Chapter X

Conceptual Modeling for XML:
A Myth or a Reality

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Abstract

The process of conceptual design is independent of the final platform and the medium of implementation, and is usually in a form that is understandable and usable by managers and other personnel who may not be familiar with the low-level implementation details, but have a major influence in the development process. Although a strong design phase is involved in most current application development processes (e.g., Entity Relationship design for relational databases), conceptual design for XML has not been explored significantly in literature or in practice. Most XML design processes start by directly marking up data in XML, and the metadata is typically designed at the time of encoding the documents. In this chapter, the reader is introduced to existing methodologies for modeling XML. A discussion is then presented comparing and contrasting their capabilities and deficiencies, and delineating the future trend in conceptual design for XML applications.

Introduction

With advances in the structural and functional complexity of XML, a standardized method for designing and visually presenting XML structures is becoming necessary.

XML modeling techniques can be generally classified based on the chosen approach into one of the following three major categories: (1) Entity Relationship (ER), (2) Unified Modeling Language (UML), and (3) Structured Hierarchical Model. Literature reveals the existence of several methodologies for modeling XML that are derived from these three categories. Several proprietary commercial tools that can be adapted to design and model XML structures have been introduced in recent years. In this chapter, we present six such academic tools and four commercial methodologies relevant in modeling XML structures and provided an overview of the same is provided by making use of appropriate examples. In order for the survey to be more comparative, a common working example is chosen and equivalent conceptual models are developed to illustrate a model's capabilities. To conclude, a discussion summarizing the capabilities of each of the methods and their suitability as a conceptual model for XML is analysed to help answer the question posed by the chapter: *Is developing a conceptual model for XML a Myth or a Reality?*

Several business situations arise where a conceptual model is necessary. A good conceptual model can help planners by providing a framework for developing architectures, assigning project responsibilities, and selecting technology (Mohr, 2001). For XML in particular, the verbose and syntax-heavy nature of the schema languages makes them unsuitable for providing this type of framework. As an illustration, consider the typical business problem of data interchange between different organizations. These type of applications, often used with the term EDI (Electronic Data Interchange), is already being moved to XML (Kay, 2000; Ogbuji, 1999). The non-proprietary nature of XML and its descriptive markup make it suitable for exchange of information between organizations. Ogbuji (1999) uses a purchase order example to illustrate how the interchange process can be facilitated with XML. However, a quick look at the illustration reveals that XML data and structure syntax, although more generalized and more descriptive than the EDI notation used by the article (ANSI X12 Transaction set), it is not going to be suitable for use in the presentation of the data to its potential users. A conceptual model of this purchase order, shown in Figure 1, reveals the internal structure of the order and items, and is more suited for understanding the conceptual structure of the application, and this is exactly the aim of this chapter.

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