Enhanced supply chain management for e-business transactions

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Abstract

This paper reports on the development of an open supply chain management system that is able to support the e-business activities of a contemporary enterprise. The system was first built to address the needs of a Greek textile industry and successfully integrated a workflow management module, a demand-side transactions module and a supply side transactions module with the company's legacy ERP system. The paper discusses technical issues concerning the development of the overall platform, which is able to efficiently support e-business transactions, independently of the underlying technology and communication protocols used from the related parties. Particular attention is paid to the presentation of the benefits arising from the improvement of supply chain management. The proposed approach aims at increasing the service level and establishing a cooperative environment among all parties involved, while reducing the transactions costs through the appropriate process automation and decreasing the company's inventory levels due to faster transactions.
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1. Introduction

Information and communication technologies certainly play a pervasive role in the supply chain of an enterprise, since all related activities create, use and share information. At the same time, the growing sophistication of these technologies is a powerful force in opening up possibilities for interrelationships. This has to be considered together with current market and business changes, which compel companies to establish fast, continuous and secure interactions with their

trading partners, being they customers or suppliers.

Efficient information integration plays a key role in supply chain management, while coordination of the supply demand relationship, by managing the flow of materials and products and the flow of information with flexible control and feedback mechanisms, is also an important issue (Thomas and Griffin, 1996; Albino et al., 2002; Claudio Garavelli, 2003). The establishment of an open supply chain management system creates opportunities for further improvements in the companies involved. Appropriate linkages may enable enterprises to fundamentally alter their supply chain relationships (Tang et al., 2001) and facilitate reduced inventory requirements. This is

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due to the improved information coordination capability of such an infrastructure. As comprehensively discussed in Lieb (2000), companies increase the trend toward outsourcing their inbound and outbound logistics. Thus, efficient exchange of logistics information between shippers, third party logistics providers and buyers is enhanced, leading to streamlined production planning systems and reduced inventory requirements. In addition, such an approach enables companies with new modes of supply chain information flows. As highlighted in Warkentin et al. (2000), such flows were traditionally linear, from one firm to its immediate suppliers or immediate distributors. In other words, information beyond one link in the chain was constrained by lack of formal relationships and did not convey efficiently due to a lack of data representation schemes.

Modern business models and practices require dynamic and easily accessed services (Timmers, 1998). The wide and rapid adoption of Internet is re-setting the rules of how people interact, buy, sell and exchange goods and services. Contemporary ways of trading, allowing interaction between groups that could not so far economically afford to trade with each other, have been introduced. Whereas previously commercial data interchange involved mainly the transmission of data fields from one computer to another, the new model for web-based business, introduced by the advent of the Internet, is typically dependent on human interaction for the transaction to take place. The new model is principally based on the use of interactive selection of a set of options, and on the completion of electronic forms, to specify user profiles, queries, requirements, etc. To be fully interactive, a company needs to be able to understand the business concepts represented in the interchanged data, and apply business-specific rules to trigger the appropriate actions.

Addressing the issues listed above, this paper reports on the development of an open supply chain management system that is able to support the e-business activities of a contemporary enterprise. The system automates efficiently intra-business, business-to-business and business-to-customer processes, while aiming at assisting all

parties involved (i.e., customers, suppliers and employees of the enterprise). Section 2 presents the basic components of the proposed system and their integration with a legacy *Enterprise Resource Planning* (ERP) system of the enterprise. Section 3 discusses various supply chain management issues paying particular attention to the presentation of the benefits arising from the adoption of the system. Finally, Section 4 concludes the paper.

2. The integrated platform

This section reports on the development of the proposed system for the needs of a medium-scale textile enterprise in Greece. Before heading to e-business, the company was running a customizable ERP system, namely the *Atlantis ERP* by *Unisoft S.A.* (for more, see http://www.altec.gr/gr/altec.asp?aid = 20), for about seven years. It should be noted here that this was not fully exploited, in that neither all of its features and abilities were activated nor all business parts were being monitored. Market and business changes, such as increasing competition and shortening of products life cycle, led the company to the decision that they need to heavily invest in contemporary information technologies to both keep its status and gain competitive advantages. It was clear that such technologies would efficiently aid them to communicate, collaborate, and conduct business activities such as marketing, billing, and continuous customer service. In addition, on their way to embark on e-business, the company needed to exchange data with their trading partners, who may be using different platforms and a variety of data formats. For that, it was necessary to leverage their IT investments and integrate legacy data, residing in the existing application.

2.1. Analysis and design issues

To make business transactions more efficient, two major issues had to be considered in detail: the technology that a system able to address the above changes should be based on, and the underlying business processes of the company (Froehlich et al., 1999). The system envisioned certainly had to fit