Chapter 16
A Procedure Model for a SOA–Based Integration of Enterprise Systems

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ABSTRACT

Enterprise systems are being transferred into a service-oriented architecture. In this article we present a procedure for the integration of enterprise systems. The procedure model starts with decomposition into Web services. This is followed by mapping redundant functions and assigning of the original source code to the Web services, which are orchestrated in the final step. Finally an example is given how to integrate an Enterprise Resource Planning System and an Enterprise Content Management System using the proposed procedure model.

INTRODUCTION

Enterprise resource planning systems (ERP systems) are enterprise information systems designed to support business processes. They partially or completely include functions such as order processing, purchasing, production scheduling, dispatching, financial accounting and controlling (Stahlknecht & Hasenkamp, 2002). ERP systems are the backbone of information management in many industrial and commercial enterprises and focus on the management of master and transaction data (Kalakota & Robinson, 2001). Besides ERP systems, enterprise content management systems (ECM systems) have also developed into companywide application systems over the last few years. ECM solutions focus on indexing all information within an enterprise (Müller, 2003). They cover the processes of enterprise-wide content collection, creation, editing, managing, dispensing and use, in order to improve enterprise and cooperation processes (Koop, Jäckel, & van

Offern, 2001; Kutsch, 2005). In order to manage information independently, ECM combines technologies such as document management, digital archiving, content management, workflow management and so forth. The use of ECM systems is constantly on the rise (Zöller, 2005). This leads to an increasing motivation for enterprises to integrate the ECM systems within the existing ERP systems, especially when considering growing international competition. The need for integration is also eminently based on economical aspects, such as the expense factor in system run time (Schönherr, 2005). For a cross-system improvement of business processes, enterprise systems have to be integrated.

RELATED WORK

Service Oriented Architecture as an Integration Approach

A number of integration approaches and concepts already exist. They can be differentiated by integration level (for example data, functions or process integration) and integration architecture (for example point-to-point, hub & spoke, SOA) (Schönherr, 2005). This article presents an approach to integrating enterprise systems by way of building up service-oriented architectures. This integration approach is of special interest and will be described in more detail.

The concept of service orientation is currently being intensively discussed. It can be differentiated from component orientation by its composition and index service (repository). Additionally, SOA is suitable for a process oriented, distributed integration (Schönherr, 2005). However, the addressed goals of component orientation and SOA are similar: different enterprise systems are connected through one interface, and a cross-system data transfer and the reusage of objects or components is enabled. Thereby a service represents

a well-defined function which is generated in reaction to an electronic request (Burbeck, 2000). The SOA approach offers a relatively easy way to connect, add and exchange single services, which highly simplifies the integration of similar systems (e.g., enterprise take-over). Moreover, SOA offers a high degree of interoperability and modularity (Behrmann & Benz, 2005), which increases the adaptability of enterprise systems (Gronau et al., 2006).

The SOA approach is based on the concept of service. The sender wants to use a service and in doing so the sender wants to achieve a specific result. Thereby the sender is not interested in how the request is processed or which further requests are necessary. This is the idea of SOA, where services are defined in a specific language and referenced in a service index. Service request and data exchange occur via use of predefined protocols (Dostal, Jeckle, Melzer, & Zengler, 2005; Küster, 2003).

This service orientation can be used on different levels of architecture. The grid architecture is a common example of infrastructure level (Bermann, Fox, & Hey, 2003; Bry, Nagel, & Schroeder, 2004). On the application level an implementation usually takes place in terms of Web services.

The use of Web services offers the possibility of reusing raw source code, which is merely transferred to another environment (Sneed, 2006). The benefit of this transfer is the re-usage of perfected (old) algorithms. The main disadvantage is the necessity of revising the raw source code in order to find possible dependencies (Sneed, 2006). This is also true for enterprise systems. It is not efficient to reuse the entire old system, but rather only significant parts of it. To accomplish this it is necessary to deconstruct the old enterprise system and to locate the source code parts which can effectively be reused. Our approach uses self-diagnosis for finding these source code locations. This analysis will be considered in the third integration step.

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