Chapter 3
Integrated Supply Chain Intelligence through Collaborative Planning, Analytics and Monitoring

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ABSTRACT

As supply chains are growing increasingly complex, from linear arrangements to interconnected, multi-echelon, collaborative networks of companies, there is much more information that needs to be stored and analyzed than there was just a few years ago. Today, there are variety of business initiatives and technologies such as joint planning and execution, business intelligence, performance management, data mining and alerting that can be used for more efficient supply chain management. However, organizations still lack methods, processes and tools to successfully design and implement these systems. In this chapter, the authors present the integrated supply chain intelligence (SCI) system that enables collaborative planning and decision making through web-based analytics and process monitoring. The system is process based and utilizes business intelligence and Internet technologies. Multi-layered and service-oriented architecture enables composition of the new breed of SCI applications. They describe main elements and capabilities of the system, its advantages over existing systems and also discuss future research trends and opportunities.

INTRODUCTION

Today's competitive, fast-moving business environment has irrevocably changed the supply chain and the management of its functions as we know it. The traditional chain of sourcing, production, and distribution processes linked in a linear and simple fashion is no longer a reality given the complicated and global rate at which business is now conducted.

Supply chains are rapidly evolving from linear arrangements to real-time, customer facing networks. Many industry pundits have even created new nomenclature: it is no longer a "supply chain" but rather a "supply network" (Ladd, 2004).

The new approach to supply chain management means that companies must find a way to improve communication and information flow, thereby converting the traditional supply chain into an adaptive and real-time supply network. The theory is that this will allow companies to realize the holy grail of the supply chain - a holistic, responsive and flexible management of a network of supply chain resources that improve production and increase profitability (SAP, 2007).

During the transition to adaptive networks, companies must map the three key process enablers – the management of visibility, velocity, and variability – to the three key information enablers – quality, timeliness, and depth of information (SAP, 2002).

This means that supply networks need to be not only cost-effective, but also to be (Lee, 2004):

- **Agile:** Respond quickly to disruptions and unexpected changes in business environment and within the supply network. They need to be able to alter processes on demand and meet short term necessities better than other networks.
- **Aligned:** Interest of all supply network partners need to be aligned with the global supply network strategy. Global approach and collaborative planning and decision making are the keys to successful coordination.
- **Adaptable:** Supply network need to evolve over time and to adapt processes to meet other partner, key customer, and changing market needs.

The current economic crisis stresses even more the importance of coordination and information transparency in the supply network. Maybe more than ever, companies need to closely collaborate in planning and decision making, and manage business processes better than other networks in order to preserve sustainable development. With analytics, companies that share information about their supply chain management (SCM) processes up and down this supply network will be able to capture more surplus than companies that do not share the information (Hughes, 2003).

Historically, businesses have been reluctant to share such information, even with their most trusted partners. However, there is a growing recognition that by sharing analysis of business process data across the supply chain, the overall profit will grow as partners become more responsive to the market. A number of companies in vertical industries are already collaborating online with initiatives such as vendor-managed inventory and collaborative planning, forecasting and replenishment (CPFR).

In practice, there has been wide adoption of supply chain management concepts for both for business planning and execution. Research analysts report that many companies implemented different SCM systems and spent substantial sums. The investments made by companies were very large, regularly larger than projected in the original plans. Consequently, questions about the return of investment (ROI) started to arise. Details about unsuccessful SCM projects are not broadly reported in the press, simply

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