

Chapter 2

Conjoint Analysis and Design of Business and IT: The Case for Multi-Perspective Enterprise Modeling

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ABSTRACT

This chapter presents a method for multi-perspective enterprise modeling (MEMO). Enterprise modeling fundamentally aims to support the conjoint analysis of business and IT to foster their integration. MEMO expands on this general aim with a specific concern for the professional perspectives of different stakeholder groups. MEMO is based on a language architecture that comprises an extensible set of domain-specific modeling languages, each addressing one or more professional perspectives. It is supplemented by an adaptable generic framework to support high-level ‘ballpark’ views of an enterprise and to serve as a common starting point for more elaborate analysis and design tasks. MEMO also supports the construction of corresponding process models to design customized modeling methods. The chapter motivates the use of MEMO and illustrates possible use cases. It also provides a description of the method’s architecture, its DSMLs, and a tool environment that supports the development and analysis of enterprise models.

INTRODUCTION

The efficient use of information technology (IT) demands for the mutual adaptation of a company’s action system and its information system. When designing an information system for a given action system, it is important to identify and pursue opportunities to organize the action system more efficiently through IT. Yet, it is usually not a good idea to adapt the action system to a given information system, such as an

DOI: 10.4018/978-1-7998-0108-5.ch002

‘industry standard’ ERP system, because that would threaten a company’s specific profile and, hence, its competitiveness. Instead, a strategy of mutual adaptation of technology and organization is called for.

In times of the digital transformation, a company’s ability to survive depends upon its ability to continuously adapt its operations, its information system, and even its business model. This ongoing need to change poses serious challenges. Information systems and corresponding IT infrastructures are of tremendous complexity. Often, they lack the desired level of integration, flexibility, and maintainability, since they have grown over time into heterogeneous collections of software systems and related data stores. From a technological perspective, it would often be preferable to replace old legacy systems. However, from an economic perspective that is often not regarded as an option, because the risks created by such fundamental interventions can be substantial. In addition, introducing new information systems requires changing the action system, for example, by re-designing organizational structures and business processes, which is likely to face resistance from employees. In summary, business and IT are mutually interdependent, and with the continuous penetration of action systems by IT, it will be more and more difficult to draw a clear borderline between them. Accordingly, means to support the conjoint analysis and (re-)design of business and IT are urgently needed.

The idea of enterprise modeling was introduced more than thirty years ago, arising out of the recognition that the alignment of business and IT needs to be improved in many firms. Zachman, who back then was a sales representative with IBM, was one of the early proponents of enterprise modelling. Zachman wanted to develop “some kind of framework for rationalizing the various architectural concepts and specifications ... to establish credibility and confidence in the investment of system resources.” (Zachman, 1987). Zachman’s work was pioneering, but remained limited to a high-level framework. The purpose of this framework was to structure an enterprise together with its information system from various viewpoints and on different levels of detail. Many more elaborate approaches to enterprise modeling have been developed since then (ESPRIT Consortium AMICE, 1989), (Scheer, 1992), (Ferstl & Sinz, 1998), (Sandkuhl, Stirna, Persson, & Wißotzki, 2014). All these initiatives have in common that they seek to support the conjoint analysis and design of information systems through the construction and integration of specific models of an enterprise.

The evolution of the field resulted in a widely shared understanding of the term enterprise model: an enterprise model integrates at least one conceptual model of a company’s action system, e.g., a business process model, with at least one model of its information system, e.g., a data model or an object model. Alongside the term ‘enterprise model’, the term ‘enterprise architecture’ has gained remarkable popularity in the last decade (The Open Group, 2009), (Aier et al., 2009). Like enterprise models, enterprise architectures are meant to aid the conjoint analysis and design of a company’s action system and its information system, making extensive use of conceptual models. Two aspects, however, characterize enterprise architectures as a specific form of enterprise models. First, enterprise architectures typically aim at high-level representations suited for a management audience, rather than at more detailed representations suited for domain and IT experts. Second, enterprise architecture approaches are often associated with the claim to ‘engineer’ the enterprise, as is reflected in the related term ‘enterprise engineering’ (Dietz et al., 2013). While this claim promises an especially systematic and professional approach to information systems design, it is suspected by some to falsely equate social systems with formal or technical systems amenable to engineering. Despite these differences, the fundamental aim of enterprise modeling is endorsed in a wide range of instruments from academia and industry.

This chapter gives a comprehensive introduction to enterprise modeling. It is intended to provide a clear understanding of how to configure and use enterprise modeling for a wide range of problems

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