Methods for the specification and verification of business processes

MPB (6 cfu, 295AA)

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05 - Methodology
Objective

Coarse-grained methodology for developing business process management solutions

Guidelines for process designers to plan and conduct business process management projects

Ch.1.3, 8 of Business Process Management: Concepts, Languages, Architectures
Levels of Business Processes

1. Business Strategy
   - Focus on overall operations of the company
   - Determine the operational goals, such as focus on customers, cost efficiency, leadership in innovation or quality or price

2. Goals
   - Strategy and Organization
     - Focus on individual business processes

3. Organizational Business Processes
   - Implemented Business Processes

4. Operational Business Processes
Levels of business processes

Business Strategy

determines

realize

long-term company strategies
to develop sustainable success in the market
Business strategies

Competitive Advantage

A competitive advantage is one gained over competitors by offering consumers better value.

You increase value by lowering prices or increasing benefits and services to justify the higher price.
Business strategies

Cost Leadership Strategy
To compete for the largest number of customers through price.

Cost leadership pays off when the goods or services are standardized: generic acceptable goods sold at the lowest prices.

Minimize costs to the company and minimize costs to the customer without decreasing profits.
Business strategies

Differentiation Strategy
Provide a product or service with distinctive qualities valued by customers.

Attract customers because products are set apart from the competition.

Leading scientific research needed: highly skilled and creative product development team; a strong sales and marketing team.
Business strategies

Focus Strategy
Concentrate on a particular customer, product line, geographical area, to serve a limited group of customers better than any competitor who serve a broader range of customers.

A focus strategy works well for small but aggressive businesses.
Levels of business processes

long-term company strategies
to develop sustainable success in the market

define operational goals that
contribute to the realization of the business strategy
Management implements the business strategy by defining operational goals.

**Profitability:**
To increase revenue while limiting expenses

**Customer Service:**
To improve response time to customer complaints

**Efficiency:**
To implement a new shipping procedure that improves delivery time
Levels of business processes

Informal & semiformal techniques: plain text + diagrams + forms-based

- **Business Strategy**
  - Determines
  - Realizes
  - Long-term company strategies to develop sustainable success in the market

- **Operational Goals**
  - Determines
  - Realizes
  - Define operational goals that contribute to the realization of the business strategy

- **Organizational Business Processes**
  - Determines
  - Realizes
  - High-level processes in textual form: input, output, expected results, dependencies
Organizational BP
(manufactoring company)
Structure of High-Level Organizational BP

Stakeholders = partners + customers + personnel + experts + ...

Business Strategy

influences decisions

Business Process Management - Organizational Level

Innovation Process

Product Planning process

Product Development Process

Warehouse Management Process

Marketing Process

Aftersales Process

Enable and support larger units of work

Information Systems

Organizational BP
(manufactoring company)

Business Strategy

influences decisions

Business Process Management - Organizational Level

- Management
- Organization
- Controlling

influences

- Innovation Process
- Product Planning process
- Product Development Process
- Warehouse Management Process
- Marketing Process
- Aftersales Process

influences

Optimization

enable and support larger units of work

Information Systems
Influences

Management+Organization => BP identification
Management+Organization => CPO selection
Management+Organization => resp. selection
Management+Organization => roles selection

Controlling => is the BP efficient?
Controlling => are business goals met?
Controlling => KPI selection and measurement (e.g. response time, error-rate, cost saving)

Controlling+Optimization => BP improvements
Organizational process

Innovation process
Conception + Implementation + Marketing

Conception input: Requirement analysis
Conception output: Project planning

Implementation input: Plan
Implementation output: Pilot application

Marketing input: Prototype
Marketing output: Market launch
# Organizational process

Top-level: Form-based description of organizational business process  
(black-box view, internal structure not shown)

<table>
<thead>
<tr>
<th>Process Name:</th>
<th>Product Development Process</th>
<th>Responsible Process Manager: Dr. Myers</th>
</tr>
</thead>
<tbody>
<tr>
<td>From:</td>
<td>Requirements</td>
<td>To: Rollout</td>
</tr>
<tr>
<td>Process Inputs:</td>
<td>Requirements Document, Project Plan, Budget Plan, Prototypes</td>
<td>Type: Development Project</td>
</tr>
<tr>
<td>Process Results:</td>
<td>Integrated and completely tested innovative product with complete documentation</td>
<td>Customer Processes:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer Processes:</td>
</tr>
</tbody>
</table>

Order Management Process, After-Sales Service Process
Intra-organizational process

No interaction with business processes performed by other parties (single organization processes)

Primary focus:
streamlining of internal processes,
eliminating activities that do not provide values,
allocating activities to persons who are competent and skilled enough

Orchestration!
Inter-organizational process

Business-to-business process, value system (multiple organizations)

Primary focus: communication aspects, legal matters, interoperability of heterogeneous software infrastructures

Choreographies!
Levels of business processes

Business Strategy
- determines
- realize

Operational Goals
- determine
- realize

Business Strategy
- long-term company strategies
  - to develop sustainable success in the market

Organizational Business Processes
- high-level processes in textual form:
  - input, output, expected results, dependencies

Operational Business Processes
- define operational goals that
  - contribute to the realization of the business strategy

Informal & semiformal techniques:
- plain text + diagrams + forms-based

BPM level
- activities and relationships are specified,
  - but implementation aspects are disregarded
Repetitive vs collaborative

Highly repetitive processes, fully automated, no human involvement: process automation can pay off (e.g. online airline ticketing)

On the opposite, for rarely enacted processes it is questionable if the effort of modeling can pay off (e.g. vessel design: cost per instance too high)

Collaborative business processes, low degree of repetition, involved persons are at the centre of attention: allow to track relationships (human activities, no cost for automation)
Operational business processes design: Guidelines
Guideline #1

Recursively:
Collect observations
Classify information
Validate findings with stakeholders
Refine artefacts
Guideline #2

Gather information (in textual format) about the business process environment, including project goals, project team and legislative regulations

Prepare a domain ontology to fix a common understanding of terms and concepts in the application domain
Guideline #3

Represent the (textual) gathered information as business process model(s)

Exploit the model as a communication basis to consolidate findings and improve the organizational/technical environments (e.g., acquire new skills, move to service-orientation)
Rules for identifying business processes

1 - who is the customer?
Each business process starts and ends with a customer who requests a product and who receives the product as a result of the business process

(remind that a customer can be internal to the organization, e.g. a department)
Rules for identifying business processes

2 - who is the owner?

*Each business process is assigned a process owner, who is responsible for the process*

(individual in charge of making sure that process instances are conducted correctly and that business goals are met)
Rules for identifying business processes

3 - which tasks?
Each business process comprises a set of activities needed to realize the business goals.
Rules for identifying business processes

4 - which dependencies?
Execution constraints are used to order activities in the business process in a way that enterprise resources are used efficiently and at the same time the business goals are met

(process orchestration language are used to express process execution constraints)
Guideline #4

**Select** the platform on which the business process will be enacted and possibly **enhance** the process model with additional information to make it executable.

It can be a technological platform but also a non-technical one (e.g., written business policies, manual procedures, service-oriented architecture)
Levels of business processes

- **Business Strategy**: long-term company strategies to develop sustainable success in the market
- **Operational Goals**: define operational goals that contribute to the realization of the business strategy
- **Organizational Business Processes**: high-level processes in textual form: input, output, expected results, dependencies
- **Operational Business Processes**: activities and relationships are specified, but implementation aspects are disregarded
- **Implemented Business Processes**: executable/technical/organizational environments (from written policies and procedures to enactment platforms)

Informal & semiformal techniques: plain text + diagrams + forms-based

BPM level

Architecture & Sw level