

Chapter X

Towards a Holistic Approach to Validating Conceptual Models

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Abstract

The chapter sketches a holistic approach to semantically validating conceptual models. The quality and thus the validation of conceptual models are of high economic importance. However, only little empirical work has focused on their evaluation so far. This raises the question whether a holistic approach to determining the quality of conceptual models is available yet. In order to

describe the current state of research and to expose the so far neglected research fields we develop a two dimensional framework. With the help of this framework we can identify a notable shortcoming on conceptual model evaluation. We can show that there is actually no approach that covers all aspects of the framework. Hence, we describe a procedure model that integrates different evaluation techniques. This procedure model provides a starting point to further elaborate on a holistic evaluation approach.

Introduction

Since mid of the 70's, conceptual models have been employed to facilitate and systematize the process of information systems engineering (Boman, Bubenko, Johannesson, & Wangler, 1997). A remarkable number of modeling languages and methods have been proposed aiming at a more efficient and effective software development (Mylopoulos, 1998; Söderström, Andersson, Johannesson, Perjons, & Wangler, 2002; Yair Wand, Monarchi, Parsons, & Woo, 1995). In the beginning of the 90's, accompanied by new findings in management science, the positive experiences with conceptual models were transferred from information systems engineering to organizational design. This established conceptual models as a widely-used mean for eliciting costumer requirements and documenting the project progress of a software system as well as for describing the business processes and corporate structures in an organization (Shanks, Tansley, & Weber, 2003).

The quality of conceptual models has gained an immense impact on other IT artifacts (Hevner, March, Park, & Ram, 2004; March & Smith, 1995). Software systems are often based on requirement specifications in form of conceptual models. The adequacy of these specifications with regard to the represented application domain determines the acceptability and usability of software systems (Lauesen & Vinter, 2000). An incorrect description of the application domain will lead to problems in the implemented software system and to delays in the project progress. Likewise, the success of a reorganization project is influenced by the adequacy of the underlying organizational models. A problem analysis based on faulty models can lead to wrong and in the end very cost intensive decisions. By this means, the quality of conceptual models has reached a high economic importance.

The scientific and practical significance of conceptual models obliges to engage in the evaluation of these artifacts. During the last years numerous research efforts have been undertaken in order to develop criteria catalogs to

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