Enterprise Applications for Supply Chain Management

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ABSTRACT

Although many companies have implemented ERP systems to track and share information among cross functional business processes, they often supplement these with legacy, custom, or best of breed applications to support supply chain execution and management. This article offers a framework for understanding all types of enterprise applications that support the supply chain. In this study, the author organizes these applications, define acronyms, and describe the various types of systems that make up an information infrastructure for supply chain management.

Keywords: B2B Markets, Customer Relationship Management, E-Procurement, Enterprise Content Management, Supply Chain Management, Vendor Managed Inventory, Warehouse Management Systems

INTRODUCTION

Coordination of information to effectively operate and manage a supply chain can be a source of competitive advantage today; a supply chain is only as good as its weakest information link. Companies continue to invest in technology to gather and utilize information, acquiring and integrating various different types of enterprise applications. The foundation of most enterprise information infrastructures today is the enterprise resource planning system (ERP) which has greatly reduced the number of applications required to track and share information among cross functional business processes. Basic ERP vendors such as SAP and Oracle have greatly enhanced their offerings with modules that add on functionality for many supply chain processes. However, many companies supplement basic ERP systems with legacy, custom, and best of breed applications for supply chain execution and management.

Supply chain management information systems have been defined as "systems used to coordinate the movement of products and services from suppliers to customers" (Wang, Yan, Hollister, & Xing, 2009). Studies of supply chain management information systems primarily focus on logistics and production processes (Rutner, Gibson, & Gustin, 2001), or B2B integration (Chalasani & Sounderpandian, 2004; Dong, Xu, & Zhu, 2009), or a category of systems for sourcing called supplier relationship management systems (Choy, Lee, & Lo, 2004). Some studies focus on specific types of applications, e.g., green SCMS (Ko, Tseng, Yin, & Huang, 2008; Sahay & Ranjan, 2008) or supporting technologies such as RFID

(Ozelkan, 2008). No peer-reviewed studies have encompassed the range of functionality of even the most widely-used commercial SCM IS packages (McLaren & Vuong, 2008). And even the broader studies that focus on systems to support supply chain processes (Wang et al., 2009) do not consider all the various applications that need to integrate with these processes in order to create an overall enterprise infrastructure for supply chain management, including, for example, business intelligence for supply chain management (Sahay & Ranjan, 2008).

Our purpose is to bring together all the various applications that are required to build an enterprise information infrastructure for supply chain management. Our main objective is to organize, define acronyms, and describe all the different applications that make up an information infrastructure for supply chain management. Examples of the use of the different applications are provided. Our objective is to provide an overview of the different applications, rather than an in-depth analysis of each one, to assist in understanding the scope of applications related to development of a complete supply chain infrastructure. This article offers a framework for understanding all the various types of information systems that support the supply chain, not just those that support B2B integration or logistics or sourcing.

BUILDING AN ENTERPRISE INFORMATION INFRASTRUCTURE

Table 1 provides an overview of the various applications supporting supply chain management today. This table was developed after an extensive review of literature, both academic and practitioner, web sites of major vendors, and interviews. Interviews with both supply chain and IT infrastructure managers in several companies in different industries validated our classification of the three objectives of the existing applications: to run the business, manage the business, and support collaboration with business partners. Participants felt that this

framework was more compelling for organizing supply chain management applications than traditional classifications of information technologies by organizational structure, functional area, or support provided (Turban, McLean, & Wetherbe, 2001).

Our objective was to provide an overview of all possible types of applications that might be considered to support the supply chain. In addition to applications supporting the key SCOR processes, we therefore included supporting applications, such as communication and productivity tools and applications that support cross business processes, as well as SCM related processes. The integration of ALL these applications today can serve to enhance supply chain management.

Fundamental to all information processing are communications and office productivity tools that enable access, sharing, and interpretation of enterprise information in a timely manner. Enterprise Content Management (ECM) systems capture, store, preserve, and deliver unstructured content, providing an integrated location for supply chain team members to find organizational resources and expertise, manage content and workflow, and collaborate.

ERP and BI (business intelligence) applications support cross functional transaction processing and management. Collaborative work spaces such as Microsoft's Sharepoint support portals, wikis, and workflow for collaboration within companies but also with business partners.

The strength of an ERP is its ability to track, record, and integrate information about all transactions and activities within a corporation. By adopting a single ERP, companies can adopt consistent work processes across all regions. This can bring significant improvement. For example, from 2004-2007 when Air Products and Chemicals, Inc., a $10 billion global supplier of chemicals and industrial gases, implemented SAP, they reduced SGA by 2.5% and inventory by 10%, with a 10% improvement in employee productivity and a 3% increase in return on capital (SAP, 2007). Similar success

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