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CONSULTING IT

IREB CPRE

1 Basics

- Requirement
  - Types
    - Functional
    - Quality
      - Usability
      - Performance
      - Portability
      - Security
      - SQuaRE ISO 25010
    - Constraints
  - Levels of abstraction
    - Business
    - Stakeholders — Users
    - Domain
    - System
- System
- Stakeholder

2 Fundamental Principles of Requirements Engineering

- 1 Value orientation — Value of requirement vs cost
- 2 Stakeholders
  - Critical
  - Major
  - Trivial
- 3 Shared understanding
  - Explicit
  - Implicit — typical for Agile
- 4 Context
  - System
  - System boundary — Gray area (uncertainty)
  - Context
  - Context boundary — Gray area (uncertainty)
  - Irrelevant environment
- 5 Problem - Requirement - Solution
  - Hierarchical linkage (top down)
  - Feasibility / validation
  - Solution bias
- 6 Validation
  - Quality control
  - Feedback (communication noise)
- 7 Evolution
  - Changes
  - Approaches
    - Permitting changes
    - Maintaining stability
- 8 Innovation
  - Building a competitive advantage
  - Stakeholder satisfaction
- Systematic and disciplined work — Adaptation of the process to the context

3 Documentation and work products

- Characteristics
  - Purpose
    - Single requirements
    - Set of requirements
    - Documentation structures
    - Other
      - Glossary
      - Sketch
  - Method of representation
    - Natural language
      - Phrase templates)
        - User story
        - Standards-based templates
      - Form template
        - Use case specification (UCS)
        - Template for quality requirements
      - Document templates — Requirements specifications
        - Traditional
        - Agile
          - Backlog produktu
          - Backlog sprintu
          - Story mapping
    - Model
      - Use case model
      - Context model
        - DFD
        - Diagram PU
        - Nieformalna notacja blokowa
      - Functional requirements models
        - Data and structure
          - UML class diagram
          - ERD
        - Function and flow
          - UML activity diagram
          - BPMN business process model
        - States and behavior
          - UML state transition diagram
      - Goal model — AND OR decomposition (tree)
  - Life span
    - Temporary
    - Evolving
    - Durable
  - Size
- Glossary — Rules for working with the dictionary
- Prototypes
  - Evolutionary
  - Exploratory
- Quality criteria
  - Single requirement
    - Adequate
    - Necessary
    - Unambiguous
    - Complete
    - Understandable
    - Verifiable
  - Requirements document
    - Consistent
    - Nonredundant
    - Complete
    - Modifiable
    - Traceable
    - Compliant

4 Requirements Elaboration

- Sources of requirements
  - Stakeholders
    - Documentation of stakeholder list
    - Techniques for identification
      - Checklists of typical stakeholder groups and roles
      - Organizational structures
      - Business process documentation
      - Market reports
      - Initial stakeholders for identifying additional stakeholders
  - Documents
  - Systems
- Kano Model
  - Delighters (synonyms: excitement factors, unconscious requirements)
  - Satisfiers (synonyms: performance factors, conscious requirements)
  - Dissatisfiers (synonyms: basic factors, subconscious requirements)
- Elicitation techniques
  - Gathering techniques
    - Questioning techniques
      - Interview
      - Questionnaire / survey
    - Collaboration techniques
      - Workshop
      - Crowd-based
    - Observation techniques
      - Observation
      - Apprenticing
    - Artifact-based techniques
      - System archaeology
      - Data analysis / feedback
      - Reuse of requirements
  - Design and idea generation techniques
    - Creativity techniques
      - Brainstorming
      - Analogy
    - Design techniques
      - Scenarios and storyboards
      - Prototyping
- Conflict management
  - Types
    - Subject matter conflict
    - Data conflict
    - Interest conflict
    - Value conflict
    - Relationship conflict
    - Structural conflict
  - Process
    - Conflict identification
    - Conflict analysis
    - Conflict resolution
      - Agreement
      - Compromise
      - Voting
      - Definition of variants
      - Overruling
    - Documentation of conflict resolution (decisions made)
- Validation
  - Validation principles
    - Involvement of the right stakeholders
    - Separating the identification and the correction of defects
    - Validation from different views
    - Repeated validation
  - Validation techniques
    - Review techniques
      - Inspection
      - Walkthroughs
    - Exploratory techniques
      - Prototyping
      - Alpha testing and beta testing
      - A/B testing
      - Building a Minimum Viable Product (MVP)
    - Sample development

5 Process and Working Structure

- Facet
  - Time
    - Linear
    - Iterative
  - Purpose
    - Prescriptive
    - Exploratory
  - Target
    - Customer-Specific
    - Market-Oriented
- Typical process configurations
  - Participatory RE Process — Iterative & Exploratory & Customer-Specific
  - Contractual RE Process — Typically Linear (Sometimes Iterative) & Prescriptive & Customer-Specific
  - Product-Oriented RE Process — Iterative & Explorative & Market-Oriented
- Process configuration
  - 1. Analyze the influencing factors
  - 2. Assess the facet criteria
  - 3. Configure the process
  - 4. Determine work products
  - 5. Select appropriate practices

6 Requirements management

- Life cycle
- Attributes of requirements
- Views/Perspectives
  - Selective view
  - Projective view
  - Aggregating view
- Version
  - Requirements configuration
    - Baseline
    - Configuration dimensions
      - Product dimension
      - Version dimension
  - Version identification
- Traceability
  - Types
    - Backward traceability
    - Forward traceability
    - Tracking between requirements
  - Representation
    - Implicit — Naming conventions
    - Explicit
      - Hyperlinks
      - References
      - Tracking matrices/tables
      - Traceability diagrams
- Prioritization
  - Evaluation criteria
    - Implementation or other costs
    - Value or urgency to the user or other stakeholders
    - Likely frequency of use of the function
    - Legally binding nature of the requirement
    - Relationships between requirements
  - Prioritization criteria (example.)
    - Business value
    - Relevance
    - Urgency
    - Effort
  - Approaches
    - Ad hoc — MoSCoW
    - Analytical
- Change management
  - Process for handling change — Impact analysis
  - Causes of change
    - Market changes
    - New insights
    - Inappropriate requirements
    - Expanded scope
    - Defects

7 Tools

- Types of supporting tools
  - Requirements management
    - Defining and storing requirement attributes
    - Prioritization of requirements
    - Version and configuration management
    - Traceability
    - Change management
  - RE process management
    - Process measurement and reporting
    - Measuring and reporting product quality
    - RE workflow management
  - Documenting knowledge on requirements
    - Sharing requirements
    - Creating a shared understanding
  - Requirements modeling
  - Cooperation in re
  - Requirements testing/simulation
- Aspects of introducing the tool
  - Total tool lifecycle costs
  - Resources required
  - Pilot project
  - Evaluation of the tool according to specific criteria
  - Training of employees