On the Challenges of Business Modeling in Large-Scale Reengineering Projects

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Modeling and Reengineering...

How are business models used in large-scale reengineering projects?

"Models are less used, since project members have little modeling expertise and real-world enterprises do not lend themselves to modeling like computerized systems."

"Models are used the same way as in traditional system development projects."

"Models are used in ways particular to reengineering projects."

Modeling and Packaged Solutions...

Is requirements modeling needed for the configuration of packaged ERP systems?

"Modeling not so important. ERP system developed incrementally through a series of prototypes."

"Modeling needed as in traditional system development projects."

"Modeling different because system functionality is pre-defined."

Outline of Presentation

• Large-scale reengineering projects
• ERP reengineering projects
• SAP technology
• Analysis activities in SAP projects
• Hydro Agri’s reengineering project
• Modeling experiences
• Modeling tiers
• Model pragmatics cube
• Challenges of business modeling
• Conclusions

ERP Reengineering Projects

Objective:
• Radically improve business performance by redesigning old business processes or defining new ones.
• Use ERP technology to support or implement business processes

ERP systems:
• Large databases with business data
• Pre-defined modules for business activities
• Business integration and information sharing
• Used as a catalyst for change

SAP R/3 Technology

SAP R/3 architecture:
• Client/server system with customizable (configurable) modules
• Modules can be used as stand-alone components for restricted business activities or they can be integrated to support several activities
• Example modules: Finance, Materials Management, Sales and Distribution

SAP implementations:
• Parameters used to adapt system functionality to business needs
• People and organizational issues more problematic than technical issues
• May lead to dramatic changes of organization or business activities
• Implementation approaches:
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- Around 1000 SAP transactions per module
- SAP delivered with around 800 pre-defined process models
- Pre-defined models adopted to meet the organization's business needs
- Minor adaptations lead to configurational changes - major modifications must be accommodated with add-ons
- Organization charts must respect the limitations in SAP

- 17 production sites in nine European countries
- One of the world's leading producers of fertilizers
- Economic crisis in 1991-92:
  - Lost 12.3 MNOK per week (about 1.6 million Euro)
  - Lost 120,000 NOK per employee

- SAP modules fully implemented: 7 (SD, MM, PM, FI, CO, HR, AM)
- SAP delivered with around 800 pre-defined process models
- Pre-defined models adopted to meet the organization's business needs
- Minor adaptations lead to configurational changes - major modifications must be accommodated with add-ons
- Organization charts must respect the limitations in SAP

- SAP organizational templates defined for the organization's business needs
- SAP organizational templates adapted from pre-defined process models
- SAP delivered with around 800 pre-defined process models
- Pre-defined models adopted to meet the organization's business needs
- Minor adaptations lead to configurational changes - major modifications must be accommodated with add-ons
- Organization charts must respect the limitations in SAP

- End-users: 3,264 (700 concurrent users)
- ERP system implemented: SAP R/3 3.0F
- Project duration: July 1995 - March 1999
- Project costs: US$ 126 million
- Implementation locations: 26 locations in nine countries
- Local business process across sites
- Harmonized business process across sites
- Local business process
- Harmonized business process
- Local business process
- Harmonized business process}

- SAP process structures
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Process Modeling Tiers

Process models structured according to three tiers

- Selection of processes & process decompositions
- Addition of supportive modeling concepts (e.g. tasks, reports)

**Business tier**
- Organizational objectives, risks, value-adding processes, and business performance

**Workflow tier**
- Human interaction/coordination and resources/applications used to execute processes

**Functional tier**
- Functionality of ERP system

Process Modeling Tier Focus

- Most models with functional tier focus
- Some workflow-oriented models for flows involving different units/sites
- A few business-oriented models made by the management reporting team

Implementation

- Most models with workflow tier focus for authorization and training purposes
- Business-oriented models for reporting course

Post-Implementation Improvements

- Most models with business tier focus

Change Management

Tool support for model pragmatics

Model environment should support the manipulation of models at different levels of abstraction, reflecting different points of view, and focusing on different modeling tiers.

- Modeling environment in HAE only supported different levels of abstraction
- Model presentations were made manually
- Expensive
- Difficult to keep presentations consistent and updated

Coherence of modeling tiers

The three tiers of business models are equally important and have to be analyzed as a whole.

- Management reporting needs in HAE project were analyzed with clear focus on business tier. The functional tier was ignored, and HAE missed an opportunity to use standard reports instead of developing HAE-specific reports.
- HAE and HTP set up common construction project flow, so that HTP could use HAE’s SAP solution. Workflow aspects were well taken care of, but lack of business tier focus led to complicated reporting on project costs and project activities for HTP.

Pragmatic variation paradox

Pragmatic variation increases individual user comprehension, but complicates the formation of a common understanding of domain.

- Process models included in training courses were tailored to the intended audience. People attending several courses were confused about the complete flows.
- Implementation teams used models tailored to their modules. Cross-modular aspects were ignored and often not properly understood.
Conclusions

HAE reengineering project
- SAP R/3 3.0 replaced around 120 separate applications
- Large project, 26 locations in 9 countries, multi-lingual project

Modeling Experience
- Business models used in all phases
- A variety of model presentations needed
- Process models include three different tiers of information
- Model presentations can be described along three dimensions: tier focus, viewpoint, and level of abstraction

Modeling challenges
- Tool support for model pragmatics
- Coherence of modeling tiers
- Pragmatic variation paradox