Chapter V

Pragmatic-Driven Approach for Service-Oriented Analysis and Design

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Abstract

This chapter presents a pragmatic-driven approach for service-oriented information system analysis and design. Its uniqueness is in exploiting a design foundation for graphical description of the semantic and pragmatic aspects of business processes that is based on the service-oriented principles. Services are viewed as dynamic subsystems. Their outputs depend not only on inputs, but on a service state as well. Intentions of business process experts are represented in terms of a set of pragmatic dependencies, which are driving the overall system engineering process. It is demonstrated how pragmatic aspects are mapped to

conceptual representations, which define the semantics of business design. In contrast to the traditional system development methodologies, the main difference of the service-oriented approach is that it integrates the static and dynamic aspects into one type of diagram. Semantics of computation independent models are expressed by graphical specifications of interactions between service providers and service consumers. Semantic integrity control between static and dynamic dependencies of business processes is a one of the major benefits of service-oriented analysis and design process. It is driven by pragmatic descriptions, which are defined in terms of goals, problems and opportunities.

Introduction

Service-orientation is an approach of designing an integrated business process as a set of loosely coupled services. The concept of service-oriented architecture (SOA) can be used in different contexts such as products, technologies or design (Erl, 2005) style, methods and principles. In this chapter, we focus on SOA aspects that are related to system analysis and design style for engineering of enterprise and information system architectures that exploit service-oriented approach. The most fascinating idea about service concept is that it applies equally well to organizational as well as technical components, which can be viewed as service requestors and service providers. Despite of this fact, there is no complete agreement on the specific modeling principles of service architectures. Many approaches are focussing on design of services from software components by using object-oriented methods (Ambler, 2002), (Gustas & Jakobsson, 2004). Since the object-oriented models are based on computation dependent constructs, they increase complexity of a system specification. It results in difficulties for business process analysis experts to validate the design solutions and therefore, makes service architectures prone to inconsistencies, discontinuities and ambiguities.

Enterprise models (Gustas & Gustiene, 2004; Gustas, 2005) can be graphically defined by using a set of organizational and technical components, which are viewed as service requesters and service providers. Such components are represented by people, organizations, hardware or software. For instance, information systems could be viewed as a set of services that retrieve, store, remove and update information. If enterprise business processes are not aligned with IT services, then information systems do not always deliver what users really need. SOA starts from the premise