Chapter 3.2
Technological Challenges in E-Collaboration and E-Business

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INTRODUCTION

E-collaboration takes advantage of the current Internet-driven business environment, which integrates the most advanced electronic technologies and the knowledge-based economy. Companies engaging in e-collaboration must participate in external business relationships by using computer interactions (Damanpour, 2001). Implementing e-collaboration strategy can require many sophisticated technologies and systems such as EDI, XML, eCRM. E-collaboration is thus confronted with the great challenge of re-engineering IT strategies and resources. "Nearly 80% of organizations that have rushed to establish Web sites for online retailing have failed to invest in the purchasing and distribution systems that make delivery of their products possible" (Neef, 2001, p.3). System failure has a profound effect on e-collaboration and e-business, both in the short and long-term. The tremendous complexity of information technologies has become a huge hurdle to companies embracing them, affecting their entire management strategy, process,

structure, and most importantly, business bottom line results. The main technological issues to be considered are associated with IT infrastructure, and managers' and operatives' knowledge and skills in e-collaboration and e-partnership. The following constitutes some of the key technological issues facing e-collaboration.

- Process and system alignment and integration
- Interoperability of systems
- Accessibility, security and compatibility of interorganizational information systems
- Traffic in collaborative e-commerce activities
- Sustained IT support and resources
- Transferring and sharing information and data
- Building and sustaining an effective virtual network structure amongst e-partners
- Quality and effectiveness of networking and communications (Zhao, 2004)

This article focuses on the most important technological challenges and issues facing e-collaboration and e-business in the areas of information flow, procurement, logistics, engineering and manufacturing, marketing, customer services, and human resources. It deals specifically with the process and system alignment and integration as well as the issues of interoperability which have become of primary concerns in the practices of e-collaboration

BACKGROUND

Generally speaking, e-collaboration refers to the use of the Internet and/or Internet-based tools among business partners beyond market transactions. The term is often used in the context of supply chain, in particular, in supplier-buyer relationships. E-collaboration is identified as one of the new areas of optimizing the relationship between supplier and OEM via the Internet. It is an Internet-supported, enterprise-spanning cooperation which is viewed as crucial during the development and construction process (the so called e-engineering process) (Kersten, Schroeder, & Schulte-Bisping, 2004). E-collaboration aims to facilitate coordination of various supply chain activities and decision-making processes. It often involves sharing of information and knowledge on which joint supply chain decisions can be made. Information that needs to be shared amongst supply chain partners often include sales data, inventory status, production schedule, promotion plans, demand forecasts, shipment schedule, and new product introduction plans. In addition to information sharing, e-collaboration provides opportunities for collaborative planning and new product development. By resorting to e-collaboration and Web technologies, supply chain partners can exchange product forecasts and replenishment plans and then develop new plans that meet market demand in a timely and effective way. Studies show that this kind of e-

collaboration enables the reduction of inventory costs and enhancement of customer service level across the supply chain (Lee & Whang, 2002). New product development is also facilitated by e-collaboration between business partners in which collaborative product development such as product rollover (the transition from one version of a product to its successor) is completed with efficiency and speed powered by Web technologies. Some of the popular e-collaboration methods include virtual workrooms, online visualization of demand forecast, online monitoring of capacity utilization, virtual development platforms and online visualization of business processes (Kersten et al., 2004).

In terms of the e-supply chain collaboration, simplified and standardized solutions based on common technology architecture must be instigated, which may include trading partner processes, multiple levels of connectivity amongst trading partners, internal infrastructure, and system reengineering to ensure e-supply chain interoperability (that is, the ability to be fully compatible and capable of being integrated with each other in e-business), and e-application architecture (Ross, 2003). Given the fact that many companies now operate in more than one electronic supply chain, multiple IT integration becomes paramount to their business operations. Interoperability can be achieved through process standardization and information standards (e.g., EDI and RosettaNet Standards). Studies show that the achievement of multiple IT integration brings significant benefits to the companies that implement it (Davis & Spekman, 2004). A study of implementation of e-SCM solutions shows that often the implementation is "fraught with difficulties, potentially enormous expenses, and significant trauma to even the best of organizations" (Ross, 2003, p.325). There are also issues relating to levels of implementation. As companies vary considerably in terms of the nature of their business, capacities, resources, size, developmental stage, culture, competency of leadership, and so forth, the strategy for e-col-

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