Collaborative Commerce

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INTRODUCTION

In the past few years, collaborative commerce (c-commerce) has been widely touted by practitioners and has caught researchers' attention. The business press constantly reported successful stories of c-commerce in which companies in various industries employed collaborative technologies to reap potential benefits. A recent report on the software market for c-commerce indicated that software for creating c-commerce would be the next stage of growth in the enterprise application business (Bellini, Gravitt, & Diana, 2001). The report estimated that the size of the c-commerce market would grow from $5.8 billion in 1999 to $36.5 billion in 2004 (estimated by AMR and IDC). Another report (Ferreira, Schlumpf, & Prokopets, 2001) showed that about 60% of 356 survey respondents considered c-commerce as critically important to their businesses in the year of 2001-2002 and 78% of the companies planned to implement c-commerce to improve supplier and customer interaction. Meanwhile, findings of academic research on issues surrounding c-commerce have been sporadically reported. Welty and Becerra-Fernandez (2001) investigated the issue of managing trust and commitment in collaborative relationships. Kumar (2001) delineated the features of information and communication technologies for supporting c-commerce. Chuang and Nakatani (2004) identified different types of c-commerce and the driver for each type of c-commerce.

Extending the concept of inter-organizational collaboration (Himmelman, 1996), Chuang and Nakatani (2004) defined c-commerce as an IT-enabled process in which organizations share information and resources, adjust their activities and augment each other's capabilities in order to reap mutual benefits while assuming common responsibilities, risks, and rewards. Johnson and Whang (2002) used the term "e-collaboration" to refer to the collaborative activities between businesses; however, Johnson and Whang placed emphasis on the role of the Internet and the concept of sharing. It is worth noting that while there are overlappings between the boundaries of collaborative commerce and electronic commerce, the difference between both lies in the fact that c-commerce is focused on joint intellectual effort, but e-commerce is oriented to more transaction processing, such as selling/buying activities.

Even though c-commerce could be considered as one of ramifications of electronically conducting commerce over the Internet, its emergence is most likely driven by the globalization of economy, the competition, the need for efficient customer response, and the advent of collaborative technology. From the managerial perspective, globalization means that decisions on allocation and/or acquisition of resources are considered and made on a global scale. Thus, international sourcing is commonly considered as an option for improving organizational performance, which subsequently necessitates the need for collaborative planning (Fliedner, 2003).

The fierce competition on global economy spurs businesses on to create strategic partnership with complementary enterprises in which creating collaborative advantage is as, if not more, important as creating competitive advantage (Spekman, Kamauff, & Myhr, 1998). The proliferation of strategic partnerships has resulted in the appearance of competition between business networks or between supply chains (Kumar, 2001). In this context, paradoxically, the fiercer the competition is, the more important collaboration becomes. Meanwhile, fierce competition redirected businesses' energies toward the fulfillment of customer's needs and the reduction of operating cost accrued through the supply chain (Fliedner, 2003). Finally, the availability of greater bandwidth of telecommunication facilitates the use of network and the Internet to connect businesses and create a collaborative platform on which "advanced planning systems" are employed to analyze and optimize the flows of supply chain (Kumar, 2001). In brief, the emergence of c-commerce could be driven by business needs and sophisticated IT capability.

BACKGROUND

Although inter-organizational collaboration has long been a commonly studied topic among researchers in the areas of business and public policy disciplines (Himmelman, 1996; Spekman, Kamauff, & Myhr, 1998), research in c-commerce is in its early stage and its findings have been sporadically published. Existing literature of c-commerce is focused on two themes (Chuang & Nakatani, 2004): (1) presenting successful anecdotes and potential benefits of c-commerce, and (2) describing the prescriptive features of c-commerce software or information technology infrastructures for building c-commerce. Exceptions to these two themes include Welty and Becerra-Fernandez (2001), Kumar (2001), and Chuang and Nakatani (2004).

C-commerce technology could be employed in the project that involves highly intellectual activities. For example, Boeing improved its production productivity from 228 airplanes per year in 1992 to 620 expected in 2002 by using collaborative e-marketplace (Fingar, 2001). In order to build a new family of supersonic stealth fighter planes in four years, Lockheed Martin Aeronautics Co. created a collaborative platform in which more than 80 suppliers located at 187 locations cooperatively designed and built components of the Joint Strike Fighter (Keenan & Ante, 2002). Additionally, c-commerce has changed the way firms in the food industry conduct business. For example, by using collaborative planning, forecasting, and replenishment (CPFR), Nabisco and Wegman's significantly increased sales revenue, service level, and market share (Walton & Princi, 2000). In the manufacturing sector, Microsoft and Flextronics created a Web-based collaborative system in which personnel from design, manufacturing, and engineering departments worked together to develop and test the prototype of Xbox video game console (Keenan & Ante, 2002). These cases demonstrate that c-commerce is generally employed in projects that involve knowledge exchanging and management. While efficiency and cost reduction are two major benefits of c-commerce, even more importantly, c-commerce facilitates product and process innovations or the reduction of cycle time.

Extant literature of c-commerce also placed an emphasis on the discussion of applications and IT infrastructure that support the development of c-commerce. Bellini, Gravitt, and Diana (2001) classified the enterprise application software for c-commerce into three categories: supplier relationship management, knowledge management, and product life-cycle management. Fou (2001) considers c-commerce as a continuum of applications of information technology, ranging from Web-enabled single-dimensional and single-process c-commerce, to B2B exchanges-based, single-dimensional and multiple-process c-commerce, to Web service-based, multiple-dimensional and multiple-process c-commerce. The Web service-based collaborative architecture consists of four tiers: c-commerce vendors, Web services, business rule engine, and multi-dimensional c-commerce enterprise Web portal.

While the above documents focus on the role of information technology, Derome (2000) emphasized that c-commerce capabilities should be illustrated from a functional standpoint. He defined c-commerce as a three-layer architecture: free-form collaborative services, process collaboration layer, and the structured data exchange category. The IT environment, duration of collaboration, and goal of collaboration vary from category to category. Likewise, Ramachandran and Tiwari (2001) studied the air cargo industry and proposed a collaborative supply chain consisting of connectivity layer, knowledge layer, and functionality layer that could offer better economic global air cargo services.

Additionally, several studies were focused on the importance of business strategy, collaborative models, and relational development. Mulani and Matchette (2002) proposed a product development life-cycle collaboration framework that ties the mutual strategic objectives of trading partners to actual inter-company execution. Li and Williams (1999) found that companies that had cooperated at the transactional level tended to develop a collaborative partnership at the strategic level. Welty and Becerra-Fernandez (2001) presented a business interaction model in which interaction technology (i.e., c-commerce software) is adopted to nurture mutual trust between partners and in which customer satisfaction is integrated into business processes. It is customer satisfaction rather than the delivery of goods or the payment that closes a business transaction loop. Chuang and Nakatani (2004) also emphasized the importance of trust and commitment in c-commerce. They asserted that existing inter-organizational relationship (IOR) and the level of trust between collaborators might affect the establishment, structure, and conduct of a c-commerce.

DEVELOPMENTAL PERSPECTIVE, APPLICATIONS, AND CURRENT ISSUES OF C-COMMERCE

The Roadmap of C-Commerce

Although extant literature of c-commerce documents numerous benefits and delineates a prescriptive form of c-commerce, there are several barriers, including trust issue between trading partners (Spekman, Kamauff, & Myhr, 1998; Welty & Becerra-Fernandez, 2001), existing relationship between prospective partners (Chuang &