Chapter IX

Enterprise Resource Planning for Intelligent Enterprises

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ABSTRACT

This chapter describes enterprise resource planning (ERP) systems as a fundamental tool in the intelligent enterprise and therefore, constitutes an important element for knowledge management. The definition of these systems, their main characteristics and the historical evolution are presented. The ERP market and market trends are described, with special emphasis on the usage of the Internet as a key technological tool for the intelligent enterprise. Finally, the advantages and disadvantages of ERP systems are discussed as well as major problems encountered during their implementation.

INTRODUCTION

This chapter describes enterprise resource planning (ERP) systems as a fundamental tool in the intelligent enterprise. Using the intelligent enterprise communication infrastructure and databases, ERP systems are expected to provide the information required both to decision makers within the enterprise as well as to the collaborators in

the supply chain. Furthermore, because these systems contain the organizational structure of the enterprise, they act as a repository of corporate knowledge and therefore, constitute an important element for knowledge management.

The objective of this chapter is to provide a comprehensive vision of the main issues regarding ERP systems within the context of intelligent enterprise. All fundamental aspects of ERP systems are covered from both a technological and business perspective. Special attention is given to issues related to the trends and tendencies in ERP systems and their integration with other tools and technologies for the intelligent enterprise.

ENTERPRISE RESOURCE PLANNING SYSTEMS

Definition of ERP System

Enterprise resource planning systems are packaged software to support corporate functions such as finance, human resources, material management, or sales and distribution (Slater, 1998). Most ERP packages also provide multiple language and currency capabilities, allowing operations in different countries to become more integrated.

Main Characteristics of an ERP System

Despite the differences existing among ERP products, most enterprise resource planning systems share a number of common characteristics, both from a technological as well as a business perspective.

From a technological perspective, the characteristics include:

- **Client/server, open systems architecture.** Nearly all ERP systems employ client/server technology, separating the core processing and data management—which are carried out by the server(s)—from the user interface—done by the clients. Connection between servers and clients is usually provided through a local/wide area network. Consequently, most ERP packages follow an open systems architecture that separates data, application, and presentation (user interface) layers, guaranteeing cross-platform availability and systems integration. As a consequence, the data management system of an enterprise resource planning system is not addressed by the ERP package itself but relies on third-party database software. Finally, a separated presentation layer provides a common user interface across different technological platforms. Figure 1 depicts the Client/Server architecture of an ERP system and the separation into layers. Finally, in order to interoperate with existing business applications or information systems, most of the ERP systems in the market adhere to most of the common standards for data exchange or distributing processing, such as XML, DCOM, OLE, etc.

- **Enterprise-wide database.** One of the most distinguishable characteristics of ERP as compared with traditional information systems is the strong centralization of all relevant data for the company. Usually, centralization not only means logically centralizing but also physical centralization as well. When the physical centralization is not possible, synchronization mechanisms among the different databases should be implemented in order to ensure data consistency throughout the entire enterprise.

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