Requirements engineering

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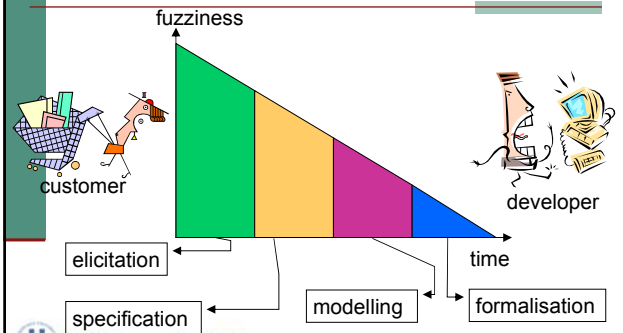
Contents

- The Requirements Engineering (meta-) process
- The Requirements specification
- Formal specifications
- Research issues

Process



Elicitation

Purpose:

- Understand the true needs of the customer
- Trace future implementation to needs

Process:

- Interviews
- Observations
- Prototyping
- Invention

80% of telecommunication requirements come from standards

Interviews

Process:
- Start
- Q & A
- Summary teach-back
- Thank you!
- What's next

Kinds:
- Structured
- Unstructured

Tips
- Be 2 interviewers – shift roles
- Plan the interview
- Don't stick to the plan – use feelings
- Let the customer talk
- Prepare ice-breakers
- Probe thinking

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Requirements specification

- Requirements are specified in natural, but domain-specific language
- Should not consider design solutions
- A contract between customer and developer
- Starting point for the vendor's:
  - developers
  - testers
  - tech writers
  - managers
  - marketing people
  - software acquisition people

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Requirements specification

Requirements are:
- Numbered
- Inspected
- Prioritised
- Unambiguous
- Testable
- Complete
- Consistent

- Traceable
- Feasible
- Modifiable
- Useful for:
  - operation
  - maintenance
  - customer
  - developer
  - ….

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Requirements specification

Table of contents
1 Introduction
- 1.1 Purpose
- 1.2 Scope
- 1.3 Definitions, acronyms and abbreviations
- 1.4 References
- 1.5 Overview

2 Overall description
- 2.1 Product perspective
- 2.2 Product functions
- 2.3 User characteristics
- 2.4 General constraints
- 2.5 Assumptions and dependencies
- 2.6 Lower ambition levels

3 Specific requirements
4 Supporting information
- 4.1 Index
- 4.2 Appendices

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3 Specific requirements

3.1 Interface requirements
- 3.1.1 User interfaces
- 3.1.2 Hardware interfaces
- 3.1.3 Software interfaces
- 3.1.4 Communication interfaces

3.2 Functional requirements
- 3.2.1 Information flows
- 3.2.2 Process description
- 3.2.3 Data construct specification
- 3.2.4 Data dictionary

3.2 Classes
- 3.2.1 Class1
  - 3.2.1.1 Attributes
  - 3.2.1.2 Functions
  - ....
- 3.2.n Class n
  - 3.2.n.1 Attributes
  - 3.2.n.2 Functions

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Modelling

- Representation in semi-formal notation
- Often diagrammatic representation
- Examples:
  - Object-orientation, use-cases, state-machines
  - Activity diagrams
  - Data flow diagrams
  - Entity-relationship models

Requires a paradigm shift to give full advantage

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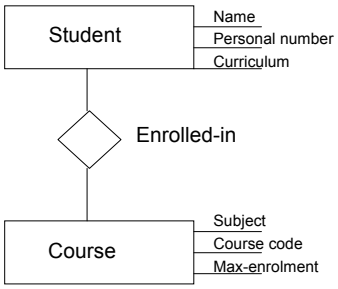
Data model: ER-diagram



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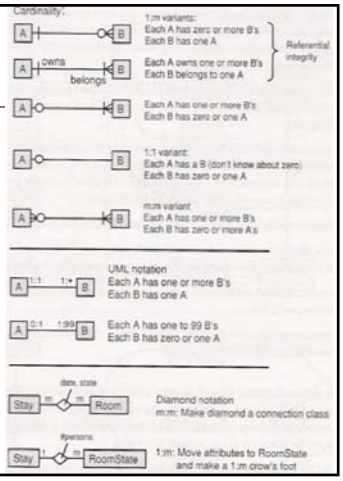
Different formats



Formalisation

- Represents requirements in a mathematical notation
- Interpretation with logic gives possibilities:
  - Consistency check
  - Proof of correctness
  - System simulation
  - Unambiguity
- Examples: Z, VDM, NP-tool,...

Requires thorough education

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Z example

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Non-Functional Requirements

- NFR bears on the behaviour and quality of the forthcoming soft-ware

Case study results:

- there seems to be a common understanding about what a NFR is even though more precise wording is needed
- it is hard to discover NFRs
- it is hard to express NFRs
- modern processes, such as RUP, are function-oriented so there is a risk NFR are not prioritised or remembered

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Validation of requirements

- Reading
- Cross-referencing
- Interviews
- Checklists
- Scenarios
- Proofs
- Prototyping

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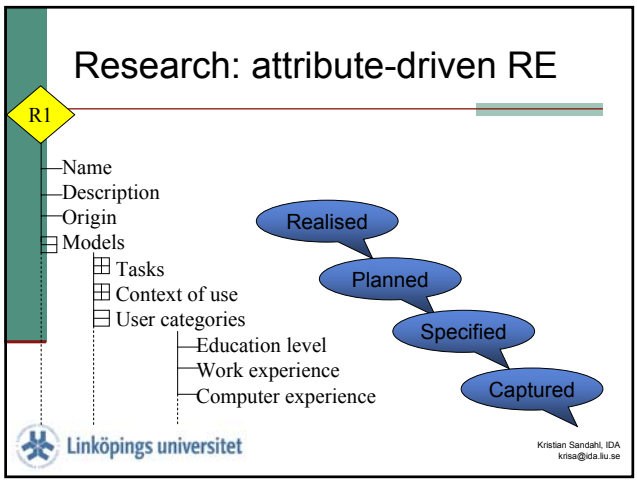
Research: attribute-driven RE
R1
Name
Description
Origin
Models
Tasks
Context of use
User categories
Education level
Work experience
Computer experience
Realised
Planned
Specified
Captured
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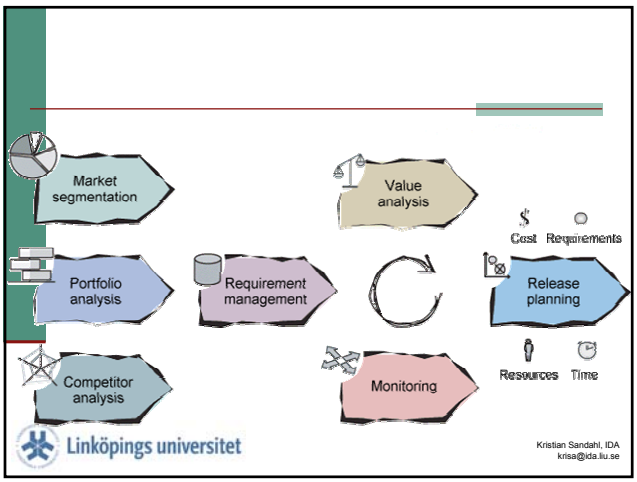
Market segmentation
Value analysis
Cost
Requirements
Portfolio analysis
Requirement management
Release planning
Competitor analysis
Monitoring
Resources
Time
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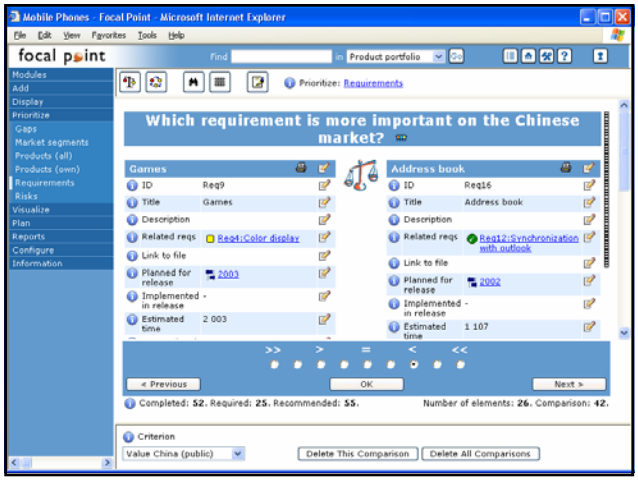
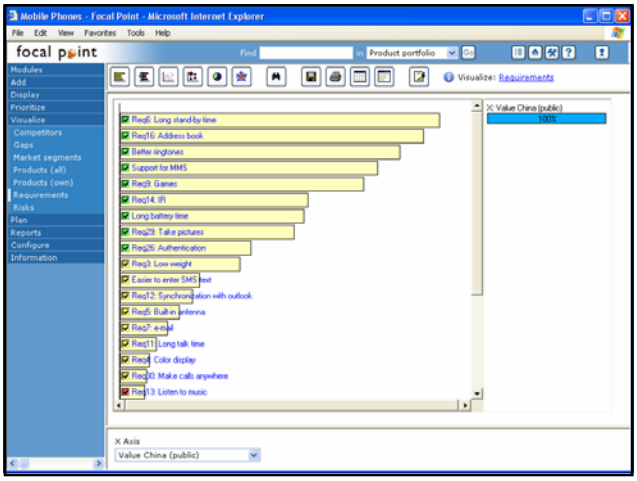

Mobile Phones - Focal Point - Microsoft Internet Explorer
focal point
Which requirement is more important on the Chinese market?
Games
Address book
Delete This Comparison
Delete All Comparisons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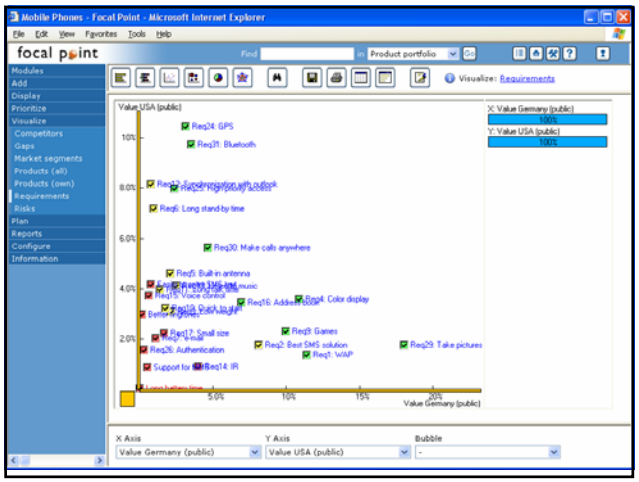
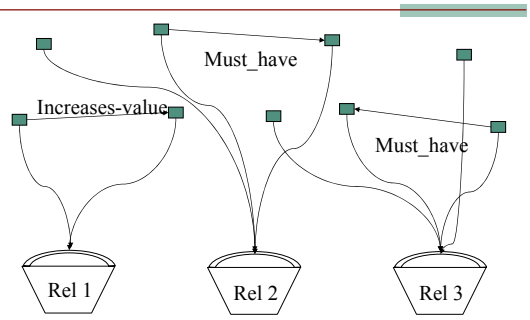


Research: release planning



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SiREN Swedish Requirements Engineering Research Network

Swedish Requirements Engineering Research Network

SiREN-noder (nodansvarig):

- SERG, Lunds Universitet (Dr Björn Regnell)
- SERL, Blekinge Tekniska Högskola (Dr Mikael Svahnberg)
- PELAB, Linköpings Universitet , (Prof. Kristian Sandahl)
- ISEE, Högskolan i Skövde, (Dr Anne Persson)
- ICS, Kungliga Tekniska Högskolan, (Dr Patrik Forsgren)
- SEG, Umeå Universitet, (Dr Jürgen Börstler)

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