Alles hat zwei Seiten, auch das RE
Ein Streitgespräch unter Kollegen

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Alan M. Davis
Requirements Engineering, Both Sides of the Issues. 16th IEEE RE Conference, 2008

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What and How

What and How must be clearly separated

- Requirements should not define solutions (the HOW), but only the problem (the WHAT)
- If you state solutions in requirements, you restrict the choices the implementers can make
- Product Managers don't know about technical solutions, but they know about customer needs.
- Developers know about technical solutions and feasibility, let them write technical specifications.
- This is the well established separation of requirements (Lastenheft) and design specifications (Pflichtenheft)
- Matches organizational setup: business vs. technical

What and How depend on each other

- Both are interface documents for communication between different domains, e.g. Marketing – R&D, or Architect – Developer
- Design happens in successive refinements: from Needs to Concept to Requirements to Design Spec …
- WHAT/HOW depends on a reader's viewpoint: one person's WHAT is another person's HOW
- Lastenheft/Pflichtenheft are from the contracting business and have legal meaning, we are more interested in cooperative processes
- Mapping from needs to feasible solutions becomes transparent
- Business people like to think in terms of solutions, not problems – so let's talk about solutions in their language

What and How

What and How must be clearly separated

… may be appropriate for:

- purchaser ./. supplier setting
- green field projects

What and How depend on each other

… may be appropriate for:

- in-house implementers
- agile projects
- brown-field and maintenance projects

To document or not

Documented requirements are important

- Externalize knowledge, independent of people
- User needs and design decisions are important to know, and are hard to “reverse-engineered” from the product itself
- Requirements are needed by testers, technical writers, maintenance staff, …
- Basis for system transformation
- Re-use of components are simpler

We got the code, who needs documents

- Who has time to write and maintain all those documents?
- Comprehensive documentation is obsolete by the time it is finished
- Better feedback loop from developer to product owner
- Use the source, Luke

To document or not

Documented requirements are important

… may be appropriate for:

- long-lived products
- products or systems with multiple components, developed by different teams
- when developers and product owner are not co-located
- highly regulated environments

We got the code, who needs documents

… may be appropriate for:

- one-shot projects
- homogeneous software projects
- small teams

Clear cut or murky waters?

Requirements must be complete before design & implementation

- Project resources can be determined
- Project efforts can be determined
- Clear view of expected output
- serenity and stability
- Big picture for IT architecture

Requirements continue to evolve trough implementation

- Feedback loop for improvements
- High flexibility
- Make use of specific resources as needed
- Identified mistakes can be removed before shipping the product
- Priority driven
- Ignore less relevant Business requirements
- Profit from from lessons learned – add new requirements
- Smaller scope can be handled easier

Clear cut or murky waters?

Requirements must be complete before design & implementation

… may be appropriate for:

- Waterfall, incremental process models
- Supply /demand model
- Tendering procedures (WTO)
- Regulated environments
- inexperienced team
- Big bang

Requirements continue to evolve trough implementation

… may be appropriate for:

- Iterative approaches (agile)
- Interdisciplinary teams
- Product development (innovation)
- Staged roll-outs

Traceability

Traceability is essential

- How can you know you are building the right thing without linking design to requirements?
- No change management / impact analyses without it
- Helps with automatic testing, test coverage analysis, …
- Helps with reuse of design artifacts: modify requirements for new product → know what modules are affected
- Traceability is required by law (medical, automotive, …)

Traceability is not practical and too expensive

- Developers don't have time to create and maintain traces
- People aren't disciplined enough to maintain traces, and trace links are worthless if not 100% correct
- Requirements are in the problem domain, design artifacts are in the solution domain (Jackson) – there is no 1:1 mapping
- What is the purpose anyway? Impact analyses? Change management? Justification?
- Doesn't work for NFRs
- Difficult if you don't have integrated tool landscape / Application Lifecycle Management (ALM)

Traceability

Traceability is essential

… may be appropriate for:

- highly regulated environment
- many changes anticipated
- highly integrated Application Lifecycle Management (ALM)

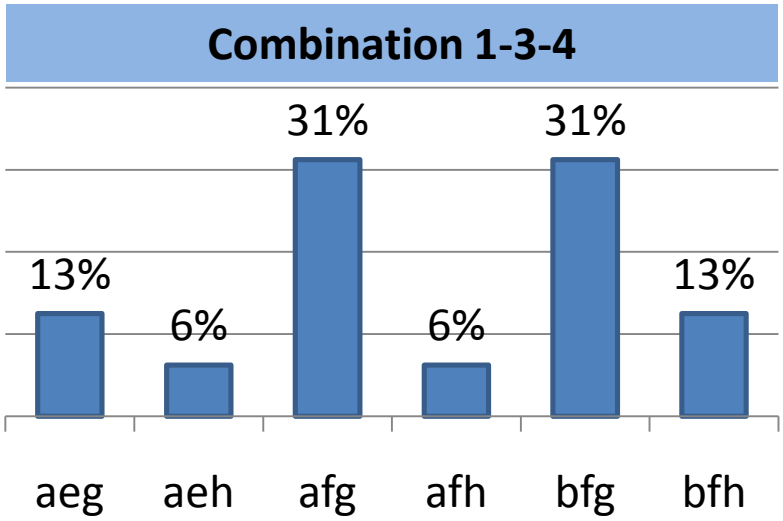
Traceability is not practical and too expensive

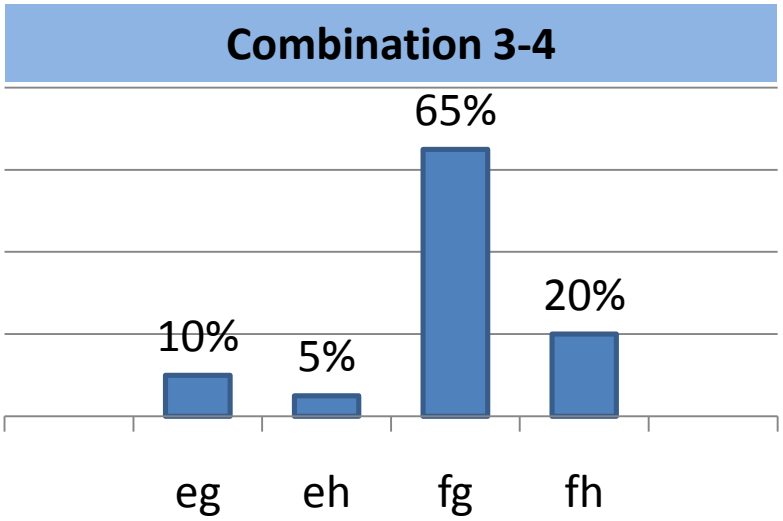
… may be appropriate for:

- one-shot products
- Prototypes
- not supported by tools and processes

Survey at REconf 2010 – 17 participants

1. What and How	a. What and How must be clearly separated	55%
	b. What and How depend on each other	45%
2. To document or not	c. Documented requirements are important	100%
	d. We got the code, who needs documents	0%
3. Clear Cut or Murky Water	e. Requirements must be complete at the start of the project	20%
	f. Requirements can be refined iterative during the project	80%
4. Traceability	g. Traceability is essential	75%
	h. Traceability is not practical and too expensive	25%





Evaluation – agile or not?

a. What and How must be clearly separated:
   Separation of requirements elicitation and solution design → waterfall approach likely
b. What and How depend on each other:
   No strict separation of requirements elicitation and solution design → interdisciplinary work likely, agile approach possible
c. Documented requirements are important:
   product of value and longer term use → any approach possible
d. We got the code, who needs documents:
   product of little value or short term use → agile approach most likely
e. Requirements must be complete at the start of the project:
   full scope defined upfront → agile approach unlikely; waterfall or incremental approach possible
f. Requirements can be refined iterative during the project:
   full scope not defined upfront → agile approach likely; incremental approach possible; pure waterfall highly unlikely
g. Traceability is essential:
   Many motivations → any approach possible
h. Traceability is not practical and too expensive:
   Iteration, interdisciplinary work requires some (transient at least) traceability → agile approach less likely

→ Mature agile implementation: bdfg

→ Pure Waterfall: aceg