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Chapter X

A Twofold Approach for Evaluating Inter-Organizational Workflow Modeling Formalisms

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Abstract

This chapter presents a twofold methodology for the evaluation of inter-organizational workflows modeling formalisms. The first approach is ontological and based on the Bunge-Wand-Weber models. The second is based on prototyping and consists in the development of a WFMS for language evaluation. The dual evaluation methodology is then applied to the UML with a practical example from the aerospace industry. Both convergent and divergent results are found from the two validations.

Possible enhancements to the UML formalism are suggested from the convergent results. On the other hand, the divergent results suggest the need for a contextual specification in the BWW models.

Introduction

Transactions have been traditionally managed either through organizations or through markets. With advances in electronic commerce and in information systems, this distinction is getting blurred. For example, the last years have seen the development of electronic intermediaries, also known as electronic market-places (e-marketplaces), which aim at concentrating transactions made within, or across, industrial sectors through a limited number of virtual intermediaries. These virtual markets enhance transactional efficiency through the aggregation of trading partners (Lucking-Reiley & Spulber, 2001) and through a reduction in asymmetrical information.

It is clear that electronic business has penetrated business to business (B2B) processes and consequently spurred a transformation of the traditional organizational boundaries (Zwass, 1998). Since technology has made possible the participation of several partners in shared business processes, these have been crossing organizational boundaries to an extent never experienced before (van der Aalst, 2000).

Research on inter-organizational workflow technology is facing an important problem. It has essentially focused on technical issues and has almost ignored language structure (van der Aalst, 2000). This is a classical case of a "technology seducer" problem, very present in the Information Systems (IS) discipline, which has been criticized by Weber (1997).

This chapter assesses the adequacy of the unified modeling language (UML) for inter-organizational business processes. There is no question that having adequate language structures for representation is a fundamental requirement for adequate development. The evaluation methodology is based on ontology, using Wand and Weber's models (1990), and prototyping. Since little empirical validation work has been done on Wand and Weber's models, ontological analysis will be combined with a prototypical validation that will consist in comparing the process language used in a workflow management system to the process language used for modeling business processes. By combining the two approaches, convergent results are expected to be found to validate the language.

The chapter is organized as follows. First, workflows are defined. Then, a literature review is presented to introduce the ontological evaluation framework

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