



Cross-Organizational Workflows: A Classification of Design Decisions

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1. Introduction

2. Value modeling

3. Coordination modeling

4. Workflow design

5. Conclusion



Introduction

- Research goal:
 - To systematically investigate design decisions in cross-organizational workflows
- Results:
 - Three areas of design decisions can be distinguished
 - Design decisions (and supporting modeling techniques) differ for each of them
 - Web service standards such as ebXML, BPEL4WS, and WSCI play a different role in each of them

Three areas of design decisions in cross-organizational workflows

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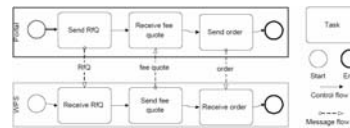
Value modeling

Business network issues: assigning activities to economic actors



Coordination modeling

Inter-business issues: interactions between business partners



Workflow design

Intra-business issues: realizing what is promised to other businesses



- Operations management issues
- IS applications and infrastructure issues

Research method: case study

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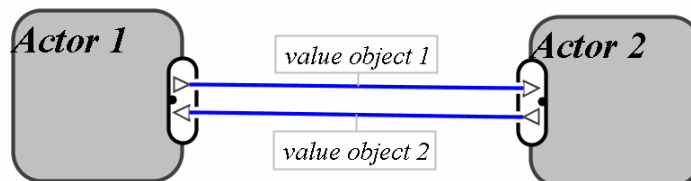
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- Providing portals for 2 Japanese artists
- Portal functionality:
 - Providing general artist information
 - Selling merchandise
 - On-demand printing of lyrics, music scores
 - Forums
 - Real-time chat
- Business partners:
 - Record companies
 - Printing service
 - Delivery (shipping) service
 - Settlement (payment) service

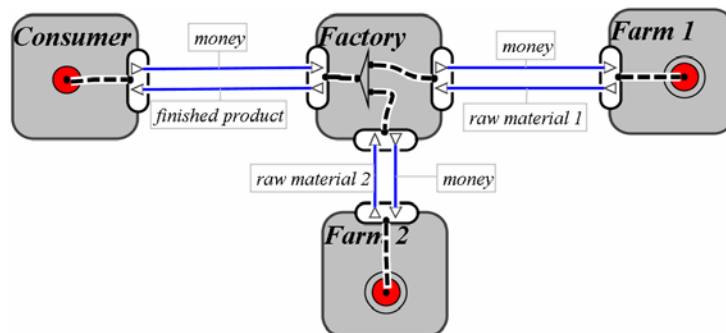
Value modeling technique 1/2

- Value modeling concepts
 - Actor: economically independent entity
 - Value object: thing of value to the actors
 - Value transfer: economical activity
 - Value exchange: pair of value transfers
 - Models economic reciprocity



Value modeling technique 2/2

- Dependency paths indicate causal relations between value exchanges
 - A dependency path is not a business process!!

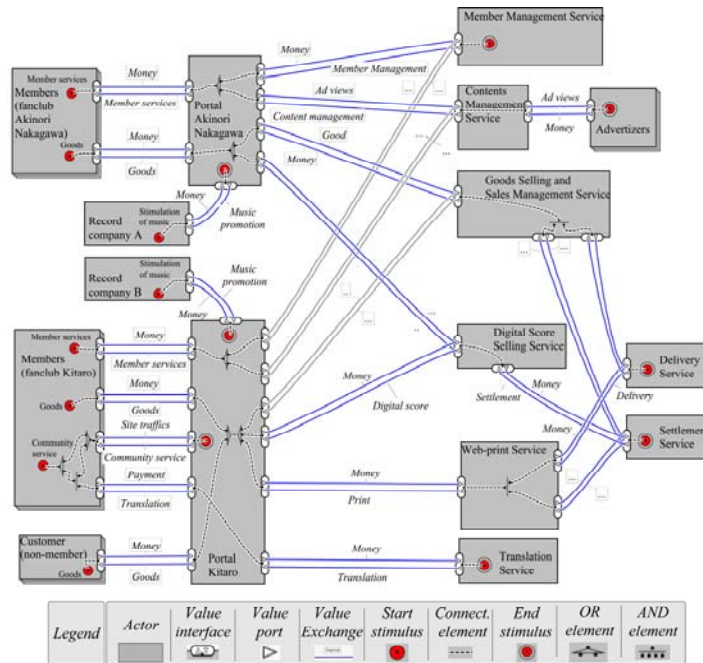


Value modeling design decisions

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- Which consumer needs do exist?
- How are these consumer needs satisfied by items of economic value that can be produced or consumed by enterprises and end-customers, and are by definition of economic value?
- Who is offering/requesting value objects to/from the environment?
- What are the reciprocal value object exchanged between enterprise/end-customers?
- What bundles of value objects exist?
- What partnerships do exist?

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Coordination modeling

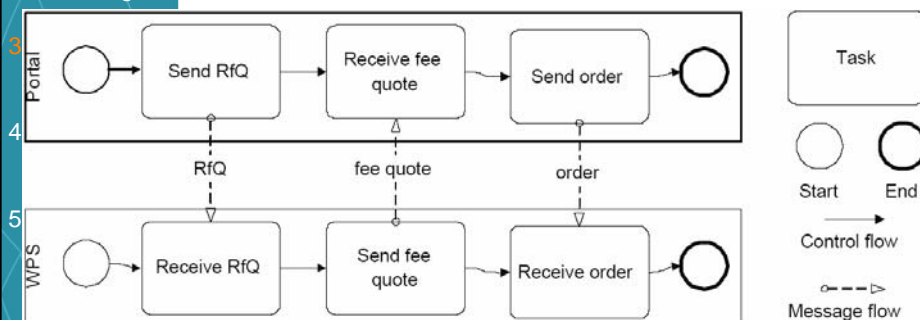
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- Coordination: interaction **between** actors needed to produce a result
- Two kinds of processes:
 - Coordination processes between actors ...
 - ... listing steps of both actors
 - Business processes or workflows ...
 - ... inside (private to) one actor ...
 - ... and designed to execute steps from coordination processes

Coordination modeling example

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2. Value modeling

- Coordination process between portal and web printing service
- This is BPMN notation



Coordination modeling design decisions

Coordination process design decisions

- Which information is exchanged between business partners, and in which order?
- What are the trust relations between the actors?
- Are additional actors needed to resolve trust issues (e.g., trusted third parties?)
- Who is responsible for the coordination activities at each business partner?

IT support design decisions

- What technology to use (e.g., HTML forms, web services)?
- Synchronous or asynchronous information exchange?
- What is the format of the message data exchanged?

Process modeling standards

- BPMN: 3 kinds of processes
 - Coordination process: similar to ours
 - Abstract process: public part of private process
 - Only steps of one actor, only those steps visible to business partners
 - Internal process: similar to workflow
- BPEL4WS: 2 kinds of processes
 - Abstract processes
 - Internal processes

Workflow modeling

Workflow design decisions:

- Mainly concerned with issues in operations management and organization theory, e.g. customer order decoupling point

IT support design decisions:

- What information systems are needed?
- What functions do these information systems need to offer?
- Distribution decisions, e.g. central IT facilities or facilities per location

Example workflow design decision

- Customer-order decoupling point (CODP):
 - Keep e.g. song lyrics on stock ...
 - ... or print them on demand (batch size 1) ...
 - ... or collect a number of orders
- This is most probably a private, secret process step
- Supporting techniques:
 - Standard (“old fashioned”) workflow notations and tools
 - BPEL internal processes
 - Simulation, linear programming

Example workflow process

- Again: BPMN notation (BPEL has no graphical notation, strictly speaking)
- Swimlanes are departments, *not* economic entities

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modeling

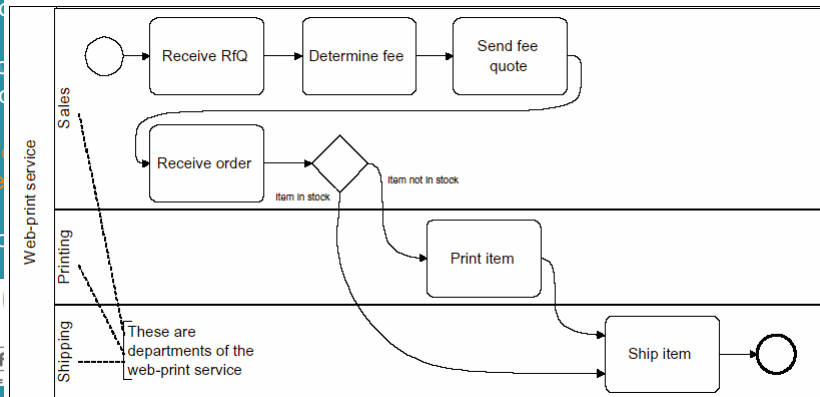
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modeling

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Conclusion

- Three areas of design decisions can be distinguished
- Concerns are really different at each of them; this is **not** refinement
- Modeling techniques differ as well
- Lightweight modeling approach enables multidisciplinary teams of decision makers to design cross-organizational workflows
 - “Don’t leave all decisions to the managers ...”
 - “... and neither to software engineers”

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