Vragen

- Waarom is *domein analyse* cruciaal voor goede requirements?
- Waarom is scoping bij probleem definitie belangrijk?
- Wat is het verschil functionele en niet-functionele requirements?
- Wat is de relatie tussen requirements en testen?

Conceptual modeling

- You model part of reality: the Universe of Discourse (UoD)
- This model is an explicit conceptual model
- People in the UoD have an implicit conceptual model of that UoD
- Making this implicit model explicit poses problems:
  - analysis problems
  - negotiation problems

Conceptual modeling

- Requirements engineering is difficult
- Success depends on the degree with which we manage to properly describe the system desired

Conceptual modeling

- Beware of subtle mismatches:
  - a library employee may also be a client
  - there is a difference between `a book` and `a copy of a book`
  - status info `present` / `not present` is not sufficient; a (copy of a) book may be lost, stolen, in repair, ...

Conceptual modeling

- **Humans as sources of information:**
  - **different backgrounds**
  - **short-term vs long-term memory**
  - **human prejudices**
  - **limited capability for rational thinking**

Conceptual modeling

- **How we study the world around us:**
  - **people have a set of assumptions about a topic they study (paradigm)**
  - **this set of assumptions concerns:**
    - **how knowledge is gathered**
    - **how the world is organized**
  - **this in turn results in two dimensions:**
    - **subjective-objective (wrt knowledge)**
    - **conflict-order (wrt the world)**
  - **which results in 4 archetypical approaches to requirements engineering**

Conceptual modeling

- **Four approaches to RE:**
  - functional **(objective+order): the analyst is the expert who empirically seeks the truth**
  - social-relativism **(subjective+order): the analyst is a `change agent'. RE is a learning process guided by the analyst**
  - radical-structuralism **(objective+ conflict): there is a struggle between classes; the analyst chooses for either party**
  - neohumanism **(subjective+conflict): the analyst is kind of a social therapist, bringing parties together**

Elicitation techniques

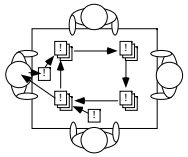
- **Asking:**
  - **interview**
  - **Delphi technique**
  - **brainstorming session**
- **Observing**
  - **task analysis**
  - **scenario analysis**
  - **ethnography**
  - **form analysis**
  - **synthesis from existing system**
- **Others:**
  - **analysis of natural language descriptions**
  - **domain analysis**
  - **Business Process Redesign (BPR)**
  - **prototyping**

Interviewing

- Conduct a series of interviews
  - Ask about specific details
  - Ask about the stakeholder's vision for the future
  - Ask if they have alternative ideas
  - Ask for other sources of information
  - Ask them to draw diagrams

Brainstorming

- Appoint an experienced moderator
- Arrange the attendees around a table
- Decide on a 'trigger question'
- Ask each participant to write an answer and pass the paper to its neighbour



- *Joint Application Development (JAD)* is a technique based on intensive brainstorming sessions

Observation

- Read documents and discuss requirements with users
- Shadowing important potential users as they do their work
  - ask the user to explain everything he or she is doing
- Session video taping

Task Analysis

- Task analysis is the process of analyzing the way people perform their jobs: the things they do, the things they act on and the things they need to know.
- The relation between tasks and goals: a task is performed in order to achieve a goal.
- Task analysis has a broad scope.

Task Analysis

- Task analysis concentrates on the current situation. However, it can be used as a starting point for a new system:
  - users will refer to new elements of a system and its functionality
  - scenario-based analysis can be used to exploit new possibilities

Scenario-Based Analysis

- Provides a more user-oriented view perspective on the design and development of an interactive system.
- The defining property of a scenario is that it projects a concrete description of an activity that the user engages in when performing a specific task, a description sufficiently detailed so that the design implications can be inferred and reasoned about.

Scenario-Based Analysis (example)

- first shot:
  - check due back date
  - if overdue, collect fine
  - record book as being available again
  - put book back
- as a result of discussion with library employee:
  - what if person returning the book is not registered as a client?
  - what if the book is damaged?
  - how to handle in case the client has other books that are overdue, and/or an outstanding reservation?

Scenario-Based Analysis

Scenario view
- concrete descriptions
- focus on particular instances
- work-driven
- open-ended, fragmentary
- informal, rough, colloquial
- envisioned outcomes

Standard view
- abstract descriptions
- focus on generic types
- technology-driven
- complete, exhaustive
- formal, rigorous
- specified outcomes

Form analysis

Proceedings request form:

Client name	……
Title	……
Editor	……
Place	……
Publisher	……
Year	……

Certainty vs uncertainty

Prototyping

- The simplest kind: ***paper prototype***.
  - a set of pictures of the system that are shown to users in sequence to explain what would happen
- The most common: a mock-up of the system's UI
  - Written in a rapid prototyping language
  - Does *not* normally perform any computations, access any databases or interact with any other systems
  - May prototype a particular aspect of the system