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Chapter I

Ontological Analysis of Business Systems Analysis Techniques:
Experiences and Proposals for an Enhanced Methodology

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Abstract

For many years in the area of business systems analysis and design, practitioners and researchers alike have been searching for some comprehensive basis on which to evaluate, compare, and engineer techniques that are promoted for use in the modelling of systems' requirements. To date, while many frameworks, factors, and facets have been forthcoming, most of them appear not to be based on a sound theory. In light of this dilemma, over the last 10 years, attention has been devoted by researchers to the use of ontology to provide some theoretical basis for the advancement of the business systems modelling discipline. While the selected ontologies

are reasonably mature, it is the actual process of an ontological analysis that still lacks rigour. The current procedure leaves room for individual interpretations and is one reason for criticism of the entire ontological analysis. This chapter proposes an enhanced procedural model for the ontological analysis based on the use of meta-models, the involvement of more than one coder and metrics. This model is explained with examples from various ontological analyses.

Introduction

As techniques for conceptual modelling, enterprise modelling, and business process modelling have proliferated over the years (e.g., Olle et al., 1991), researchers and practitioners alike have attempted to determine objective bases on which to compare, evaluate, and determine when to use these different techniques (e.g., Karam & Casselman, 1993; Gorla, Pu, & Rom, 1995). Throughout the 80s, 90s, and into the new millennium, however, it has become increasingly apparent to many researchers that without a theoretical foundation on which to base the specification for these various modelling techniques, incomplete evaluative frameworks of factors, features, and facets would continue to proliferate. Furthermore, without a theoretical foundation, one framework of factors, features, or facets is as justifiable as another for use (e.g., Bansler & Bodker, 1993).

Ontologies and ontological engineering have received much attention in the business systems analysis and design literature over the last decade. Ontology is a well-established theoretical domain within philosophy dealing with identifying and understanding elements of the real world and their meaning. Given that IS professionals create computer systems that depict a portion of the real world, IS professionals might look to ontology to provide the conceptual underpinning that has been missing for so long from the IS modelling discipline.

Wand and Weber (1989, 1990a, 1993, 1995) have adapted an ontology proposed by Bunge (1977) in order to provide a foundation for understanding the process in developing an information system. A popular application area of this ontology has been conceptual modelling. Today however, interest in, and the applicability of, ontologies extend to areas far beyond modelling. As Gruninger and Lee (2002) point out, "a Web search engine will return over 64,000 pages given 'ontology' as a keyword … the first few pages are phrases such as 'enabling virtual business', 'gene ontology consortium' and 'enterprise ontology'" (p. 13). The usefulness of ontology as a theoretical foundation for knowledge representation and natural language processing is a fervently debated topic at the present time in the artificial intelligence research community (Guarino & Welty, 2002).

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