

## Chapter 4

# Using Business Value Models to Elicit Services Conducting Business Transactions

**Tharaka Ilayperuma**  
*University of Ruhuna, Sri Lanka*

**Jelena Zdravkovic**  
*Stockholm University, Sweden*

### ABSTRACT

*Traditional organizational structures evolve towards online business using modern IT – such as cloud computing, semantic standards, and process- and service-oriented architectures. On the technology level, Web services are dominantly used for modeling the interaction points of complex Web applications. So far, development of Web services has matured on the technical perspective considering for example the development of standards for message exchanges and service coordination. However, business concepts, such as economic assets exchanged in transactions between cooperating actors, cannot be easily traced in final Web service specifications. As a consequence, business and IT models become difficult to keep aligned. To address this issue, the authors propose an MDD approach to elicit business services and further software services using REA business model as the starting point. The proposal focuses on a value-explorative elicitation of business services at the top level and model transformations using UML 2 to the system 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 the actors participating in such collaborations is to identify what offerings they should make available as software services for others. Business collaborations between

DOI: 10.4018/978-1-4666-6359-6.ch004

stakeholders of business value constellations 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 or more precisely, *business transactions* occur between actors. Thereby, business models capture the business transactions between actors, and the events that result in the creation and distribution of the values among the actors.

Model Driven Development (MDD) provides a basis for the alignment between business and IT by promoting the role of models and automatic creation of code by predefined model transformations. Current Web service solutions have succeeded in aligning with business processes enabling thus loosely-integrated and reusable task automations – here, the business information is captured on a procedural, that is, tactical level.

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. 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 which is a particular Model Driven systems development approach in MDD paradigm (Kleppe et al., 2003). One of the major issues in the MDA discipline is the choice of model types to be used on different levels of abstraction. According to (Loniewski et al., 2010), majority of existing proposals do not use business requirements as the starting point. They also argue that those who even consider business requirements do not use them exclusively to describe business requirements in Model Driven Development (MDD) contexts and thereby to serve as the inputs for model-driven transformation process.

In this chapter, we explore the capability of business value models to elicit a portfolio of business transactions at the computational independent, *i.e. business level*. Further exploring such business transactions across a whole collaboration lifecycle, *i.e. starting from planning to post-actualization*, enable us to elicit an entire enterprise-wide service portfolio within the business level. At the same level, process models are used to describe the service behavior. To enable mapping of the elicited business services further to software services at the system level, we rely on the use of UML profiles as a structured way to set a model's 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 Information Systems (IS) 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 software services and design systems accordingly.

To facilitate the outlined business orientation in a model-driven Web service engineering, we have identified two important needs:

- *To use adequate service models and modelling frameworks.* Services exist in collaborative business environments, and as such they should be conceptualized accordingly.
- *To enable binding of business and software service-oriented system models more precisely and unambiguously.* Models can be of different abstraction levels, and thereby facilitating correct propagation of model information from higher to lower abstraction level is required.

Following the outlined concerns, in this paper, we propose a MDD method for elicitation and design of business-driven Web services. The method is based on the use of two models at,

25 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/using-business-value-models-to-elicit-services-conducting-business-transactions/117921](http://www.igi-global.com/chapter/using-business-value-models-to-elicit-services-conducting-business-transactions/117921)

## Related Content

---

### A Service Bus Architecture for Application Integration in the Planning and Production Phases of a Product Lifecycle

Jorge Minguez, Stefan Silcher, Philipp Riffelmacher and Bernhard Mitschang (2013). *Mobile and Web Innovations in Systems and Service-Oriented Engineering* (pp. 176-191).

[www.irma-international.org/chapter/service-bus-architecture-application-integration/71997](http://www.irma-international.org/chapter/service-bus-architecture-application-integration/71997)

### Test-Case Mutation

Macario Polo and Mario Piattini (2007). *Verification, Validation and Testing in Software Engineering* (pp. 157-176).

[www.irma-international.org/chapter/test-case-mutation/30751](http://www.irma-international.org/chapter/test-case-mutation/30751)

### Validation and Verification of Software Systems Using Virtual Reality and Coloured Petri Nets

Hygo Oliveira de Almeida, Leandro Silva, Glauber Ferreira, Emerson Loureiro and Angelo Perkusich (2009). *Software Applications: Concepts, Methodologies, Tools, and Applications* (pp. 3361-3380).

[www.irma-international.org/chapter/validation-verification-software-systems-using/29566](http://www.irma-international.org/chapter/validation-verification-software-systems-using/29566)

### A WYSIWYG Approach to Support Layout Configuration in Model Evolution

Yu Sun, Jeff Gray, Philip Langer, Gerti Kappel, Manuel Wimmer and Jules White (2012). *Emerging Technologies for the Evolution and Maintenance of Software Models* (pp. 92-120).

[www.irma-international.org/chapter/wysiwyg-approach-support-layout-configuration/60718](http://www.irma-international.org/chapter/wysiwyg-approach-support-layout-configuration/60718)

### Prioritizing COVID-19 Vaccine Delivery for the Indian Population

Meet Singh, Subrata Modak and Dhrubasish Sarkar (2022). *International Journal of Software Innovation* (pp. 1-21).

[www.irma-international.org/article/prioritizing-covid-19-vaccine-delivery-for-the-indian-population/301228](http://www.irma-international.org/article/prioritizing-covid-19-vaccine-delivery-for-the-indian-population/301228)