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Chapter 2
Requirements Determination

Topics

- From business processes to solution envisioning
- Functional and nonfunctional requirements
- Requirements elicitation
  - traditional methods and modern methods
- Requirements negotiation and validation
- Requirements management
- Requirements business model
  - system scope, business use case model, business glossary, business class model
- Requirements document

4. Requirements negotiation, validation and management

- elicited requirements need to undergo careful negotiation and validation with all stakeholders
- requirements identification and classification
- requirements hierarchies
- change management
- requirements traceability

Requirements negotiation and validation

- Needed because reqs
  - **overlap** and **conflict** → requirements dependency matrix (next slide)
  - may be **ambiguous** or **unrealistic**
  - may remain **undiscovered**
  - may be **out of scope** (as captured by a reference model such as a context diagram (explained later))
    - sometimes out of the “project” scope, but in the scope of the “information system” (req too difficult to implement and should be done manually, may be of low priority, may be implemented in hardware)
- frequently done in parallel with requirements elicitation
- inseparable from the production of requirements document
  - negotiation starts from the draft req doc
  - validation reviews and ‘rubber stamps’ the doc

Requirements dependency matrix

Requirement	R1	R2	R3	R4
R1				
R2	Conflict			
R3				
R4		Overlap	Overlap	

Requirements risks and priorities

- **Risk** is a threat to the project plan
- Risks determine project's **feasibility**
- **Risk analysis** identifies requirements that are likely to cause development difficulties
- **Prioritization** is needed to allow easy rescoping of the project when faced with delays
- **Risk categories**
  - Technical
  - Performance
  - Security
  - Database integrity
  - Development process
  - Political
  - Legal
  - Volatility

Requirements identification and classification

- **Natural language statements**
  - ‘The system shall schedule the next phone call to a customer upon telemarketer’s request.’
- Identification and classification scheme
  - **Unique identifier** (automatically generated)
    - database generated, if possible
    - including version number, if possible
  - **Sequential number with document hierarchy**
    - the seventh requirement in the third section of the second chapter would be numbered 2.3.7
  - **Sequential number with requirement’s category**
    - where the categories of requirements can be: function requirement, data requirement, performance requirement, security requirement, etc

Requirements hierarchies

- Parent-child relationships
- Reflect varying abstraction levels

1. "The system shall schedule the next phone call to a customer upon telemarketer's request."

1.1 “The system shall activate Next Call push button upon entry to Telemarketing Control form or when the previous call has terminated.”

1.2 “The system shall remove the call from the top of the queue of scheduled calls and make it the current call.”

1.3 etc.

Change management

- A requirement may change, be removed, or a new requirement may be added
- *Downstream cost* of change
- Strong management policies needed to
  - document *change requests*,
  - to assess a *change impact*,
  - and to effect the changes
- Requirements changes should be stored and tracked by a *software configuration management tool*

Requirements traceability

- A critically important part, of *change management*
- A *suspect trace* – after change to any element in a traceability relationship

Review Quiz 2.4

1. What is (arguably) the best visual modeling method to capture the system boundary?
2. What kinds of dependencies between requirements are made explicit in a requirement dependency matrix?
3. What is the name of a risk category associated with a scenario in which a requirement is likely to keep changing or evolving during the development process?
4. What are the techniques for identifying requirements?
5. What is the name of a tool dedicated to change management?
6. What is a suspect trace?