

Guidelines of Business Process Modeling

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Abstract. Process modeling becomes more and more an important task not only for the purpose of software engineering, but also for many other purposes besides the development of software. Therefore it is necessary to evaluate the quality of process models from different viewpoints. This is even more important as the increasing number of different end users, different purposes and the availability of different modeling techniques and modeling tools leads to a higher complexity of information models. In this paper the Guidelines of Modeling (GoM)¹, a framework to structure factors for the evaluation of process models, is presented. Exemplary, Guidelines of Modeling for workflow management and simulation are presented. Moreover, six general techniques for adjusting models to the perspectives of different types of user and purposes will be explained.

1 Complexity and Quality of Business Process Models

The popularity of different process management approaches like Lean Management [58], Activity-based Costing [52], Total Quality Management [21, 35], Business Process Reengineering [16, 17], Process Innovation [7, 8], Workflow Management [14], and Supply Chain Management [39] has two main effects concerning the requirements on process models. First, the number and variety of model designers and users has spread enormously. Especially, representatives from various business and technical departments, who are not necessarily modeling experts are increasingly involved in the design of process models. As a consequence, the understandability of process models is of growing importance. Secondly, the number and variety of

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purposes process models are used for is growing. Besides the "traditional" use of process models within software engineering these models are more and more used for pure organizational purposes like process reorganization, certification, Activity-based Costing or human resource planing (see as well [37]).

Process modeling is supposed to be an instrument for coping with the complexity of process planning and control. Existing models show as well considerable complexity themselves, though. Hence, the *design* of process models often turns out to be very problematic. It has direct influence on the economic efficiency of the underlying process-related project. In the first place the model design requires personnel resources and (if necessary) the purchase of software tools. Moreover, the risk exists that the process models, referring to their purpose, are not sufficient. For example, semantic mistakes or the disregarding of relevant aspects can lead to possibly expensive misjudgments. Consequently, the design of models always is an economical risk and not only a modeling exercise.

Especially in enterprise-wide process management projects the design of integrated process models can become a comprehensive challenge. The number of process models can easily be higher 500 with five or more different levels. The related risk will be increased if the model design is seen as a domain of "modeling specialists" who are supposed to be the only ones who understand "their" models. In contrast to this, a business process model should serve as a communication base for *all* persons involved. Consequently, the quality of process models can beyond the fulfillment of syntactic rules defined as its "fitness for use".

Within this context a framework called *Guidelines of Modeling (GoM)* has been developed to assure the quality of information models beyond the accordance to syntactic rules. The GoM-framework includes six guidelines, which aim to improve the quality of information models (product quality) as well as the quality of information modeling (process quality). The *design of business process models* is one core field within the project.

This paper describes first the general intention and the framework of the Guidelines of Modeling (section 2). Exemplary, Guidelines of Modeling for workflow management and simulation, two main purposes of process modeling, are discussed in the third section. Section 4 presents six different techniques for the adaptation of models to perspectives of different users and purposes. The paper ends with a brief conclusion.

2 The Guidelines of Modeling (GoM)

Various frameworks for quality assurance of information models were already presented. Usually, they are either focussing only one kind of information models, in particular data models (like the approaches from [1] or [31, 32]), they focus only special requirements [2, 59], or they contain such high-level-statements, that it is difficult to derive useful recommendations for modeling projects [24, 27].

The aim of the Guidelines of Modeling (GoM) is the development of specific design recommendations in order to increase the quality of models beyond the