Assessing Economic and Technical Feasibility in Networked Value Constellations

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Outline

• What is the problem?
  – Issues in MIS research
• How do we deal with it?
  – Model-driven approach
  – e³value and UML
• Why should it solve the problem?
  – Benefits, gaps to fill in
• Small example for illustration
• Real-life case study for validation
• Conclusions, further thoughts
• Networked value constellations
  – Joint work (bundle of suppliers) to satisfy complex, IT-based customer (business) need (i.e. Dell)
  – Different business entities with different requirements

• Design of networked value constellations
  – Interplay exists among business and IT engineering

• Problems to deal with
  – Different domains in decision making
  – No constructional (operational) support
Focus

Design of Networked Value Constellation

• Operational support

Feasibility

• Economic = Value perspective
  – Focus on profit and substantial economical effects (i.e. expenses, investments)

• Technological = Information system perspective
  – To find an acceptable IT-driven solution to put the constellation into operation
Research Idea

• Constructional solution based on *conceptual* models
  – To detect inconsistency
  – To provide traceability of decisions taken
  – To achieve shared understanding among stakeholders
  – Exploratory – no heavy formalization

• Based on specialized ontologies (Borst, 1997)
  – Conceptualization for knowledge representation
  – Applied in business domain

• Automated reasoning becomes possible
Value-based modeling: \( e^3 \text{value} \) method (Gordijn, Akkermans (2003, \textit{REJ}))

- Demonstrates the joint value proposition, value distribution and allocation
- Notion of \textit{value activity}: combines different perspectives (IS, process) from an economic value point of view
- Cash-flow analysis built on value objects (profitability sheets)
e³-value in Nutshell

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Extending $e^3$value

- Cost considerations evolve over time
- Only object-based evaluation is not sufficient
  - What about the value activities?
- $e^3$value time series analysis
  - Different time frames evaluated sequentially
- Useful for purposes
  - ROI becomes possible (DNCF)
Economic Value Perspective

Small example taken from a real-life study in the electricity domain

Timeframe 0 (investment):

Timeframe X (operation):
Economic Feasibility with $e^3$value

- Construction of profitability sheets:
  - Evaluation of value objects = valuation functions
  - Evaluation of value activities – how does it happen?
- Further investigation is needed: UML
  - Construction of UML model
  - Information (financial attributes) gained from UML is fed into $e^3$value
• Value activities = UML components
• Financial attributes and technical constraints
• Important construct: expense carrier
Bridging e³value and UML modeling concepts to address economic feasibility
Technical Feasibility

• **UML** = structure of underlying IT architecture
  – Attributes: technical constraints

• **Value model** = structure of value constellation
  – Attributes: dimension of market segments, occurrences

• **Scalability**
  – Important concept of technical feasibility
  – Example: size of market segment and occurrences vs. max nr of invocations
Real-life Case Study I
Conclusion and Further Research

• Model-based analysis as first step forward seems helpful
• Provides operationalized solution
• Analysis of IT and value perspective result in important design questions

• Elaborating on other aspects of technical feasibility – would the initial approach (structure diagram + value model) be successful?
• Process view - how would it help?
• Risk: another potential attribute of UML model constraints – How would it influence our reasoning over feasibility?
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