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Knowledge management across the enterprise resource planning systems life cycle

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Abstract

This paper investigates the use of knowledge management to support enterprise resource planning (ERP) systems across their entire life cycle. Knowledge management can be used to support ERP system in their choice, implementation and use, both inputs and outputs. This paper summarizes a number of actual examples and discusses some emerging efforts, focusing on knowledge management, with particular interest in case-based knowledge management. A prototype system designed to support the use of an ERP system is presented.

Keywords: Enterprise resource planning systems; Knowledge management

1. Introduction

One of the largest areas of software implementation is what is referred to as enterprise resource planning (ERP) systems. Perhaps the best known of the ERP systems include those known as the ERP "big four": SAP, PeopleSoft, Oracle Applications, and J.D. Edwards. Other well-known systems include Lawson, Great Plains, and Platinum.

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ERP systems are software that can integrate across multiple functional areas by focusing on processes, rather than the individual functions. At one level, ERP systems provide transaction processing capabilities that help to integrate all of a firm's transaction processing. At another level, using that transaction processing information, the firm can plan their activities, such as production. This suggests that knowledge management can be used for a range of activities, e.g., transaction processing support.

Architecturally, ERP systems generally are based on a relational database system, such as Oracle. Using a relational database and appropriate process redesign allows the firm to capture data once they are generated. Then, reports can be generated so that all users have access to the same information. This allows for "information congruence," e.g., so that each functional area makes use of the same sales forecast, resulting in fit between key areas of the firm, such as marketing and production. As a result, some knowledge management may be able to exploit the underlying information and database structure, as is seen in the prototype system developed below.

Both large and small firms have adopted ERP systems. It has been estimated that virtually all of the Fortune 500 firms have either implemented an ERP system or are implementing an ERP system. In addition, small- to medium-sized enterprises also have adopted ERP systems. For example, in 1997, roughly 35% of SAP's customers had revenues under US$200. As a result, the knowledge management needs can vary substantially across different clients.

Implementation of ERP systems has grown to be an important consulting business. During the late 1990s, it was estimated that roughly one-third to one-half of the consulting done by the major consulting firms has to do with choosing, implementing, or using ERP systems (Public Accounting Report, 1998). Further, additional consulting often is done after the ERP system has been installed, e.g., improving configuration and security. As a result, there is a large potential for knowledge management through the life cycle, both for consultants and the companies implementing the software.

ERP systems are large. As one measure of their size, Quantum's implementation of Oracle's ERP application reportedly has over 40,000 tables (e.g., O'Leary, 2000). In addition, increasingly, ERP implementations are accompanied by large data warehouses, and designed to facilitate data access and improve the reporting capabilities. Because of their size and cost, companies can benefit from substantial knowledge management efforts.

As a result of all of these developments, knowledge management systems are emerging as important tools to support ERP systems. Accordingly, the purpose of this paper is to discuss some of these knowledge management system developments across the entire ERP life cycle of choosing, implementing, and using ERP systems.

Section 1 provides the motivation for knowledge management in ERP systems and the background. Section 2 provides a brief background in knowledge management and case-based reasoning. Section 3 describes the use of knowledge management for choosing an ERP system. Section 4 investigates the use of case-based reasoning for supporting implementation of an ERP system. Sections 5 and 6 analyze the use of knowledge management for supporting the use of an ERP system, both for input and output of data. Section 7 briefly reviews the use of knowledge management by ERP vendors. Section 8