# Chapter XXIII
# From ERP to Enterprise Service-Oriented Architecture

**Valentin Nicolescu**
*Technische Universität München, Germany*

**Holger Wittges**
*Technische Universität München, Germany*

**Helmut Krcmar**
*Technische Universität München, Germany*

## ABSTRACT

*This chapter provides an overview of past and present development in technical platforms of ERP systems and its use in enterprises. Taking into consideration the two layers of application and technology, we present the classical scenario of an ERP system as a monolithic application block. As the demands of modern enterprise software cannot be met by this concept, the shift to a more flexible architecture like the service-oriented architecture (SOA) is the current status quo of modern companies. Keeping in mind the administrative complexity of such structures, we will discuss the new idea of business Webs. The purpose of our chapter is, on the one hand, to show the historical development of ERP system landscapes and, on the other hand, to show the comparison of the presented concepts with respect to application and technology view.*

## INTRODUCTION

With the emergence of the SOA concept, the classical architecture of ERP system has started to change and is in a constant flux towards new structures. We want to show these changes, starting with the architecture of ERP systems and describing the different parts of this concept. To exemplify it, we will present the most important aspects of concrete implementations of these

principles. As one of the most important ERP systems, we will focus on the structure of the SAP ERP system and will describe the changes of this platform.

Our analysis will comprise of an application-centered and a technical view, considering changes in business paradigms and new technologies that enabled new kinds of business and process management. Starting at classical ERP systems and their implementation in SAP R/3, we will move on to the current concept of SOA and Enterprise SOA. This goes along with a change in technical architectures as well. The SAP NetWeaver platform will be presented as an example of complete Enterprise SOA platforms. Its most important functions will be pointed out and utilizing this example, components that are necessary to realize Enterprise SOA are identified. The light in which SAP NetWeaver is seen has changed in the last years as not the technical components are in the spotlight anymore but the applications that are made possible by such a platform. Finally, we will show the future concept of business webs which will base on Enterprise SOA and conclude our chapter with an outlook to the further development in this area of topic. The structure of our chapter is illustrated in Figure 1.

## CLASSICAL ERP SYSTEMS

Classical ERP system can be described as commercial software products that are adaptable to company-specific demands. Their typical functional modules include: purchasing, manufacturing, sales, finances, human resources, service and in general reporting. Classical ERP systems focus on data integration and also support process integration within one company.

The technical basis of an ERP system today is usually a Client/Server architecture, where often more than one application server is connected to the central database server. The user of a classical ERP system most time works with basic business transactions like “create order”, “update customer contact data”, “print invoice”, “execute report xy” etc. Changes within such a system due to business transactions are usually propagated in “business” realtime meaning a few seconds or minutes.

The following figure from Davenport visualizes the architecture of a classical ERP system. In addition to the facts mentioned before, there is usually a wide range of reporting functionality for management and stakeholders, based on the central ERP data.

There are a lot of advantages that unfold with the use of ERP Systems (Vogel and Kimbell 2005; N.N. 2007) In the following a few of them are spotlighted:

*Figure 1. Structure of this chapter*