Extending the EPC and the BPMN with Business Process Goals and Performance Measures

Birgit Korherr and Beate List
Women's Postgraduate College for Internet Technologies
Institute of Software Technology and Interactive Systems
Vienna University of Technology
korherr@wit.tuwien.ac.at, http://wit.tuwien.ac.at
Theory about Business Processes

- **Definition:** „A business process is a group of tasks that together create a result of value to a customer. [Hammer96]

- Its purpose is to offer each customer the right product or service, e.i., the right deliverable, with a high degree of performance measured against cost, longevity, service and quality.“ [Jacobson et al., 96]

- **Process goals** and **performance measures** are available in process theory

- **BUT:** visibility in conceptual Business Process Modeling Languages (BPMLs) is not available!
Motivation Example

- Goals?
- Cycle Time?
- Quality?
- Costs?
Goals of the Extension

- Current **BPMLs** [List et al., 2006] **do not provide** explicit **notation elements** for process goals and their measures
  - E.g. designer has no possibility to integrate time limits

1. **Enhancing the expressiveness** one of the most widely-used BPMLs, namely the Event-Driven Process Chain (EPC) and the Business Process Modeling Notation (BPMN) by deriving metamodels for both,

2. **Extending their metamodels** with business process goals and performance measures to make them conceptually visible.

- Time
- Quality
- Costs
- Goals
Contribution of the Extension

- **Modelling of goals** and **performance measures** allow
  - to **structure process design**,  
  - to better understand the broader **implication of the process design**

- **Performance measures** quantify business process goals and thus help
  - to **evaluate the process design** and the **operating process**

- The extended EPC and BPMN make the **evaluation criteria** for a business process **conceptually visible**
Outline

- The Generic Metamodel Extension
- The Metamodels of EPC and BPMN - extended with Goals and Performance Measures
- Examples
- Conclusion
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The Generic Metamodel Extension

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The Generic Metamodel

- Quality is responsible for measuring the quality of a business process instance and determining success goals and failures.
- Measure is responsible for the concrete quantification of different goals and measuring the performance of a business process.
- Cost represents the expenses a business process requires, for instance, for its execution.
- Cycle time presents a time-based measure and defines the processing duration of a business process instance.
- Working time presents the actual time a business process instance is being executed by a role.
- Waiting time shows the time the process instance is waiting for further processing.
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Examples

Conclusion
Example BP, 1st Hierarchy Level

Goals

EPC

BPMN

Time

Cost

Quality

Goals

EPC

BPMN
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Conclusion
Conclusion of the Extensions of EPC and BPMN

- **EPC as well as BPMN...**
  - belong to the most well-known languages
  - but both are not able to represent performance measures

- **Developing metamodels of both languages to ...**
  - ... integrate business process goals and
  - ... performance measures

- **This work provides** an explicit illustration of the performance measures
  - time,
  - cost, and
  - quality in both languages

- **These extensions ...**
  - better illustrate the requirements of a certain business process
  - and enhance the expressiveness of the models
Related Work 1/2

- **Previous work [Korherr et al., 06]** presents
  - a UML 2 profile based on Activity Diagrams for integrating business process goals and performance measures
  - and a mapping to BPEL

- **[Neiger et al., 04]** established links between EPCs and its additional goals with the “value focused thinking framework” (VFT)
  - want to solve the problem that business process management frameworks do not meet the requirements of goal-oriented business process modeling
  - do not focus on the measurement of goals
[Andersson et al., 05] developed a formal definition of goal-oriented business process patterns
- Approach is very high level, the authors did not focus on a specific business process modelling language

[Aguilar et al., 06]: developed a set of measures to evaluate the structural complexity of business process models on the conceptual level
- use the Business Process Modeling Notation (BPMN)
- focus lies on measuring the core elements of BPMN
References


Example BP, 2nd Hierarchy Level

**EPC**

- Assertion of the Claim
- Compensation of the Claim
- Financial Claim Specialist
- Claim Administrator

**BPMN**

- Assertion of the Claim
- Compensation of the Claim
- Cycle Time ≤ 1 day
- Cycle Time ≤ 3 days

Organisational Role

Time