



Chapter XIII

Evaluation of Selected Enterprise Reference Models

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Abstract

This chapter describes a comprehensive evaluation of ten enterprise reference models, including the models underlying the two leading ERP systems (SAP and Baan) and a number of prominent data model libraries. The main purpose of the chapter is to explore how well various model evaluation criteria and the associated metrics can be applied to real-life enterprise models. The analysis is structured into syntactic, semantic and pragmatic criteria. Not all criteria can be measured using clear or unambiguous metrics and some novel, exploratory approaches are suggested. The chapter does not only provide an insight in how some of the better-known enterprise models compare against each other; but it also highlights the many practical problems and issues encountered with applying evaluation criteria to industrial-strength models.

Introduction

The importance of enterprise reference models is growing thanks to the increasing adoption of CASE tools as well as the demand for enterprise information architectures to support more integrated, agile systems and enterprise-wide data warehouses.

This trend is reflected in an ever-increasing number of modeling methodologies and tools. But, while there is a significant body of literature available on the evaluation of modeling tools and methodologies, far less has been published on actual evaluation of the *output* from these methodologies, namely how to actually evaluate specific reference models. While the importance of assessing the quality of a methodology is not questioned, it is abundantly clear from industry experience that employing a good modeling technique, tool or process does not necessarily guarantee the production of a quality reference model. Thus, when evaluating competing reference models, the practitioner is often left in limbo looking for an appropriate and suitable set of evaluation criteria.

This chapter, therefore, applies a comprehensive set of model quality metrics which have been proposed in the literature to a selection of ten published enterprise reference models in an attempt to explore the practical issues that arise if one uses the various model evaluation metrics which have been suggested in the literature for comparing real-world reference models. Not all evaluation criteria attempt to measure quality; model size, cost or the degree of overlap between models are important evaluation criteria but have little or no direct bearing to model quality.

The focus in this chapter is on *static* models. However, parallel but independent research has developed a similar framework to evaluate dynamic models (Taylor & Sedera, 2003). Also, this chapter concentrates on the evaluation of enterprise reference models, but much of the analysis should be equally applicable in *other modeling domains*, such as embedded systems or specific functional areas within the enterprise. Finally, note that this chapter uses the term “validity” fairly loosely. However, Van Belle (2003) gives a more detailed discussion of the different types of validity and how they apply to the metrics used in the framework.

Prior Work and Analysis Framework

Prior Work on Evaluation of Models

Research on the evaluation of models and similar conceptual structures can be found in a number of different reference disciplines, such as software engineering, ontology research, methodology engineering and enterprise reference architectures. Most researchers simply provide an unstructured sequential list or table of model evaluation criteria (e.g., Benyon, 1990; Claxton & McDougall, 2000; Halpin, 2001) without supplying sound arguments for the completeness of their lists.

Other researchers organise their evaluation criteria into comprehensive frameworks. Most of these frameworks are found in context of evaluating the *quality* of modeling approaches and methodologies (e.g., Khaddaj & Horgan, 2004; Brazier & Wijngaards, 1998). Perhaps

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