meets its requirements;
- Management of volatile requirements → change impact analysis;
- Consistency checking across life cycle artifacts;



Level 1: Technical Tracing

- Project „Conventional Telecom Network“:
 - Uses a self-developed CM Tool
- Tool traces each requirement to:
 - Design specs
 - software modules,
 - Test cases



The screenshot displays the CM Suite interface with a subsystem query window open. The window shows a table of subsystems and a detailed view of the selected subsystem.

SSA	WV	FF	Title
SB	C0	36	Admin Analog & ISDN SUB & PBX

SSA: SB WV: C0 FF: 36
Title: Admin Analog & ISDN SUB & PBX
Predecessor: Q.SB.SB000C0A.G.C.3417
Product line: EWSD Protect: N
Product: EWSD Owner: WSA23
Version: V18 Contact: WSA23
Processor: CP System test: FVPIT2
Source type: G EMail:
Target type: C CM system:
SW/FW: S Subsystem type:
Modules: 15 Shell: 6
OEM subsystem: N ESCEN modules: 10

Planned: Revised: Actual:
ANN: 050726
TRM: 050919
SKA: 050919 050919
APR: 051017 051017

Software identifier	Trmdat	Alias	Bloc	Online
Q.SB.SB000C0A.G.C.3606	13.02.06		575	Disk
Q.SB.SB000C0A.G.C.3605	21.11.05		574	Disk
Q.SB.SB000C0A.G.C.3604	14.11.05		573	Disk
Q.SB.SB000C0A.G.C.3603	17.10.05		573	Disk
Q.SB.SB000C0A.G.C.3602	13.10.05		572	Tape
Q.SB.SB000C0A.G.C.3601	19.09.05		571	Tape

Subsystem query: Completed 1

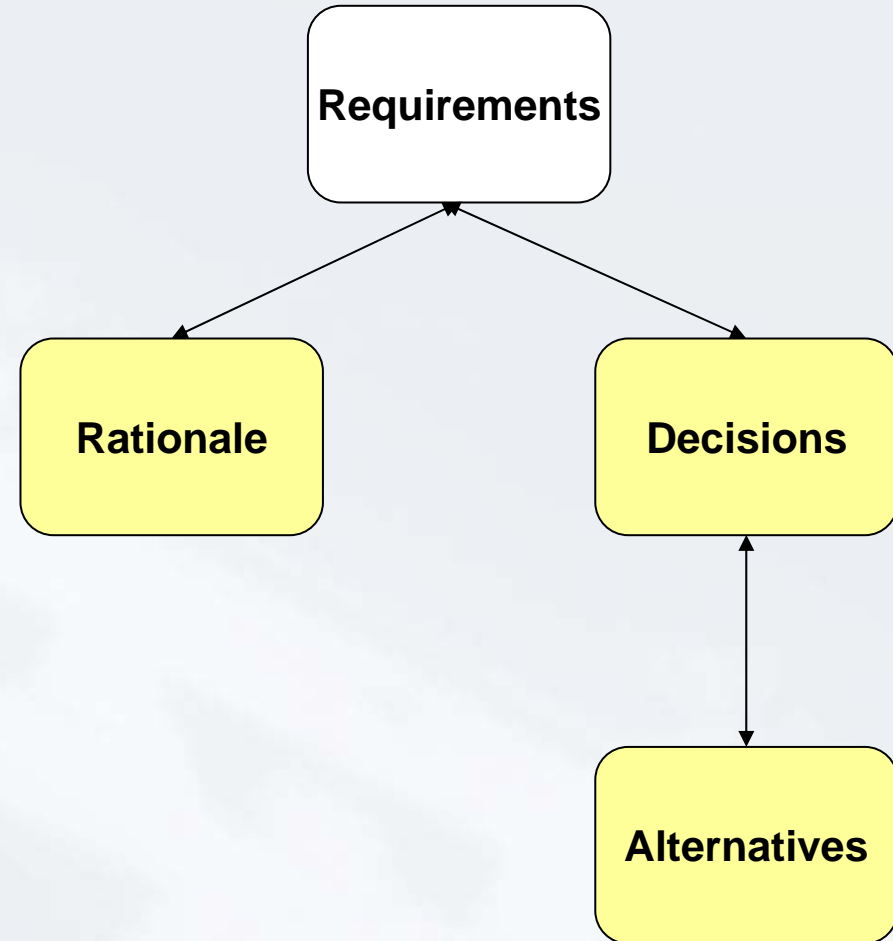
Level 2: Tracing of rationale, decisions, and alternatives

Meaning

- Relating requirements to their rationale;
- Document decisions and rejected alternatives that reflect why the requirements is as it is

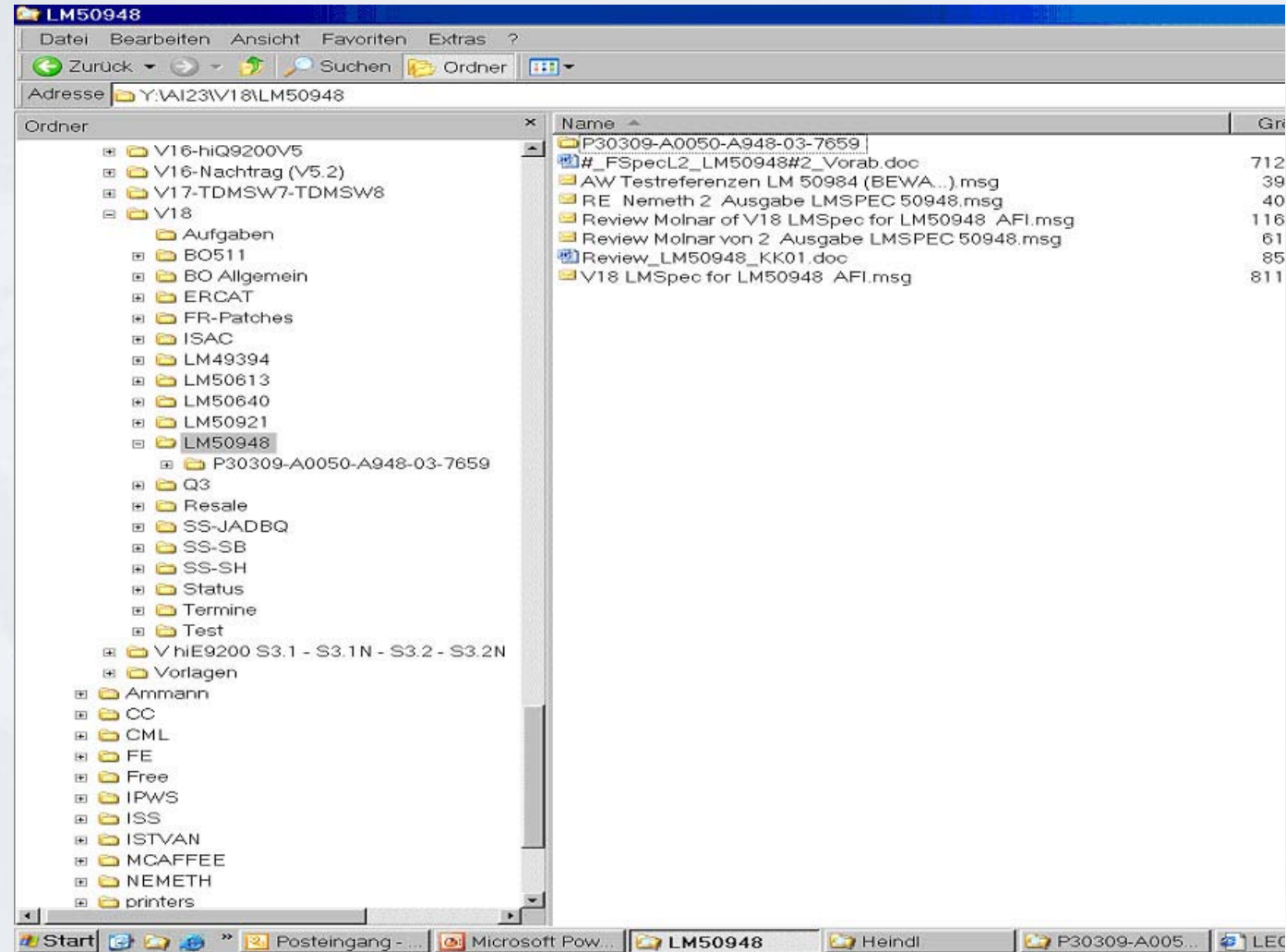
Benefits

- **Understanding the Why of requirements**
 - Documenting rationale for requirements of requirements
- **Support of requirement clarification**
 - by tracing the history of requirements-related decisions and rejected alternatives



Level 2: Tracing of rationale, decisions, and alternatives - Example

- directory structure behind the CM tool
- 1 directory for each requirement
- Directory contains mails, protocols, documents that explain the history of the requirement

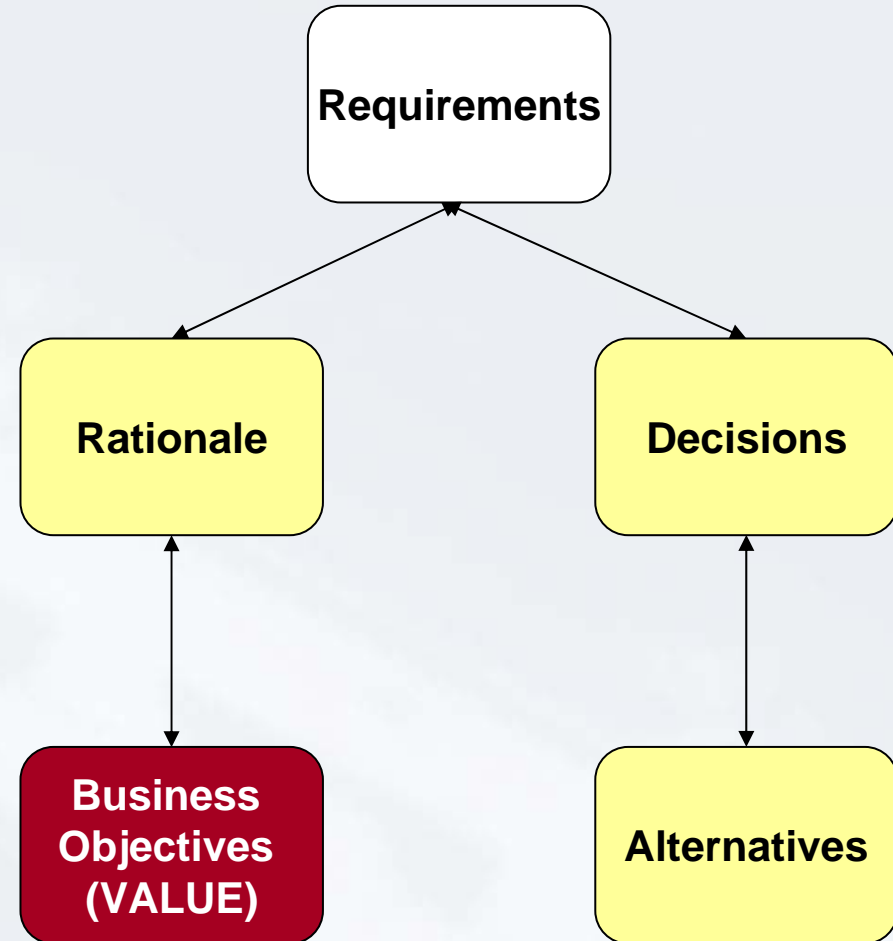


Meaning

- Relating requirements to their rationale;
- Document decisions and rejected alternatives that reflect why a requirement is as it is

Benefits

- **Understanding where the value of the system/software comes from**
 - Explicit models of stakeholder value
- **Better alignment of technical decisions to stakeholder value**



Level 3: Value Tracing - Examples

- Business Opportunities Spec:
 - “roadmap” (collection of future features)
 - stakeholder value
 - And traces to affected requirements

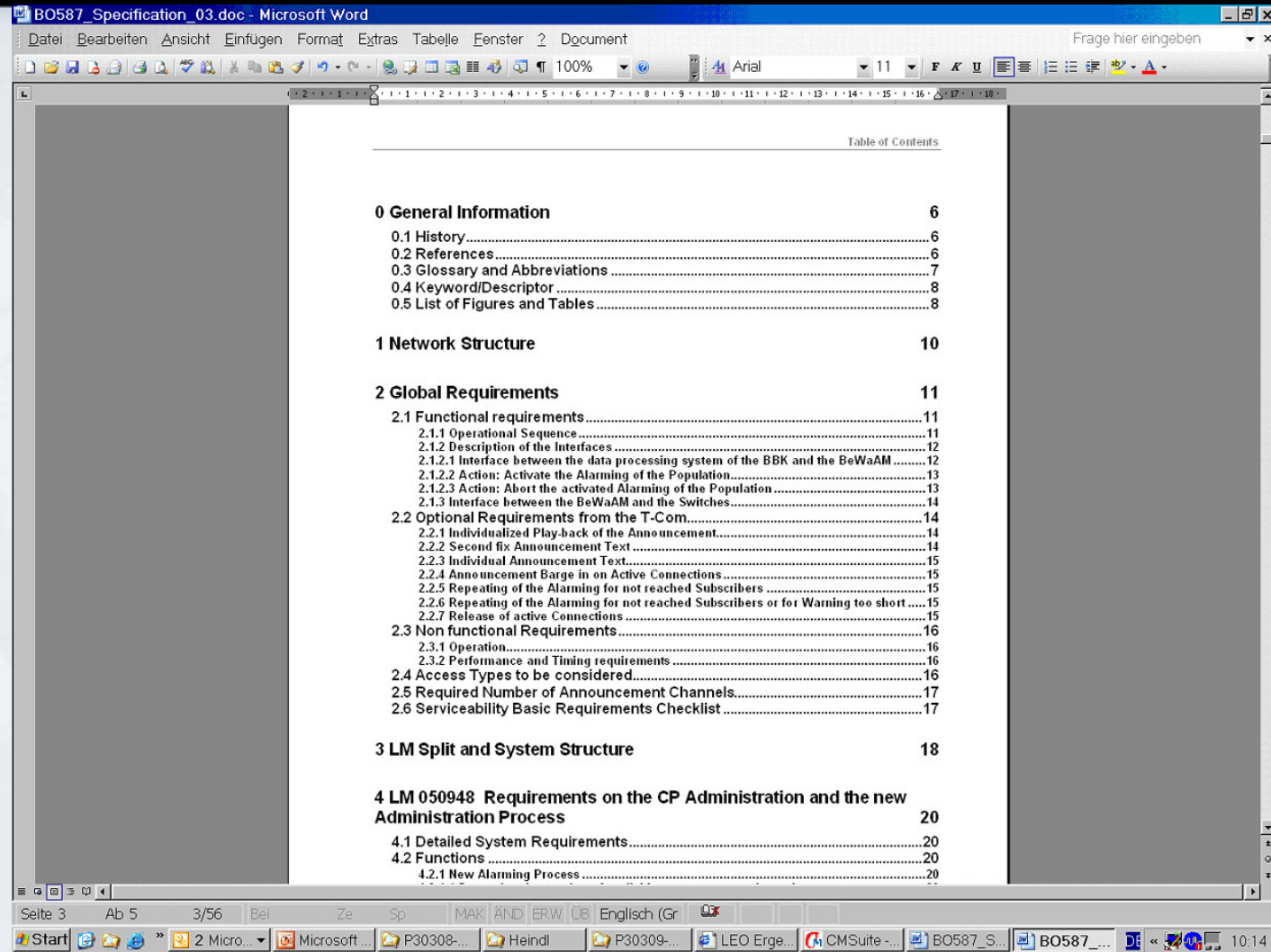


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Evaluate:

- **how well enhanced tracing supports requirements clarification, and communication in GSD projects**
- **types of highly distributed projects**
 - at PSE that could benefit from tracing rationale, decisions, and alternatives (identify project parameters, e.g., duration, number of sites, etc.)
- **for which requirements such additional tracing efforts pay off?**
 - Unusual requirements vs. simple requirements
- **how value can be made explicit?**
 - In order to better align requirements-related decisions (release planning, selection of an optimal technical solution) to stakeholder value propositions