

Chapter 11

Exploring Business Value Models for E-Service Design

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ABSTRACT

Contemporary enterprises face strong pressures to increase competitiveness by engaging in alliances of several kinds. In a rapidly increasing degree, traditional organizational structures evolve towards online business using modern ICT – such as the Internet, semantic standards, process- and service-oriented architectures. For efficient applications of inter-organizational information systems, the alignment between business and ICT is a key factor. At the ICT level, Web services are used as the cornerstones for modeling the interaction points of Web applications. So far, development of Web services has focused on a technical perspective, such as the development of standards for message exchanges and service coordination. Thereby, business concepts, such as economic values exchanged among the cooperating actors, cannot be traced in Web service specifications. As a consequence, business and ICT models become difficult to keep aligned. To address this issue, the authors propose a MDA-based approach for design of software services which may be implemented using Web services and Web service coordinations. The proposal focuses on a value-explorative analysis and modeling of business services at the CIM level, and model transformations using UML 2 to the PIM level, by utilizing well-defined mappings.

INTRODUCTION

Since the emergence of the Internet, enterprises have opened their core functions to customers, suppliers, business partners and financial institutions. The intensive growth of World Wide Web has

created opportunities for all kinds of enterprises to make their value offerings available to consumers as software services (i.e. e-services). An example of this is the proliferation of bookstores on the Web that let Internet users browse their catalogues, place orders, and make payments.

A problem common to actors participating in such collaborations is to identify what offerings

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they should make available as e-services for others. Business collaborations can be described using business models. A business model is made in order to make clear who the actors are in a business scenario and explain their relations, which are formulated in terms of *economic values* exchanged between the actors. Thereby, business models capture the relations between actors, and the events that result in the creation and distribution of the values among the actors.

From the technical perspective, Web services have become a common technology for modelling interactions of Web applications. So far, development of Web services has focused on structural and operational aspects. Designing applications directly to these perspectives is tedious, error prone, and business functionality remains invisible. We need to design service-oriented applications from a higher-level of abstraction to get the needed business perspective, and also make programming more productive by automating the generation of low-level technology solutions. Raising the level of abstraction to separate business specifications from implementation details is a well-established trend in system development and is one of the main goals of MDA, Model Driven Architecture (Kleppe et al., 2003).

MDA is proposed by the Object Management Group (OMG) as an approach for system development that separates business and application from the underlying platform technology. MDA guides architects and developers to define formal models at different levels of abstraction and create transformations among them. The MDA process typically involves the creation of three different types of models. Computational Independent Model (CIM) is used to describe business level information, independent of technology considerations. This model is further refined to a Platform Independent Model (PIM), which specifies a high-level design of an IT system. Finally, the PIM is transformed into a Platform Specific Model (PSM), which adds the technology details necessary for implementation on a specific

software platform. MDA follows the traditional development phases, as promoted earlier by RUP, Rational Unified Process (Kruchten, 1998), i.e. modeling of business and system requirements, system analysis, design, coding, and so forth. The two major differences from the MDA perspective, concern a shift from object composition to model transformation, and a new type of artifacts, which are based above all on formal models. Thus, when a technology changes, it is not needed to change the business specification (i.e. CIM); instead, the new technology model (PSM) can be created from the system model (PIM). In this way, each model is preserved as a product gate.

One of the major issues in the MDA discipline is the choice of model types to be used for CIMs and PIMs. In this chapter, we explain how business value models can be used at the CIM level, to provide a clear and a declarative foundation for identifying business services of an enterprise. Exploring a business model across a whole collaboration lifecycle, i.e. starting from planning to post-actualization, enable us to describe an entire enterprise-wide service portfolio within CIM. At the same level, process models are used to describe the service behavior. To enable mapping of the elicited business services further to e-services at the PIM level, we rely on the use of UML profiles that provide a standard way to set a model focus on a specific architectural style, such as in this case – service-oriented. Conceptualized in this way, the method that we propose is capable to support integration and alignment of economic value propositions of the collaborating business actors with the ICT realizations created using Web services. The method has a practical relevance for exploring the enterprise models in more depth from the business perspective, in order to identify e-services and design systems accordingly.

The chapter is structured as follows. Next section introduces business value models, and gives a brief overview of process modeling. In the section after, our MDA-based method for e-service identification and description is explained

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