Chapter 71

Assessing Workflow Ability of ERP and WfM Systems for Implementing Business Processes

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ABSTRACT

Automation of a business process can be obtained by using a workflow management system or ERP system embedding workflow functionalities. The wider diffusion of ERP systems tends to favor the latter solution. There are several practical limitations of most ERP systems when automating business processes. To date, there is a lack of empirical studies aiming at achieving an evidence of these limitations. This chapter reports a study assessing the "workflow ability" of ERP systems and comparing this with that of Workflow Management Systems. Then, an empirical study was conducted regarding two different case studies. The correctness and completeness of the process models implemented using ERP and WfM systems were evaluated and analyzed.

INTRODUCTION

Fast changing business requirements forces enterprises to support their business processes with appropriate software applications in order to effectively execute the related business activities. The software systems mainly considered from enterprises with this purpose belong to the following two categories: Enterprise Resource Planning (ERP) systems and Workflow Management (WfM) systems.

ERP systems essentially represent multi-module applications integrating activities across functional departments, from product planning, purchasing, inventory control, product distribution, to order tracking (Kumar & Van Hillsgensberg, 2000; O'Leary, 2000). ERP systems are

designed around the idea of applications that need to be configured to the enterprise requirements. The higher the possibility for configuration is, more flexible the support for the business process may be. WfMSs are a new kind of information technology designed for automating business processes by coordinating and controlling the flow of work and information between participants. When a WfMS is used, a workflow model is first defined for the specific requirements of the enterprise and, then, workflow instances are created to perform the activities described in the workflow model.

ERP and WfM systems manage the processes via various different approaches. This chapter assesses the "workflow ability" of ERP systems, comparing it with that of Workflow Management Systems. The aim of this assessment is not to compare WfM and ERP systems, whose aim and support level are completely different and, then, not comparable. The chapter focuses on the analysis of the service offered by ERP systems regarding the management of the business process and compare it with the main functionality offered by WfMSs. In particular, the chapter analyses the workflow ability of ERP and WfM systems. The expression "workflow ability" is used for indicating the capability of a software system of effectively and efficiently supporting the modeling, execution and monitoring of a business process. With this in mind, two analyses were performed. The first analysis concerns the assessment of a set of ERP and WfM systems for comparing the availability and usability of a set of functionalities regarding the workflow ability and needed for the automatic business process management. Then, considering the limitations observed in several functionalities of most ERP systems with reference to the automation and management of business processes, a second analysis was performed. It regarded an empirical study aiming at observing the way both ERP and WfM systems manage business processes and at understanding which class of systems offers a more efficient and effective support to the management of business processes.

THEORETICAL BACKGROUND AND RELATED WORK

Workflow Management System is a technology mainly focused on the automation of business processes. It is widely adopted for supporting production activities of people in enterprises (Hollingsworth, 1995; Fischer, 2002). By contrast, ERP systems mainly address the need of having an integrated database that serves different functional modules supporting specific tasks of the enterprises. In the literature, there are several definitions of ERP systems (Sarmand, Marinos, & Rashid, 2004; Hossain, Patrick, & Rashid, 2002; Davenport, 1998).

ERP systems overcome the data separation of multiple functional applications by allowing individual modules to share the same data. Moreover, most of them contain functionality for modeling, deploying and managing workflows. The ERP "embedded" Workflow System is a module which is a part of the core ERP architecture.

Works related to the study presented in this chapter mainly focus on the differences existing between ERP systems and WfMSs and/or definition of frameworks and approaches for facilitating their integration. A strategy proposed for their integration consists of using of a WfMS as a mean for implementing a workflow controlling the ERP functionalities (Cardoso, Bostrom, & Sheth, 2004). The problem of this approach was highlighted in (Hossain, Patrick, & Rashid, 2004) and mainly deals with the difficulties of managing inconsistencies between the two systems.

Several other strategies address the integration problem by considering the WfMS as a "middleware" orchestrating legacy applications and ERP systems. Newmann and Hansmann (Neumann & Hansmann, 2002) developed an architecture for the integration of a WfMS and planning functionality for the production and control embedded in ERP systems (Neumann & Hansmann, 2002). Brehm and Gomez proposed an approach for federating ERP by systems exploiting an architecture based

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