12-31-1999

Supply Chain Management (SCM) and Organizational Key Factors for Successful Implementation of Enterprise Resource Planning (ERP) Systems

Constantinos Stefanou
Technological Educational Institution of Thessaloniki

Supply Chain Management (SCM) and Organizational Key Factors for Successful Implementation of Enterprise Resource Planning (ERP) Systems

Constantinos J.Stefanou, Technological Educational Institution of Thessaloniki, kstef@it.teithe.gr

Abstract

This paper reports some findings of an on-going research into ERP implementation issues. A part of the research, which this paper reports, consists of reviewing several cases of successful implementations of ERP systems. The analysis of all these cases revealed that the critical factors for successful implementation of ERP systems fall into two main categories: technological and organizational factors. However, the organizational factors seem to be more important than the technological ones as far as the successful implementation of ERP systems under SCM is concerned.

Introduction

In the highly competitive global arena for attracting the customers' attention, organizations responded to ongoing changes by transforming dramatically the production process. Business process re-engineering (BPR) and more recently SCM practices have shifted the focus from functional to cross-functional and inter-organizational operations. Global-wide phenomena such as outsourcing, joint ventures and alliances, and partnerships across the value chain, have formulated a new form of organization described as "virtual enterprise". The emergence of "virtual enterprise" questions the nature itself of the traditional business information systems. Monolithic and stand alone business information systems are giving way to more flexible, integrated and modular systems that support business operations across the value-chain from the supplier to the customer.

SCM and the emergence of the ERP systems

SCM requires the management of materials and *information* flow in the whole chain, from suppliers through to customers. It has been argued that if business success is to be achieved, optimization of business processes across the value-added chain must be accompanied by modern processing technology for optimization of enterprise-wide information management. (Buck-Emden and Galimow, 1996). During the last decade, innovative business software companies, like the well known SAP, BAAN, Oracle, and PeopleSoft, utilizing modern technology, have moved into the direction of wide or cross-enterprise integration and developed flexible and multi-functional modular packages offering an overall view of the business and multi-dimensional information. Initially, ERP packages focused on optimizing internal business processes. Currently, ERP vendors are also offering data warehouse and SCM software. Demand forecasting and supply chain optimizing applications can be integrated into the standard ERP modules of Finance, Sales and Distribution, Human Resources and Manufacturing. In addition, the open architecture of ERP systems and the growing availability of component software and integration tools allows third party supply chain applications to be linked to ERP packages as well as to legacy mainframe systems.

In search of the competitive advantage: SCM and ERP systems

The decision of implementing an integrated all-in-one ERP package or best-of-breed systems is not always an easy one. Some companies have decided to invest in an all-in-one ERP package, as Colgate-Palmolive did with SAP R/3. (Marion, www.datamation.com). For some other organizations committed to SCM, an ERP integrated package may not provide the best solution for a function of their business they believe is crucial. In search of the competitive advantage, their CIO's search for the best-of-breed SCM or demand-forecasting software. Although high degree of applications and business integration is clearly an advantage of using an all-in-one ERP package, some companies cannot sacrifice the greater functionality they perceive third-party solutions offer. For example, BOEING, uses demand-forecasting software by i2 Technologies, ERP by Baan and product data management by Structural Dynamics Research while developing EDI links and Internet applications to be used by its suppliers and customers (Stein and Sweat, 1998). The US lubricants division of Mobil Oil, in order to control inventory flow among six different production sites, uses Manugistics' SCM and planning software. The system is currently connected to the corporation's legacy mainframe system but it will eventually be connected to Mobil Oil's SAP R/3 package. (Weston, 1998). In case of SCM applications, it has been reported that industry watchers agree that about 80% of companies will be satisfied with what an ERP vendor such as SAP offers, but the remaining 20% will go for best-of-breed applications from other software vendors (Stein, 1999).

Changing competitive conditions, new partnerships and expanding markets may demand new applications to

be developed. The open environment of ERP systems allows external workflow management systems to be incorporated into the core package through a suitable API (Application Programming Interface). For example, SAP's Business Application Programming Interfaces (BAPI) allows customers to use third party or internal developers' software solutions. Therefore, system flexibility, functionality and adaptability to changing conditions is greatly improved, through the development of new components which can be reused across different platforms, networks and multiple enterprise systems. This emerging Enterprise Application Integration (AEI) market is a fast-growing market, which will reach $1billion by the year 2000 (Aberdeen Group, 1998). Interchange of data and customer services can be further improved by the integration of material requirements planning (MRP) and EDI or Internet technologies. It should be noted that the optimization of business processes in order to increase customer satisfaction is not a static activity. The implementation of an ERP system is a continuous effort, requiring strong management support and vision. The development of applications can be done internally by trained developers or by employing external consultants. For most companies, as for Reebok for example, a mixture of few external consultants and 30-plus trained internal developers seem to be the winning strategy for successful ERP system implementation (Stedman, 1999).

ERP Organizational Implementation Issues

The implementation of ERP systems across the supply chain is a complex process. Various technological and organizational issues must be managed carefully if costly implementation failure is to be avoided. Moreover, for the successful implementation of ERP packages under SCM practices, the required organizational change, through corporate cultural transformation, is crucial. The following key factors for successful ERP system implementation were identified by analyzing a large number of cases that were published during the last few years in respected periodicals or reported by leading IT and management consulting firms.

Trust between partners - Willingness for information sharing

It has been pointed out, that for any form of business structure that is built on partnership, the application of economic chain costing, and therefore business optimization, requires information sharing not only inside a company but between the companies that formulate the partnership. (Drucker, 1995).

This is an important factor with two main aspects: a technological and a corporate culture aspect. First, as far as the technological aspect is concerned, until recently, cross-enterprise or even wide-enterprise operations were not easily accommodated within the traditional business IS framework. The business systems developed during 1960-1990 are mainly stand-alone, function-specific and task-specific systems, vastly different from the kind of information systems required today to support organizational needs, as Rockart and Hoffman (1992) point out. For example, a traditional MRP system cannot simply be useful for a multi-site production process aimed at satisfying multi-customer preferences. A different approach is also required for the satisfaction of increasing financial information needs, due to market globalization, the diversity of business activities, and the intensity of market competition. However, the second aspect, corporate culture, seems to be the crucial one: Even if wide or cross-enterprise operations are technically fully supported, information sharing is largely a cultural and not a technological issue. The *willingness* to share information inside a company and between different companies requires *trust* between the partners (employees, managers and corporations) and is a key factor in implementing ERP systems successfully across the supply chain. Prestige, job security and control feelings, as well as departmental politics are also involved. For example, in Battco, the battery division of a manufacturing company, during the implementation process of SAP R/3, they realized that the sales people were gaining prestige by being the sole source of information regarding customers changing requirements. These people were reluctant in sharing this kind of information with others (Bancroft et al, 1998). In the same company, the finance manager was also reluctant to share information with people who felt that they could not understand it and she was also concerned that she could loose some control over her job.

Team-work – Communication skills

Team-work is an important implementation issue of ERP systems. The following example shows that a technical issue at first sight can sometimes only be resolved through team-work and sincere work relationships. It has been recently reported that when Cable Systems International were to implement SAP's R/3 integrated ERP system, they performed a test on how information flowed from one module to another. The result was that data did not cross-check, and therefore, as the vice president of operations pointed out, the company created cross-lateral teams involving employees from financial, IT, customer service and production-control functions who shared information in order to harmonize the data. The result of this team-work had also an extra benefit as now *"employees know more about the whole enterprise vs. being a part of a niche*". (Appleton, www.datamation.com).

Transformational leadership

There is little doubt that communication skills and clearly defined goals are of paramount importance for the

successful completion of such projects as the one described in the previous paragraph. However, sharing of common goals and adoption of new work relationships can sometimes be a major issue of organizational change. A transformational leadership, committed to *continuous* effort needed for the successful implementation of ERP systems, must resolve conflicts and properly manage resistance not only to new technology but also to new work relationships. Coordination of individual needs and goals must be planned carefully first, then it is easier to coordinate individual technical skills required for successful ERP implementation.

Conclusion

The decade of 1990 can be described as a period of transition from rigid and stand-alone business information systems to flexible and integrated enterprise wide information systems. ERP systems provide a robust and modular framework of business applications, the fundamental purpose of which is integrating business and supporting managerial decision-making. There is a growing popularity of ERP systems among firms pursuing SCM. Companies searching for even a small competitive advantage and increased functionality have the possibility of implementing best-of-breed applications. But this must be done without sacrificing application integration, that is, the core of their system must remain their ERP suite. Companies operating in highly competitive and rapidly changing environments should rely on trained internal developers but also employ external consultants for rapid development and implementation of much needed applications, through interfaces offered by ERP packages, such as SAP's BAPI. The implementation of ERP packages is not straightforward. Companies pursuing SCM need first re-organize their human resources and transform their company culture and then think about the technical aspects of the implementation process. Commitment to team-work, advanced communication skills, internal developers' training, transformational leadership and organizational *"openness"* reflected in the willingness for information sharing, seem to be the key factors for successful implementation of ERP systems under SCM strategies. This of course requires a corporate culture that emphasizes the value of sharing common goals over individual pursuits and the value of trust between partners, employees, managers and corporations. Having trained employees in ERP system's philosophy across the organization is also a must for any successful ERP implementation.

Of course, many organizational implementation issues have yet to be resolved. Future research should focus on how firms pursuing SCM should change personnel's attitudes and behavior and manage the organizational change required for successful ERP implementation. Finding suitable methods for measuring the performance of both the companies participating in the supply chain and the ERP systems is also a major concern among IT and supply chain managers. Finally, a growing number of firms are competing globally and an understanding of the various international business practices and ethnic cultural elements is essential for successful ERP implementation.

References

Aberdeen Group: *Enterprise Application Integration: Advanced Technologies and a Sense of Process*, Boston, Dec.1998.

Appleton E.L. "How to survive ERP", *Datamation*, http://www.datamation.com/

Bancroft N.H, Seip H. and Sprengel A. *Implementing SAP R/3*, Manning Publications Co,1998

Buck-Emden, R. and Gamilow, J. *SAP R/3 System:A Client/Server Technology*, Addison-Wesley Longman, UK,1996

Drucker, P. "The Information Executives Truly Need", *Harvard Business Review*, Jan-Feb.1995, pp.54-62

Marion, L. "Best of Breed Reborn", *Datamation*, http://www.datamation.com/

Rockart, J.F. and Hofman J.D. "Systems Delivery: Evolving New Strategies", *Sloan Management Review*, Summer 1992, Vol.33,N.4, pp.21-31

Stedman, C: "ERP With Fewer Consultants", *Computerworld*, Jan.2,1999

Stein, T. and Sweat, J.: "Killer Supply Chains-Six Companies are Using Supply Chains to Transform the Way They do Business", *Information Week*, Nov.9, 1998, Issue: 708

Stein, T: "The Great ERP Debate-Whether All-in-One or Best-of-Breed Systems Are Best Depends on your Company's Needs", *Information Week*, Feb.8, 1999, Issue: 720

Weston, R. "Software Rattles the Supply Chain", *Computerworld*, Feb.16, 1998