

The Essential Supply Chain

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Executive Summary

Supply Chain Management has been a major contributor to the premise that Information Technology can produce a return-on-investment beyond productivity improvement. Through use of analytic techniques, Supply Chain Management has delivered significant cost reduction for manufacturers, distributors, retailers and other enterprises relying on movement of product as their source of revenue.

Inventory turn improvement, transportation and freight cost reductions, warehousing improvements and other physical distribution elements have generated marked savings for these companies. However, the really significant benefits have resulted from improved purchasing and increased product availability. The former reduces the Cost of Goods Sold (COGS) while the latter has the potential of increasing revenues through the reduction in "lost sales."

No longer a stand-alone solution, SCM has the ability to integrate with Enterprise Resource Planning (ERP) to improve the quality of the information and enhance the value of its decision-making capabilities. SCM is the "killer application" that can justify IT expenditure. The hardware that might otherwise be very difficult to manage in a cost-justification analysis, now is the vehicle to achieve performance improvements, cost-reductions and even increased revenues.

Supply Chain Management vs. Enterprise Resource Planning

Where SCM was once viewed as a way to obtain a competitive advantage, companies are now beginning to perceive it as a logical and necessary extension of ERP. It also represents the best method of entry into the realm of business-to-business collaboration, which is simply an extension of the supply chain to include upstream and downstream trading partners (i.e., suppliers and customers).

There are several reasons why ERP vendors have been augmenting their transaction processing systems with supply chain management applications. First, traditional ERP systems simply lack the advanced planning tools necessary for companies to respond to an increasingly competitive business environment. There are three fundamental limitations of ERP systems in this regard:

Execution Focus

ERP systems were developed primarily for transaction processing, data collection, and data reporting. Quite predictably, users who accessed the ERP databases hoping for the insight needed to make good decisions were overwhelmed by the sheer volume of content. The true benefit of large amounts of historical transaction data cannot be leveraged for business insight without sophisticated analysis tools and data reporting techniques required to make sense of the data. As a result, traditional solutions lacked the capability to support critical business decisions in real-time.

Certainly, ERP systems have advanced since their introduction in the early 1980s, however, most remain true to their original purpose and are not well suited to enable customers to make rapid, highly complex business decisions.

Poor Flexibility

Clients considering prospective IT or business process reengineering projects usually find themselves faced with a tradeoff between the way they want to conduct business and the method supported by the particular application. More a trap than a tradeoff, this situation can sometimes be avoided if business strategy is made the first area of reengineering. ERP solutions, in many cases, can compromise competitive advantages of organizations through its "lowest common denominator" approach to automating business process.

However, in cases where an implementation is already underway, project teams are often required to compromise on functionality in order to complete the project on time or within budget. This occurs because many systems do not offer the flexibility and functionality required to accurately model the desired business processes. Large ERP vendors historically are the biggest offenders in this regard. Though the mySAP.com initiative of SAP seeks to overcome this limitation, R/3 is a prime example. These systems often hard-code assumptions regarding operating constraints such as available manufacturing capacity and production lead times. Plans created under these assumptions can hardly be expected to produce optimal results for a given client's particular complexities.

One-Dimensional Planning

ERP systems normally employ some flavor of MRP (Material Requirements Planning) or MRP-II (Manufacturing Resources Planning) for internal supply chain planning. The problem with these traditional planning methodologies is their sequential nature, which makes them unable to consider multiple constraints simultaneously. For example, a plan that begins with a demand forecast can be used to generate product requirements for the manufacturing facilities, which can then be checked against available material and capacity. However, plans created by sequential techniques are rarely optimal on the first attempt. It becomes

necessary to refresh the system with updated constraint information and start the process anew. Because businesses change around the clock, sequential planning can never produce a truly optimal plan for a useful period of time.

Supply chain management addresses these limitations more effectively and at (usually) lower cost than ERP. Where ERP systems focused on transactions, SCM was geared towards analysis and planning. A planning tool, in its nature, is expected to be flexible. Also, because the SCM market is newer than ERP, smaller SCM vendors have had the benefit of hindsight and have targeted their applications at the gaps in ERP systems. In addition, the advanced techniques developed for supply chain applications allow consideration of simultaneous constraints that enables companies to have real-time visibility to their businesses.

Rise of Information Technology

The second reason why SCM is on the hearts, minds, and lips of corporate IT organizations has nothing to do with ERP, but relates to the phenomenal growth of information technology. As advances in computing power and data transmission continue, enterprises once thought to be too isolated or dissimilar are rapidly becoming tractable members of the supply chain community.

(The supply chain community encompasses the network of suppliers, manufacturers, distribution centers, and customers that share materials and information via technological means.) The Internet, Electronic Data Interchange (EDI) initiatives, and internetworking (LAN/WAN) technologies are just a few examples of technologies that are fulfilling the vision of SCM.

Market Consolidation

Finally, software vendors have observed the complementary nature of SCM and ERP and are consolidating their product suites. Perhaps more importantly, they have observed that prospective customers appreciate the ability to obtain applications offering full functional breadth from a single vendor.

Table 1 contains just a few of the major SCM-Enterprise Application vendor pairings that have occurred over the last few years. In addition to mergers, most ERP companies have entered into joint marketing arrangements with SCM vendors, embed their solutions, and/or provide standard interface certification programs. In like manner, SCM companies often partner with specialty supply chain execution software vendors in an effort to fill gaps within their functionality and industry verticals.

Table 1. Markets Converge: Some SCM pairings with other enterprise vendors

Enterprise Vendor	Type	SCM Vendor	Date	Acqu. Size or Percent Stake
Aspen Technology, Inc.	Acquisition	Chesapeake Decision Sciences	5/98	\$135 M
Baan Co. N.V.	Acquisition	Berclain Group CAPS Logistics	5/96 9/98	\$70 M \$68 M
J. D. Edwards & Co.	Acquisition	Numetrix	6/99	\$80 M
PeopleSoft, Inc.	Acquisition	Red Pepper Software Distinction Software	10/96 12/98	\$60 M \$10 M
SCT Corp.	Acquisition	Fygir Logistic Information Systems	9/98	\$35 M
JBA Holdings plc (GEAC)	Embedded License	Symix Systems	7/99	-
Mapics Solutions, Inc.	Embedded License	Symix Systems	7/98	-
Oracle Corporation	Embedded License	i2 Technologies	11/97	-
SAP AG	Investment	OKEF- techILOG Catalyst International	6/98 7/98 9/99	51% 5% 10%
Oracle Corporation	JMA	Industri-Matematik	1/97 (and "informal" earlier)	-
i2 Technologies	Interface	EXE Technologies	4/99	-
Great Plains Software	Embedded License	Logility	7/00	-

Key:

Acquisition: One company taking over controlling interest in another company
Investment: Equity investment by one partner in another in exchange for product technology

Embedded License: Code or Application-level integration of product in exchange for license fee, includes OEM agreements

JMA: Joint marketing agreement

Interface: Standard interface development through shared technology

Summary

Fundamental shortcomings of ERP revealed by the advance of technology and increasing customer demands are addressed neatly by supply chain management techniques. ERP vendors in pursuit of complete solutions will continue to seek a variety of relationships with providers of advanced planning and scheduling, logistics, forecasting, and other decision support technology. Supply chain management solutions have arrived as essential components for companies seeking to establish and maintain a successful business.