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B2B E-Commerce -The Digital Opportunity

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Business to Business and Business-to-Consumer are two major types of e-commerce realization. B2B e-commerce holds the largest portion in e-commerce and has been growing rapidly during the past years. The B2B e-commerce is considered as more lucrative than B2C e-commerce since the B2B market is ten times larger than the B2C market and business consumers are generally less volatile than retail consumers. People may see consumer market as much bigger than the business (B2B) market place. In reality, however, B2B is much larger than the B2C markets. All trade industries, commercial markets, government organizations, non government organization or institutions are involved either directly or indirectly in the B2B transactions. Some firms such as Satyam, Reliance, SBI, TATA, IBM, Wipro, Logitech, Epson, HP, Canon, BHEL, LG, etc. focus completely on business markets, while some sell both to business markets and consumers. The B2B markets deal with organizational purchases of goods and services to support or facilitate production of other goods and services, either to facilitate daily company operations or for resale. Electronic payment is a financial exchange that happens online between organizational buyers and sellers in e-commerce. A productive digital market will facilitate the needs of electronic payment, thus reducing the operational and processing costs, decreasing technological costs, and speeding up the transactions.
Keyword: B2B, Electronic Commerce, Adoption, B2B Adoption

Introduction

Advances in information and communication technologies (ICTs, hereafter) are rapidly transforming business environment and the business practices through redefinition of markets, channels, products, and services. Every industry is affected by ICT-driven innovation. The underlying technologies of the Internet are providing a strong impetus to the creation of electronic markets, accelerating migration toward various forms of digital business and increasing the use of open systems within and among enterprises to achieve new forms of horizontal coordination and collaboration. Analogous transformations of services and delivery channels are taking place in public or not-for-profit industries such as education, government services, and healthcare.

The increasing globalization and use of the Internet technologies, accompanied with multiple resources, pose challenges to the modern management theories and success of entities in the market, accompanied with the number of emerging technologies which compete for integration within the current markets (Arns et al. 2002). These are coupled by the increasing competition within the markets on several criteria such as the five major operational performance objectives and several others. Not only this, the introduction of technology into firms has posed a big challenge as managers to sustain and strive a flatter hierarchy, in addition to maintaining a low cost budget and retention of the current employees simultaneously (Kotler and Armstrong, 2006).

B2B E-commerce

Electronic commerce refers to the conducting of business transactions over electronic/computer

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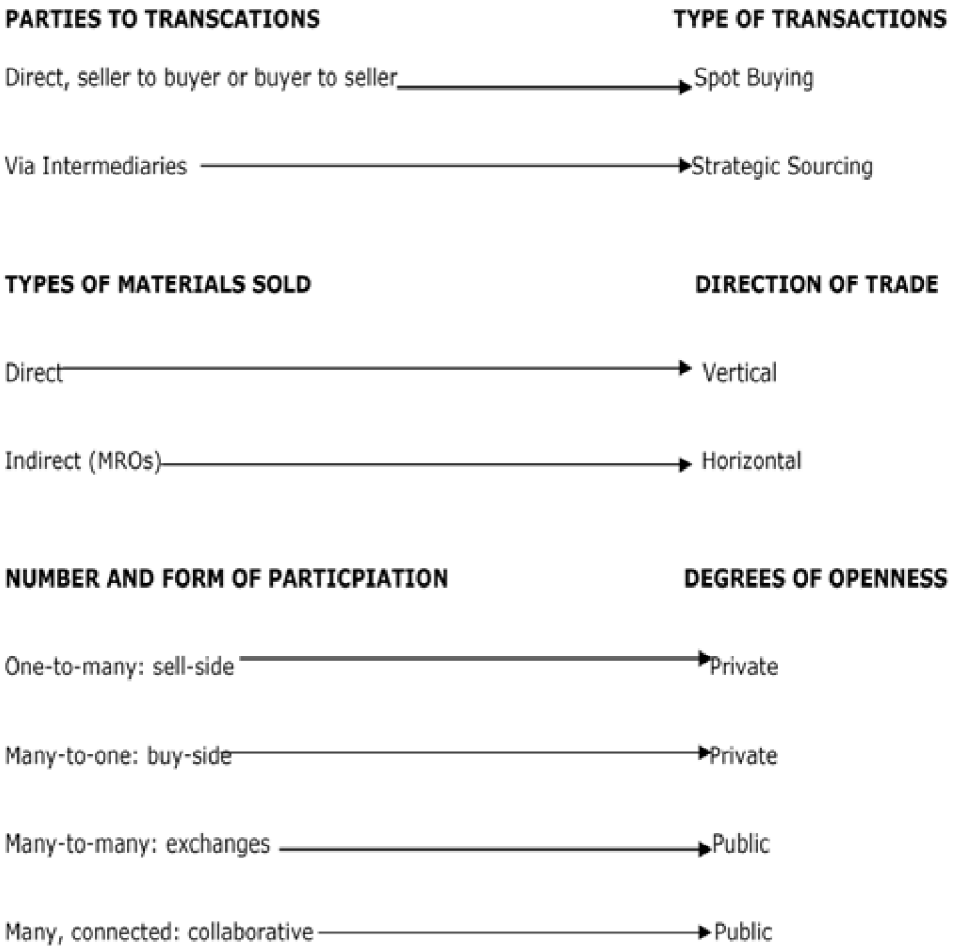
networks, including the internet, (Barnes and Hunt, 2001) and therefore encompasses processes related to the buying, selling and trading of products, services and information, (Gunasekaran et al. 2002).

There has been considerable promotion given to the use of e-commerce in B2C markets, where transactions involving such activities as personal banking, ordering goods, and share trading are becoming increasingly common. However, the use of e-commerce for B2B transactions has been widely identified as an area with significant potential for future revenue generation and

Figure 1 - Features of B2B E-commerce



The Basic B2B transaction types are as follows:

⇒ Sell-side: One seller to many buyers

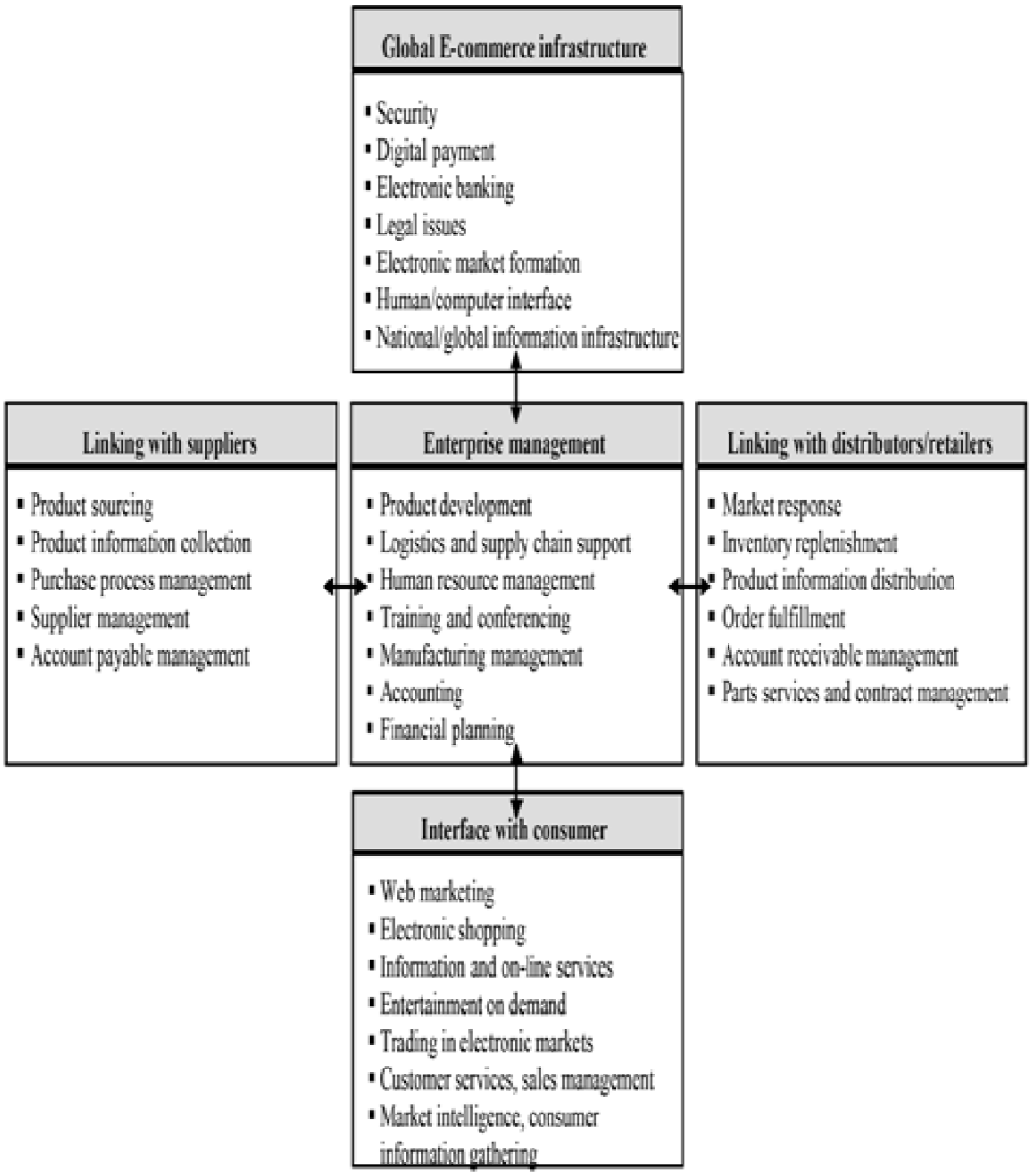
⇒ Buy-side: One buyer from many sellers

⇒ Exchanges: Many sellers to many buyers

⇒ Collaborative commerce: Communication and sharing of information, design, and planning among business partners.

cost savings (Barnes and Hunt, 2001). For businesses, B2B can mean electronic interaction with the members of supply base, i.e. for inbound procurement, and with customers for transactions pertaining to their procurement activity.

Figure 2 The scope of B2B E-commerce



Source: (Shaw, 2000)

Definition of B2B E-commerce

Since industrial and academic interest in B2B e-commerce is still evolving, any definition of what is or is not included in e-commerce is bound to be controversial. Westland and Clark (2000): "Electronic Commerce - or e-commerce - is the automation of commercial transactions using computer and communications technologies". Rebstock (1998) uses a similar broad definition, which says that electronic commerce summarizes all opportunities, which support

commercial transactions with electronic communication technologies. To narrow the definition commercial refers only to activities that create transactions between firms (business-to-business), excluding transactions between firms and individuals (business-to-consumers). These transactions involve the exchange of money, goods, obligations, information or ideas (Zwass, 1996; Guay & Ettwein, 1998; Bieberbach & Hermann, 1999; Standifird, 2001).

Shaw (2000) differentiates in two types of B2B e-commerce markets. One is related to the management of material flows in production oriented supply chain networks and the other is related to the procurement of maintenance, repair and operating (MRO, hereafter). His definition is focusing on physical material flows disregarding exchange of digital products, such as services or ideas. Contrary for Kollmann (1999), electronic marketplaces are defined as "virtual markets within a data network, where virtual business transactions take place, which are supported by information technology by the marketplace operator at any time of the transaction process". By virtual Kollmann means digital in contrast to physical marketplaces. Bakos (2002) is focusing in his definition of electronic marketplaces only on digital products, excluding physical product exchanges by relating an electronic marketplace to an "inter-organizational information system that allows the participating buyers and sellers to exchange information about prices and product offerings". Similar to Malone et al. (1987), Nokkentved (2000) is using a definition which says, that "the unique feature of a B2B exchange is that it brings multiple buyers and sellers together in a virtual sense in one central market space and enables them to buy and sell from each other at a dynamic price, which is determined in accordance with the rules of the exchange". Schmid (1991) builds on this definition, since in his view "the electronic marketplace contributes to the realization of the ideal economic market as an abstract place of exchange with complete information where transaction costs do not apply".

Hence B2B e-commerce covers a wide range of technologies and there is no standard definition. For the purposes of this study, we have defined B2B e-commerce as the process of deploying information and communication technologies to support the entire value chain from suppliers through the firm to customers (Pinkston, 2001). More traditionally, e-commerce has involved the use of EDI in which customers and supplier's computers are able to send formatted messages electronically. EDI has been the basis for early SCM systems. The Internet has opened up a new set of B2B applications. Moving beyond simple web-based ordering systems, customer relations management (CRM, hereafter) systems allow suppliers to help collaboration and cooperation with their customers (Peppers and Rogers, 2001; Thatcher et al. 2006). Some manufacturers are even providing customers with limited electronic access to their enterprise resource planning (ERP, hereafter) systems to provide them data on the production process and to allow for more advanced forms of electronic collaboration. What is important about these examples is that the CRM, SCM and ERP technologies are built on the foundation of mutual interdependence in the buyer-seller relationship (Chopra and Meindl 2001; Shore, 2000; Thatcher et al. 2006)

B2B E- Commerce- EDI to E-marketplace

Electronic business-to-business commerce has progressed through a number of phases, with the two key technologies being: EDI and the internet (Croom, 2005). In the 1960s and 1970s, mainframe solutions focused initially on internal automation and proprietary EDI links with suppliers. EDI allows for the electronic transmission of information and documents such as invoices or purchase orders between computer systems in different organizations based on a standard, structured, machine retrievable format (Sanchez and Perez, 2003). B2B e-commerce is not a new concept.

The heritage of Internet-based electronic commerce can be traced back to EDI (Electronic Data Interchange), which dates back more than twenty-five years. Either point-to-point or one-on-one linkages were developed or alternatively third party EDI communication service like VANs (Value Added Networks, hereafter) were developed and used, and to a certain degree they are still being used. (Lankford and Johnson, 2000) The VANs provide a variety of systems for exchanging information, enabled through a standard set of transactions. There is though a backside to these technologies. The cost of one-to-one EDI systems, or the service VANs provide, is of such magnitude that only the largest companies have been able to find the economic initiative to build and implement EDI systems with their most important suppliers or customers or to use the service provided by the VANs. The successor of the expensive VANs is the Internet. The principle of EDI - reducing the process costs of inter-company trade - will live on. The relative ease of accessing Internet for business and trade purpose, due to its dramatic lower cost, allows smaller suppliers and buyers to meet and through Internet, B2B e-commerce can reach its full potential. (Blodget and McCabe, 2000)

However, options of technology for conducting commerce electronically still include telephone, facsimile, electronic mail (email, hereafter), EDI together with the internet. Structuring their discussion of the impact of e-commerce on operations, (Gunasekaran et al. 2002) distinguish between the principal contemporary options - EDI, email and the internet. One of the first applications was Email to run on the internet and involves the direct transmission of text messages between two users. Using email provides the simplest form of e-commerce. It replaces paper, telephone and fax communication between members of a supply system (Beynon-Davies, 2004). It is uncomplicated and quick, but lacks the sophistication provided by EDI and internet mediated e-commerce solutions.

The Evolution of B2B E-commerce

The evolution of the B2B e- commerce is graphically illustrated in figure 1.3 and can be divided into four different phases (Phillips and Meeker, 2000); EDI networks, basic e-commerce, communities of commerce and collaborative commerce.

Phase 1- EDI Networks

EDI networks represented the first phase of electronic B2B commerce. EDI was designed to process high volumes of highly structured data and has had a major impact in reducing errors and shrinking processing time for certain types of transactions - but with significant costs. Moreover, EDI technology is brittle and difficult to change in a dynamic marketplace. Transactions must be defined according to standards published by the United Nations Standard Messages Directory for EDIFACT (Electronic Data Interchange for Administration, Commerce, and Transport) and transmitted in a predefined sequence. Each company had to spend time and money mapping each of its applications involved in commerce to conform to this predetermined standard. The mappings have to be kept up to date as systems and products change. The economics did not work for more fragmented industries without enough transactions to a given buyer to drive the investment throughout the supply chain.

More important, the point-to-point connections of EDI provided no community or market transparency. EDI networks routed transactions between buyer and seller, but the buyer had to know the seller already and the practice product to be ordered and there was no sense of marketplace or community. Therefore VANs were developed, which are third party EDI communication services. The VANs required all market participants to trade through their network using technically rigid, complex standards. VANs are efficient for transactions that fit the model but they are also very expensive.

However, batch-mode EDI transactions are expected

to have a long life. The key benefit is that orders can be automatically generated out of an ERP (Enterprise Resource Planning) system based on inventory replenishment rules. Many of these orders are more efficient without human interactions and are governed under long-term contracts. In the future, a blended model is expected to evolve in which EDI transactions check preselected sources in an exchange before generating an automatic replenishment order (Sandberg and Westerberg, 2001). Moreover, many of the EDI networks are expected to move their network participants to a marketplace metaphor over time.

Phase 2 - Basic E-commerce

Phase 2 initiated basic e-commerce between buyers and one seller without an intermediary. A few early adopters began publishing their Web sites as a primary sales channel. The early adopters were largely technology companies with technology-savvy customer and little or manageable channel conflict. Phase 2 for most companies was about displaying catalogue content and publishing marketing collateral.

Phase 3 - Communities of Commerce

Phase 3 represents the rise of third-party Web destinations, i.e. B2B electronic marketplaces that bring together trading partners into a common community. Communities of enterprises create market transparency. Once buyers and sellers start regularly arriving at a common destination, all sorts of possibilities arise. The intersection of buyers and sellers, many-to-many, online with related interests creates an opportunity to serve a larger percentage of those interests.

Phase 4 - Collaborative Commerce

Collaborative commerce builds on phase 3 by adding support for other business processes before, during, and after the order. The broad range of interactions that make the chain of commerce work can also be moved online. Collaborative commerce is a more complete reflection of the complex workflow between demand and supply chains.

Table 1 - The four phases of B2B E-commerce

	Phase 1	Phase 2	Phase 3	Phase 4
Flexibility	Low; rigid format	High; open standard	High; open standard	High; open standard
Costs	High; proprietary network	Low; leverage Internet	Low; leverage Internet	Low; leverage Internet
Business process Supported	Batch orders	Catalogue orders	Catalogue plus Action and Bid	Multiple order forms; B2B interactions
Market transparency	Low; fixed/** supplier base	Low; no centralised market	High; inter-geography transparency	High; inter-geography transparency

Source: (Phillips and Meeker, 2000)

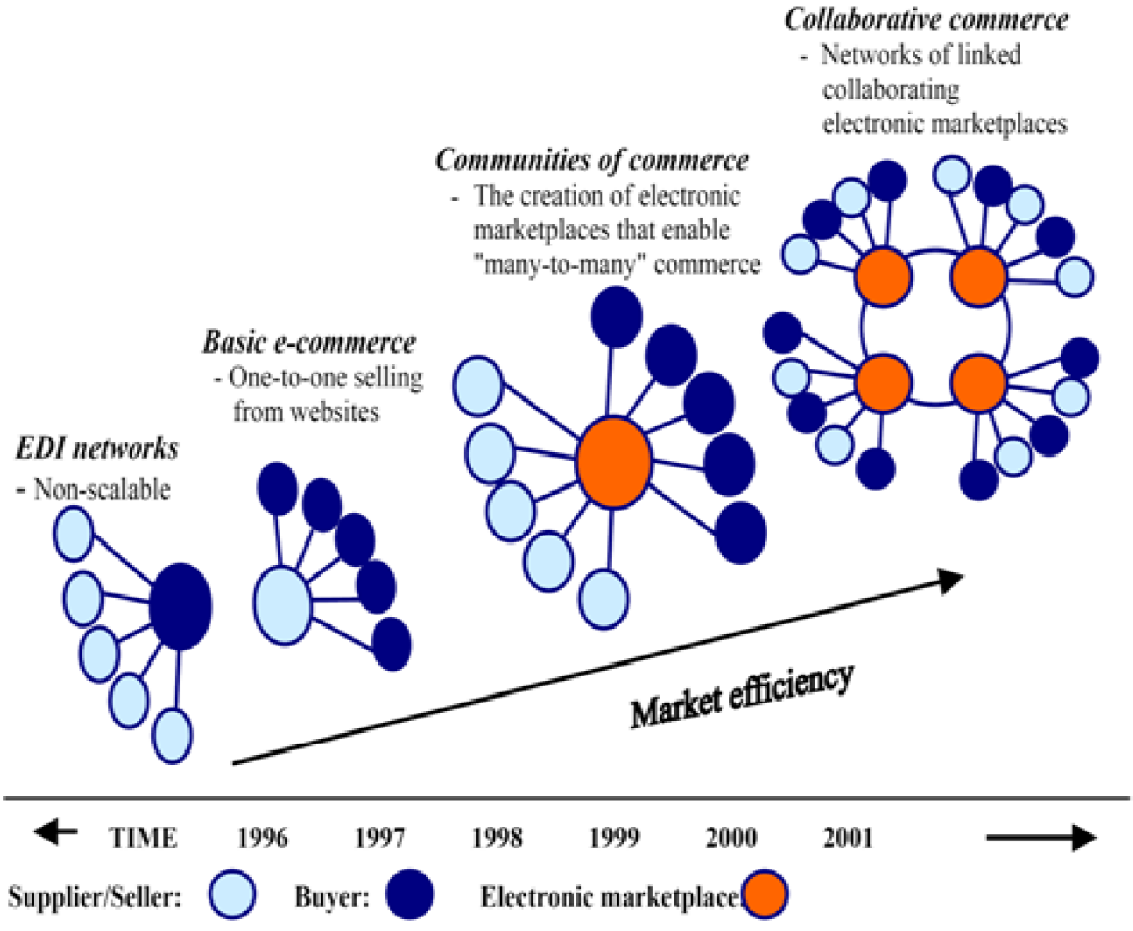
But it also accounts for the broad range of interactions, beyond the order, spawned from the chain of commerce (Sandberg and Westerberg, 2001). Table 1.1 compares the different phases in the evolution of B2B e-

commerce related to flexibility, costs; business process supported and market transparency.

B2B E-commerce Adoption

E-commerce is defined as the sale and purchase of products and services by electronic means such as Internet. Researchers also believe that e-commerce on the Internet goes beyond simply selling and buying electronically as it involves a broad variety of pre and post-sales activities, such as maintaining business relationships, advertising, and enhancing business communication (Zwass, 1996). At the core of e-commerce, however, is the use of electronic means to improve efficiencies in business processes within and across organizations and expedite commercial transactions. The e-commerce adoption is a reflection of the strategic orientation of an organization, and can be characterized by the extent of interactions such as exchanges of communication, information, distribution, transactions and/or collaboration) in the business process (Cullen and Taylor, 2009). An organization can be using e-commerce currently, or plan to use it in the future later (Thong, 1999; Teo and Tan 1998). From the literature, a six-phase e-commerce status indicator, relevant to the e-commerce realities of developing nations, was defined: no e-commerce, connected e-commerce, static e-commerce, interactive e-commerce, transactive e-commerce and integrated e-commerce (Molla and Licker, 2005). Many researchers have accepted interactive e-commerce as the beginning of e-commerce. Therefore, a business was defined as having adopted e-commerce if it has attained an

Figure 3 A overview of the evolution of B2B E-commerce



Source: (Phillips and Meeker, 2000)

interactive e-commerce status and the extent of e-commerce utilization was operational zed by looking into whether an organization had attained an interactive, transactive, or integrated status. The adoption extent of each electronic network can be measured according to the criteria proposed by (Molla and Licker, 2005; Lertwongsatien and Wongpinunwatana, 2003; Limthongchai and Speece, 2003)

Stages in the Adoption and Use of E-commerce

The life cycle of integrated-enterprise system implementation has been separated into the phases of design, test, realize, and improve (Ho and Lin, 2004). This breakdown is relevant here because it separates the on-going use of the system from the earlier more project-oriented design, buy and install phases. During the final "improve" phase, which runs the system from the going-live point and is thus indeterminate in duration, system performance is monitored and fine-tuned, and the associated businesses processes are adjusted as necessary. Taking a similar perspective, Loh and Koh (2004) break down the implementation process for an ERP system into four phases, beginning with a "chartering" phase which deals with the decisions prior to the selection of a system and with planning and scheduling. The "project" phase consists of system configuration and rollout, and is followed by the "shakedown" phase during which the implementation moves from going-live to normal operation. Finally, and of most relevance to this work, is the "onward and upward" phase which lasts until system replacement or upgrade and incorporates ongoing maintenance, enhancement of the system and of related business processes (Filiatrault, 2007). These two studies are technically oriented and do not adopt a wider use perspective. However, and despite their differences in the precise definitions of life cycle phases, they are useful in delineating the stages of implementation of (e-commerce) systems. Most importantly, they acknowledge the existence and importance of the phase(s) of system implementation that occur post going-live, to which this research relates.

Most previous research on e-commerce (or related system) adoption has tended to focus on the earlier project-like phases of implementation, which are of determinate duration, rather than on the later phase once the system has been installed and is in regular use. They generally fail to deal with the "post installation infusion stage of Internet-enabled commerce" (Rosenzweig and Roth, 2007, p. 1313). Examples of such Operation Management-based studies include investigation of the contextual factors that influence the decision to adopt or not, and the extent of adoption of particular technologies in the United Kingdom healthcare sector (Bakker et al. 2008); the factors that influence the decision to adopt internet-based processes for e-transactions by service firms (Tsikriktsis et al. 2004) and the differences between early, late and non-adopters of online reverse auctions (Schoenherr, 2008). That is not to say that the on-going use phase has been neglected completely: in work that considers not only the initial implementation of a new technology (ERP in this case), but also the on-going effects of its use, Bendoly and Schoenherr (2005) suggest that ERP is not simply a tool that provides a single output but rather an infrastructure that supports other information-related capabilities of a firm.

Lawson et al. (1998) explored different stages, as depths, of involving electronic means in businesses. At stage one, promotion; businesses are mainly using electronic channels to promote their products and service. During stage two, provision, the interaction between the business and its customer will increase as well as the depth of knowledge that is interacted with third parties such as customers. Stage three; processing is about full ennoblement of communication and information channels between parties involved in buyer-supplier relationship. Stage 3 brings more integration

into the perspective of business relationships.

Barua et al. (2001) suggest that before implementing e-business, senior managers must understand well the nature of information technology (IT), business processes, and e-business readiness along their business value chain. E-commerce as a subset of e-business (Chaffey, 2007) needs the same attention to be paid to. Further, they should clearly discover e-business drivers in their companies, which include business processes, IT applications (customer orientation, supplier orientation and internal orientation), and systems integration.

Conclusion

A developing country can become modernized and industrialized if it can extensively apply IT to enhance productivity and international competitiveness, develop e-commerce and e-governance applications. An information-based society or knowledge based society is composed of IT products, IT applications in society and economy as a whole. Many nations in Asia are taking advantage of e-commerce through opening of economies, which is essential for encouraging competition and diffusion of Internet technologies. The Internet is promoting efficiency and enhancing market integration in developing countries. The broadband policy envisages 40 million Internet subscribers in India by the end of 2010 and 20 million broadband subscribers. As of April 2009, the country had around 48 million Internet subscribers, inclusive of Mobile Internet. Internet users which will equal, if not exceed, many of the developed countries. Internet economy will then become more important in India. The number of e-transactions will be large enough to preserve the Internet economy.

The broad application of B2B e-commerce solutions has opened new alternate channels for firms to transact and communicate with each other, and has encouraged the emergence and evolution of a great number of electronic exchanges and firms that can provide innovative technology and service support. The rapid development of B2B e-commerce engenders our inquiry about the nature of this innovative form of business.

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