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Chapter I

Perspectives on Reference Modeling

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Abstract

Conceptual models play an increasingly important role in all phases of the information systems life cycle. For instance, they are used for business engineering, information systems development and customizing of enterprise resource planning (ERP) systems. Despite conceptual modeling being a vital instrument for developing information systems, the modeling process often is resource consuming and faulty. As a way to overcome these failures and to improve the development of enterprise-specific models, the concept of reference modeling has been introduced. A reference model is a conceptual framework and may be used as a blueprint for information systems development. In this chapter, we seek to motivate research on reference modeling and introduce the chapters of this book on using reference models for business systems analysis. Our discussion is based on a framework for research on reference modeling that consists of four elements: reference modeling languages, reference modeling methods, reference models and reference modeling context. Each element of the framework is discussed with respect to prior research, the contributions of chapters in this book and future research opportunities.

Motivation

Within the information systems discipline, conceptual modeling aims at building some kind of formal representation of a modeling domain (Frank, 1999; Mylopoulos, 1998; Scheer & Hars, 1992; Wand & Weber, 2002). Conceptual models, which are often graphically represented, are used to grasp both static and dynamic aspects of a particular discourse world. They play an increasingly important role in activities such as business engineering (Scheer, 1998a, 1998b), information systems development (Winter, 1994) and customizing of enterprise resource planning (ERP) systems (Rosemann, 2003b). Despite conceptual modeling being a vital instrument for developing information systems, the modeling process is often resource-consuming and faulty. As a way to overcome these failures and to improve and accelerate the development of enterprise-specific models, the concept of reference modeling has been introduced (Mertins & Bernus, 1998; Mišic & Zhao, 2000; Scheer & Nüttgens, 2000; Schütte, 1998).

A reference model is a model representing a class of domains (Fettke & Loos, 2003a, pp. 35-36). It is a conceptual framework that can be used as a blueprint for information system development. In order to be able to use reference models, they must be adapted to the requirements of a specific enterprise. Reference models are also called universal models, generic models or model patterns. Concrete examples of reference models are (e.g., SAP's reference model, Keller & Teufel, 1998), Hay's (1996) data model patterns or Scheer's (1994) reference model for production planning and control systems.

Although the ideas of reference modeling can be traced back to at least the 1930s (Thomas, 2005, p. 18), research on reference modeling has become quite popular in Germany in the 1990s. For instance, in February 2006, the conference "Referenzmodellierung" (this term is the German word for "reference modeling") was held for the ninth time. More than 50 papers have been published in the proceedings of this conference. However, today's reference modeling research is mainly conducted in Germany, as can be seen by two library searches: More than two hundred books on reference modeling are catalogued by "Die Deutsche Bibliothek" (German National Library, see Figure 1; the search was conducted on February 2, 2006, using the search string "referenzmodell*"). In comparison, in the catalogue of the Library of Congress, only 11 titles can be found on the topic (the search was conducted on February 2, 2006, using the search string "reference model*").

One reason for the tremendous interest in reference modeling in Germany may be that worldwide leading German information technology enterprises made extensive use of reference models. For example, SAP, the world's leading ERP developer, decided in the early 1990s to describe their software packages with reference models. The reference models developed were used by SAP as a marketing instrument to penetrate the American market for client/server ERP systems (Ricciuti & Semich, 1993). The IDS Scheer AG, a software and consulting company that developed the ARIS Toolset, is another leading enterprise. The ARIS Toolset is a worldwide leading business process modeling tool, which is very often used for reference modeling. Additionally, IDS Scheer AG developed several reference models for different industries, which are used by consultants in projects (Reiter, 1999).

These two examples demonstrate that reference modeling is relevant for all businesses worldwide. Since reference modeling has such a potential for effective and efficient business

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