

Chapter 5.6

A SOA–Based Approach to Integrate Enterprise Systems

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ABSTRACT

This chapter presents a procedure for the integration of enterprise systems. Therefore enterprise systems are being transferred into a service oriented architecture. 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 with an Enterprise Content Management System using the proposed procedure model.

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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 (Monk et. al., 2005). ERP systems are the backbone of information management in many industrial and commercial enterprises and focus on the management of master and transaction data (Sumner 2005). 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 (Rockley, 2003). They cover the processes of enterprise-wide content collection, creation, editing, managing, dispensing and use, in order to improve enterprise and cooperation processes (CMSWatch, 2009). In order to manage information independently, ECM combines technologies such as document management, digital archiving, content management, workflow management, etc. The use of ECM systems is constantly on the rise (Lämmer et. al 2008). 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 (Aier & Schönherr, 2006). 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) (Aier & Schönherr, 2006). This paper 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 (Aier & Schönherr, 2006). 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 re-usage 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, which increases the adaptability of enterprise systems (Andresen et. al., 2008), (Lämmer et.al. 2008).

The SOA approach is based on the concept of service. The sender wants to use a service and in doing so he 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 pre-defined protocols (Erl, 2008), (Papazoglou, 2007).

This service orientation can be used on different levels of architecture. The grid architecture is a common example of infrastructure level (Bermann et. al., 2003), (Bry et. al., 2004). On the application level an implementation usually takes place in terms of web services.

The use of web services offers the possibility of re-using raw source code, which is merely transferred to another environment (Sneed, 2000). 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, 2000). This is also true for enterprise systems. It isn't efficient to re-use 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 re-used. Our approach uses self-diagnosis for finding these source code

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