Part I: Fundamentals

Part II: Requirements Engineering Practices

Part III: Enablers and Stumbling Blocks

Conclusions

References
14 Requirements tools

What can be supported by a RE tool?

- Elicitation
- Documentation
- Modeling
- Management (Store and retrieve, prioritize, trace,...)
- Validation (simulators, model checkers,...)
Support levels for RE tools

- General purpose
  - Word processors
  - Spreadsheet tools
  - General purpose graphic drawing tools

- Database-level
  - Requirements management tools for organizing, storing, retrieving and tracing requirements

- Language&Method-based
  - Tools supporting specific requirements languages, e.g. drawing state machine diagrams
  - Tools for supporting specific methods, e.g. validation with model-checking
Which RE tool should I use / buy?

- No general recommendation possible
- Depends on what the tool(s) shall support
- An up-to-date list of requirements tools is maintained at the VOLERE website:
  
  http://www.volere.co.uk/tools.htm
We no longer believe in big, unambiguous, and complete requirements specifications as the standard result of good Requirements Engineering.

- Although many standards and textbooks still do

- Modern RE is value-driven: the effort invested into RE is determined by the value that the requirements create

- Depends on domain and project context, driven by various factors, in particular
  - Shared understanding
  - Risk
  - Customer-supplier relationship
16 RE under time pressure

- **Risk-oriented** specification
  - The risk determines the needed effort, not the available time frame!

- Don’t specify in uniform depth
  - Only the risky stuff in full detail
  - The rest coarsely or not at all

- Employ **incremental processes**

- Don’t strive for perfection; **good enough suffices**
What is indispensable?

- Know and involve the critical stakeholders
- Know the problem
- Identify the key goals
- Define the key terms (of the domain and the system) in a glossary
- Identify and document the system’s main functions and use cases
- Identify and document critical quality requirements, constraints and risks
- Identify critical domain assumptions and domain constraints
What makes it harder? (implies higher effort)

- High complexity of the domain
- Team is not familiar with the domain
- Many stakeholders
- Distributed development and/or stakeholders
- Long cycle time
- Safety-critical requirements
- High project risks
Wally, we don't have time to gather the product requirements ahead of time.

What do you reply to your boss?
Part I: The Fundamentals

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Conclusions

References
Requirements Engineering in a nutshell

- Stakeholders are key
- **Validate** your requirements **early and frequently**
- **Work value-oriented:**
  - Cost and benefit of requirements need to be in balance
  - Concentrate on the essential – don’t just collect tons of detailed requirements
- **Work risk-driven:** the more risk, the more extensive and precise requirements specifications are necessary
- **Intertwining of requirements and design is natural** – you’ll need to live with it
Situate your system in its context
  - Value is only created when using systems in their real world context – so you need to know this context
  - Elicit and document domain assumptions and constraints

No discovery: Requirements must be elicited with serious endeavor, they can’t be just discovered

Strive for innovation: just automating what we have today is not enough

You are not the stakeholders’ voice recorder – elicit and design requirements that make stakeholders excited
Requirements Engineering in a nutshell – 3

- **Control requirements evolution** – otherwise requirements evolution will control you
- **No universal language or method**: You’ll need to use a variety of practices and languages
- **Specifying is not programming**: Skip all technical details which are not part of the problem
- **Finally: make it fun**. Nobody likes boring tasks. Make RE a *fascinating expedition* into the *unknown*, to places where *the desirable and the doable meet* and eventually merge into *exciting new opportunities*. 
Conclusions

Follow the principles.
Practice the practices.
Be guided by the risk.
Strive for value.