



## Chapter II

# Configurable Reference Modeling Languages

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## Abstract

*This chapter discusses reference modeling languages for business systems analysis and design. In particular, it reports on reference models in the context of the design-for/by-reuse paradigm, explains how traditional modeling techniques fail to provide adequate conceptual expressiveness to allow for easy model reuse by configuration or adaptation and elaborates on the need for reference modeling languages to be configurable. We discuss requirements for and the development of reference modeling languages that reflect the need for configurability. Exemplarily, we report on the development, definition and configuration of configurable event-driven process chains. We further outline how configurable reference modeling languages and the corresponding design principles can be used in future scenarios such as process mining and data modeling.*

## Introduction

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Business systems have evolved as computer-based information systems that present themselves as comprehensive commercial packages for the support of business requirements. Being IT-supported software solutions, they presumptively support and enhance organizations in all their business operations. First attempts towards such corporate-wide integrated information systems were developed in the 1960s (Beer, 1966). The huge success of this idea has led to the proliferation of comprehensive business information systems such as enterprise resource planning (ERP) systems or enterprise systems (ES), the current generation of which is known under the label of process-aware information systems (Dumas, van der Aalst, & ter Hofstede, 2005). This label has emerged from an act of “silent revolution” that has embraced the IS discipline over the last decades and which has started to shift the focus of attention from a data perspective towards a process perspective. As a result, an increasing number of business processes are now conducted under the governance of process-aware information systems, with the intention of bridging not only business and IT but also people and software through process-based technology.

The successful implementation of process-aware business systems is, however, dependent on a seamless alignment between the system capabilities and the organizational requirements of the enterprise. The process of aligning organizational requirements and system functionality (Rosemann, Vessey, & Weber, 2004) is known as configuration and rests on the assumption of similarity between enterprises, in the sense that generic business system functionality, with some customization, is assumed to be applicable to all enterprises in a given industry sector. Following the idea of process-orientation, business system vendors often offer their solutions in the form of pre-defined generic business processes for a set of industry sectors. Oracle, for example, offers system-supported business process solutions that cover 19 industrial sectors (Oracle, 2006) while SAP offers business process solutions for 24 industrial sectors (SAP, 2006). These industry-specific process “templates” are introduced to organizations to offer a final implementation of the business system in the form of a configured, enterprise-specific set of business processes that are enabled, enacted and supported by the system.

Yet, the act of aligning generic industry-specific with enterprise-specific business processes that reflect organizational requirements has been shown to imply extensive configuration efforts and may lead to significant implementation costs that exceed the price of software licenses by factors of five to ten (Davenport, 2000). Some instances even indicate that a misalignment may result in severe business failure if conducted badly. Consider the example of FoxMeyer, once a \$5 billion wholesale drug distributor, which filed for bankruptcy in 1996 after Andersen Consulting concluded that the insufficiently aligned SAP installation crippled the firm’s distribution (Stein, 1998). Other examples include Mobil Europe and Dow Chemical (Davenport, 1998).

Business systems vendors are aware of these problems and try to increase the manageability of the configuration process of their software solutions. One respective measure is to deliver the products along with extensive documentation and specific implementation and configuration support tools. Conceptual models play a central role within such documentation. They describe functionality and structure of the business systems on a semi-formal level and have become popular under the notion of reference models. Though such reference models for

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