Chapter VI

An Analytical Evaluation of BPMN Using a Semiotic Quality Framework

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ABSTRACT

Evaluation of modelling languages is important both to be able to select the most suitable languages according to the needs and to improve existing languages. In this chapter, business process modeling notation (BPMN) is presented and analytically evaluated according to the semiotic quality framework. BPMN is a functionally oriented language well suited for modeling within the domain of business processes, and probably general processes outside of the business domain. The evaluation indicates that BPMN is easily learned for simple use, and business process diagrams (BPDs) are relatively easy to understand. Tools can fairly easily map BPDs into the Web Services Business Process Execution Language (WS-BPEL) (formerly known as BPEL4WS) format, but executable systems then require creation of Web services representing the activities in BPDs. An evaluation according to the Bunge-Wand-Weber (BWW) ontology is useful for finding ontological discrepancies, and the semiotic framework is useful for evaluating quality on a relatively general level. Thus, these methods complement each other.
INTRODUCTION

Currently there exist a large number of different modelling languages. Many of them define overlapping concepts and usage areas, and consequently it is difficult for organizations to select the most appropriate language related to their needs. Traditionally, the research community has focused more on creating new modelling languages than evaluating existing ones. However, evaluation of languages is important both to be able to select the most suitable ones and to improve existing languages.

Conceptual modelling languages can be evaluated analytically and empirically. As Gemino and Wand (2003) discuss, analytical and empirical analyses of modelling techniques complement each other. We can also distinguish between analyses of single languages and comparative analyses of several languages. In this chapter, we present business process modelling notation (BPMN) and perform an analytical evaluation of the quality of BPMN according to the semiotic quality framework (Krogstie, 2003; Lindland, Sindre, & Sølvberg, 1994). We also discuss how an analytical evaluation according to the Bunge-Wand-Weber (BWW) ontology may be performed as a complement to this evaluation.

In the next section, we present BPMN and its notation, providing some examples of business process diagrams (BPDs) and relating BPMN to the Web Services Business Process Execution Language (WS-BPEL). The subsequent section presents the semiotic framework, divided into parts for evaluating the quality of conceptual models and the quality of conceptual modelling languages. An analytical evaluation of BPMN according to the semiotic framework is then discussed, followed by a short summary of what the BWW ontology is, how it may be used to evaluate conceptual modelling languages, and in what ways this can complement the evaluation according to the semiotic framework. We then discuss related work, present suggestions for future work, and finally, our conclusion.

BUSINESS PROCESS MODELLING NOTATION

Overview

Business process modelling notation (BPMN) is a notation aiming to be easily understandable and usable to both business users and technical system developers (White, 2004). It also tries to be formal enough to be easily translated into executable code. By being adequately formally defined, it can create a connection between the design and the implementation of business processes.

BPMN defines business process diagrams (BPD), which can be used to create graphical models especially useful for modelling business processes and their operations. It is based on a flowchart technique — models are networks of graphical objects (activities) with flow controls between them.

The BPMN 1.0 specification was developed by the Business Process Management Initiative (BPMI) and was released in May 2004. BPMN is based on the revision of other notations and methodologies, especially unified modeling language (UML) activity
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