Business-to-Business (B2B) Internet Business Models - 2008

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Nature of B2B E-Commerce

B2B Business Models by Ownership
- Direct Selling
- Direct Buying
- Exchange/Trading Mall

B2B Business Models by Transaction Methods
- Electronic Catalogs
- Automated RFQs
- Digital Loyalty Networks
- Metacatalogs / Directories
- Order Aggregation
- Auction
- Bartering

Merits and Limitations of B2B E-Commerce
- Merits of B2B e-Commerce
- Limitations of B2B e-Commerce and Possible Solutions

Critical Success Factors for B2B E-Commerce

B2B E-Commerce Enables Technologies and Services

The Road Ahead

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NATURE OF B2B E-COMMERCE

Business-to-business (B2B) e-commerce refers to transactions between business entities conducted electronically via Internet, extranet, intranet, and/or private networks. B2B commerce existed before, with private telecommunication networks. These networks require costly investments in infrastructure and operation. With the advent of Web-based technologies, data communication over the Internet has become affordable for many businesses, maximizing the efficiency of their business communication internally as well externally. Together with business-to-consumer (B2C) e-commerce, one observes booming B2B e-commerce in the e-marketplace. There are many business model scheme to classify framework and practice for a sustained business entity. A business model describes who in the market segment are served in which goods/services, how these goods/servies being produced and how the business plan to make revenue (Chaudhury & Kuilboer, 2002, Afuah & Tucci, 2003). This chapter describes various models in which B2B e-business could benefit for its procurement/acquisition functions (Neef, 2001), effectively manage its supply chain and customer relationship. From this perspective, B2B e-commerce can be classified according to the nature of the goods/services in transaction, the procurement policy, and the nature of the supply chain.

Businesses conduct B2B e-commerce to sell or buy goods and services for production and/or nonproduction. *Production materials,* or direct materials, go directly to the production of goods or services. Usually they are not shelf items that could be readily purchased at anytime in the marketplace. Their use is scheduled according to a production plan. They are purchased in large volume after negotiation and contracting with the sources to guarantee a continuous stream of input materials for the production process. *Nonproduction materials,* or indirect materials, are used in maintenance, repairs, and operations. They are also called MROs, containing low-value items. Although constituting about 20% of purchase value, they amount to approximately 80% of an organization's purchased items. Aberdeen Group Research find that most enterprise apply disciplined sourcing methods to only one third of their total spending. Consequently, it costs US firms more than $134 billion each year in missed supply saving opportunities (perfect.com, 2007).

Depending on the strategic nature of the materials in the production, a procurement policy may involve a long-term contract or an instant purchase/rush order. *Strategic sourcing* for a long-term contract results from negotiations between suppliers and buyers. *Spot buying* (or *maverick purchase*) for an instant purchase/rush order concludes at a market price resulting from the matching of current supply and demand. Due to the strategic role of direct materials in the production, a manufacturer wishes to secure a consistent long-term transaction at an agreed upon price with its suppliers. Most organizations spend a great deal of time and effort for upstream procurement of direct materials, usually high-value items, and overlook low-value items, including MROs. Consequently, there are potential inefficiencies in the procurement process, such as delays in production due to insufficient MROs and/or overpayment for rush orders to acquire these MROs.

From a value chain and supply chain perspective, B2B e-commerce can take place in a vertical market or a horizontal market. A *vertical market* involves transactions between and among businesses in the same industry or industry segment. Usually this market deals with the production process or direct materials necessary for the production of goods and services of firms in the same industry. A *horizontal market* involves transactions related to services or products of various industries. These materials are diversified and related to the maintenance, repair, and operation of a specific firm. Most of these materials do not contribute directly to the production of goods and/or services offered by the firms.

Before the advent of B2B e-commerce, companies used the following tendering process. A department in a company submits a requisition for the goods/services it needs. The purchasing agent prepares a description of the project, giving its specification, quality standards, delivery date, and required payment method. Then the purchasing department announces the project and requests proposals via newspaper/trade magazine ads, direct mail, fax, or telephone. Interested vendors/suppliers may ask for and receive detailed information by mail. Then these suppliers prepare and submit proposals. Proposals are evaluated by several departments/agents at the buying company. Negotiation may take place and the contract is awarded to the supplier who offers the lowest price. In this process, communication mostly takes place via letter or fax/phone.

Similarly on the selling side, a supplier announces in newspapers or trade magazines the inventory to be disposed of and invites interested parties to inquire and bid. A sales force may be set up to identify and make direct contact with potential buyers. The interested parties may request additional information about the goods to be delivered by mail or fax. Then they decide to submit a sealed bid by mail. At the closing date, the bids are examined and the highest bid wins the auction.

This manual and paper-based process takes a long time and is prone to error. Electronic processes conducted via telecommunication systems are faster but require an investment in a dedicated private network. Recently, Web-based technologies have made business communication much less expensive and easier to administer. Transactions over the Internet also make it possible to reach a larger pool of business partners and to locate the best deal for the project.

There are many classification schemes for B2B e-commerce business models (Pavlou & El Sawy, 2002; Laudon & Traver, 2007; Turban et al., 2008). The classifications provide details on the context and constraints of the various business models so that an interested business may select an appropriate strategic choice to gain a competitive advantage. In the following, B2B e-commerce business models are classified on the basis of business ownership and transaction methods.

B2B BUSINESS MODELS BY OWNERSHIP

Depending on who is controlling the marketplace and initiating the transactions, B2B e-commerce can be classified as a company-centric model operating in a private e-marketplace or an exchange model operating in a public marketplace.

A *company-centric model*, representing a one-to-many business relationship, involves one business party initiating transactions and deals with many other parties interested in buying or selling its goods and services. In a *direct-selling* model, a company does all the selling to many buyers, whereas in a *direct-buying* model a company does all the buying from many suppliers.

In these models, the initiative company has complete control over the supportive information systems. However, a third party may serve as an *intermediary* to introduce buyers to sellers and vice versa, and to provide them with a platform and other added-value services for transaction. In many cases, buyers and suppliers having idle capacity in their Internet host sites for B2B e-commerce have served as intermediaries for other smaller businesses.

An *exchange or trading model*, representing a many-to-many business relationship, involves many buyers and many suppliers who meet simultaneously over the Internet to trade with one another.

Usually there is a market maker who provides a platform for transactions, aggregates the buyers and sellers, and then provides the framework for the negotiation of prices and terms.

A variation of the exchange model is a *consortium trading exchange*, which constitutes a group of major companies that provide industry-wide services that support the buying and selling activities of its members. The activities can be vertical/horizontal purchasing/selling.

Direct Selling

This is a company-centric B2B model focusing on selling, in which a supplier displays goods and services in a catalog at its host site for disposal. The seller could be a manufacturer or a distributor selling to many wholesalers, retailers, and businesses.

In this model, a large selling company transacts over a Web-based, private-trading sales channel, usually over an extranet, to its business customers. A smaller business may use its own secured Web site. The company could use some transaction methods, such as direct selling from electronic catalogs, requests for proposal (RFP), and selling via forward auctions, and/or one-to-one dealing under a long-term contract. The classification of these transaction methods in B2B e-commerce is discussed in detail in the next section.

In the B2B direct selling, the involved parties may benefit from speeding up the ordering cycle and reducing errors processing. They also benefit from reducing order processing costs, logistics costs, and paperwork, especially the reduction of buyers' search costs in finding sellers and competitive prices and the reduction of sellers' search costs in advertising to interested buyers.

Most major manufacturers have conducted B2B e-commerce with their business partners. For example, *Dell.com*, *Cisco.com*, and *Staples.com* among others, have special secured sites for registered partners to provide them with information on products, pricing, and terms. At this site, business customers can browse the whole catalog, customize it, and create and save a shopping list/shopping cart for internal approval before placing orders. The sites have the tracking facility for customers to follow up on the status of their orders. These sites also have links to shipper's Web site (UPS, FedEx, Airborne Express, etc.) to help customers keep track of delivery.

In this model, depending on whether a manufacturer/distributor, that hosts its own Web site and support, provides complete transaction or not, the company may have to pay fees and commissions to intermediaries for hosting and value-added services. Usually, corporate buyers have free access to the e-marketplace after a free registration to the site.

Direct Buying

This is a company-centric B2B model focusing on buying, in which a company posts project specifications/requirements for goods and services in need and invites interested suppliers to bid on the project.

In this model, a buyer provides a directory of open requests for quotes (RFQs) accessible to a large group of suppliers on a secured site. The buying company doesn't have to prepare requests and specifications for each of these potential tenders. Suppliers could be notified automatically with an announcement of available RFQs, or even the RFQs sent directly from the buyer site. Independent

suppliers can also use search-and-match agent software to find the tendering sites and automate the bidding process. Then suppliers can download the project information from the Web and submit electronic bids for projects. The reverse auction could be in real time or last until a predetermined closing date. Buyers evaluate the bids and negotiate electronically and then award a contract to the bidder that best meets their requirements. A large buying company can also aggregate suppliers' catalogs at its central site for the ease of access from its own branch offices. These affiliations will purchase from the most competitive supplier. In this case, the suppliers will be notified directly with the invitation for tender or purchase orders.

This model streamlines and automates the traditional manual processes of requisition, RFQ, invitation to tender, issue of purchase orders, receipt of goods, and payment. The model makes the procurement process simple and fast. In some cases, it increases productivity by authorizing purchases from the units/departments where the goods/services are needed and therefore bypassing some paperwork at the procurement departments. The model helps in reducing the administrative processing costs per order and lowering purchase prices through product standardization and consolidation of orders.

The model also contributes to improving supply chain management by providing information on suppliers and pricing. It helps to discover new suppliers and vendors who can provide goods and services at lower cost and on a reliable delivery schedule. It also minimizes purchases from noncontract vendors at higher prices for uncontrollable quality goods/services.

In this model, a buying company may set up its own Web site and may engage other services from intermediaries with licenses. Suppliers have to register at the host site and may have to pay an access fee.

An example of this model is GE's Trading Process Network, where the company sourcing department receives internal material requests and sends off RFQs to external suppliers. The network was opened to other business partners, and being evolved into a major independent B2B service provider *gxs.com*

Exchange/Trading Mall

The exchange model involves many suppliers and buyers meeting at the marketplace for transactions. The marketplace could be a dedicated site or a trading mall open to the public. Transactions in this marketplace involve spot buying as well as negotiation for a long-term buying/selling contract. In spot buying, a deal is concluded at a price based on supply and demand at any given time at the marketplace. In systematic sourcing, the exchange aggregates the buyers and sellers and provides them with a platform for the negotiation of prices and terms.

In the exchange, a company lists a bid to buy or an offer to sell goods/services. Other sellers and buyers in the exchange can view the bids and offers, although the identity of the tenderer or the bidder is kept anonymous. Buyers and sellers can interact in real time, as in a stock exchange, with their own bids and offers to reach an exact match between a buyer and a seller on price, quantity, quality, and delivery term. Third parties outside the exchange may provide supporting services, such as credit verification, quality assurance, insurance, and order fulfillment.

The exchange provides an open marketplace so that buyer and seller can conclude/negotiate the transaction at a competitive price resulting from the supply/demand mechanism. It has the characteristics and benefits of a competitive market in terms of classic economics. A buyer may

benefit from lower costs due to a large volume of goods/services being transacted. A supplier may benefit from reaching a larger pool of new buyers than is possible when conducting business in a traditional market.

Using this business model, *alibaba.com* has more than 3.6 million registered members in more than 200 countries and regions exchanging millions of product and supplier listings in over 5,000 product categories and 30 industry categories (alibaba.com, 2008). Another example is Global Healthcare Exchange (*ghx.com*) transacting among 250 healthcare manufacturers and over 3,600 providers (gxh.com, 2008)

In this business model, some exchanges act purely as information portals by transferring the order/inquiry to the other party via hyperlinks so that the transactions will take place at the seller/buyer sites. Others aggregate suppliers and/or buyers for the convenience of the trading parties. In supplier aggregation, the exchange standardizes, indexes, and aggregates suppliers' catalogs and then makes them available to buyers at a centralized host site. Or requests for proposals (RFPs) from participant suppliers are aggregated and matched with demand from participant buyers. In buyer aggregation, RFQs of buyers, usually the small ones, are aggregated and linked to a pool of suppliers that are automatically notified of the existence of current RFQs. Then the trading parties can make bids.

Another type of exchange is called a *consortium trading exchange*, formed by a group of buyers or sellers. In *buying consortia*, a group of companies joins together to streamline the purchasing process and to pressure the suppliers to cut prices and provide quality, standardized goods/services in vertical as well horizontal supply chain transactions. An example of buying consortium is *Covisint.com*, initially a joint venture in automotive industry by General Motors, Ford, DaimlerChrysler, Renault, Peugeot-Citroen and Nissan. Later this consortium evolves and provides global trading services for automotive and health care industries so that companies can share information on purchasing, planning and scheduling, materials management, transportation and logistics, invoicing and settlement. In *selling consortia*, suppliers in the same industry deal with other downstream businesses to maintain reasonable prices and controllable production schedules for goods/services in vertical trading. An example of a selling consortium is the *StarAlliance.com*, an alliance of major domestic and international airlines, consisting of Air Canada, Air China, Air New Zealand, Lufthansa, SAS, Singapore Airlines, United Airway, US Airways and others. These companies sell or exchange seats in their airplanes to one another to assure full booking for their fleets.

The use of exchange would especially benefit smaller businesses, which don't have large customer bases or supplier sources. Transactions via exchange and intermediary sites don't require additional resources for information technology infrastructure, staffing, and other related costs. If the exchange is controlled by an intermediary, this third party often assumes the responsibility for credit verification, payment, quality assurance, and prompt delivery of the goods.

There are intermediary exchanges, such as the Trading Grid of Global eXchange Services (*gxs.com*), that provide an open marketplace for many suppliers/vendors and buyers. In other cases, manufacturers provide upstream and downstream partners with a service enabling them to do business with one another.

One prominent example is Boeing's secured site *MyBoeingFleet.com*, at which Boeing's airline customers can access the PART page to order maintenance parts (about 6.5 million spare parts) directly from Boeing's suppliers. This service significantly streamlines time and labor in the procurement process for all business partners. One no longer needs to go through archives to look for blueprints, specifications, and sources of thousands parts of an aircraft for the requisition of a specific item.

On the revenue models of exchanges, if a major partner of the supply chain owns the site, access to an exchange marketplace could be free of charge. In other cases, participants pay an annual registration fee and/or a transaction fee that is either a fixed amount or a percentage of the transaction volume. The participants may also pay for added-value services, such as credit verification, insurance, logistics, and collection, provided by the exchange. Some exchanges generate extra revenue from online advertisements on the site.

B2B BUSINESS MODELS BY TRANSACTION METHODS

B2B business models could be classified by the transaction methods a buying/selling company uses to conduct business with its partners in the e-marketplace. A company may use one or many transaction models suitable for its transactions.

Table 1: B2B e-Commerce Business Models

BY TRANSACTION METHODS	**BY OWNERSHIP**		
	PRIVATE		**PUBLIC**
	Direct Selling	**Direct Buying**	**Exchange**
Electronic catalogs	•		
Automated RFQs		•	
Digital loyal networks	•	•	
Metacatalogs / Directories		•	•
Order aggregation		•	•
Auction	•	•	•
Bartering			•

Electronic Catalogs

Using this model, a supplier posts an electronic version of its catalog in a Web site for free access from interested parties. The company benefits from exposure to a large pool of potential buyers over the Internet without the costly creation and distribution of voluminous catalogs. The electronic catalog can be updated in a timely manner. Most companies have this model as a supplementary to their paper-based catalogs to reach more customers outside their physical facilities. The transactions incurred may be handled with a traditional procurement process.

In this passive and low-cost business model, a supplier could inform potential buyers of the existence of the catalogs via regular mail or e-mail. The supplier may also register the Web site in the directories of some exchanges or intermediaries. Using a search engine, interested buyers may discover the competitive offer and then contact the supplier directly for further information about products and services.

Automated RFQs

In this model, requests for quotes (RFQ) are automatically distributed from the buying company to its business partners via a private communication network. The sourcing department receives requisitions electronically from other departments. It sends off RFQs containing specifications for the requisitions to a pool of approved suppliers in the network via the Internet. Potential suppliers around the world are notified of incoming RFQs almost immediately, instead of within days and weeks, as in the traditional paper-based system. Suppliers have a few days to prepare bids and to send them back over the extranet to the buying company. The bids are then routed over the intranet to the appropriate purchasing agents and a contract could be awarded on the same day. Because the transactions are handled electronically, invoices are automatically reconciled with purchase orders and human errors in data entries/processing are minimized accordingly.

Having automated RFQs, sourcing cycle time in the acquisition process is reduced significantly, with the distribution of information and specifications to many business partners simultaneously. It allows purchasing agents to spend more time negotiating for the best deal and less time on administrative procedures. A company also consolidates a partnership with suppliers by buying only from approved sources and awarding business based on performance. Consequently, it allows the company to acquire quality goods and services from a large pool of competitive suppliers around the world.

With the advent of Web-based technology, networking becomes affordable and cost effective for interested businesses. A smaller company can engage an intermediary, or Web-service provider, to alleviate the cost of building and maintaining a sophisticated transaction network.

Digital Loyalty Networks

As in traditional business, highly valued business partners in B2B e-commerce may get special treatment. In this model, a B2B e-commerce Web site differentiates visitors by directing the valued ones to a special site, instead of trading in a public area opened for other regular business partners. The system may also direct special requests/offers to a preferred group of business partners.

Using this business model, different RFQs will be sent to different groups of potential suppliers from the approved supplying source for the company. A business may differentiate between its suppliers based on past performance in terms of product quality, pricing, delivery, and after-sales services.

Similarly, a selling company may reward its preferred buyers with special discounts and conditions on transactions.

Metacatalogs / Directories

In this model, catalogs of approved suppliers are aggregated, indexed so that buyers will have the opportunity to deal with a large pool of suppliers of goods/services. These metacatalogs are usually kept in a central site for ease of access to potential buyers. Using this model, a global company may maintain a metacatalog of suppliers for the internal use of its branches. Or a trading mall can keep a metacatalog for the wide public access.

For the internal use of a global company, the model aggregates items of all approved suppliers from their catalogs into one source. Buyers from affiliated firms or branches can find the items in need, check their availability and delivery time, and complete an electronic requisition form and forward it to the selected supplier. In this transaction, prices could be negotiated in advance. Potential suppliers tend to offer competitive prices, as they would be exposed to a larger pool of buyers, in this case the world-wide affiliations/branches of the buying company. In addition, suppliers may become involved in a long-term relationship with a global company and its affiliations/branches. The listing in the metacatalog is free to the suppliers as a result of the negotiation of terms and prices for the goods/services to be provided to the buying company.

For wide public access, an intermediary or a distributor will create metacatalogs and make them available for its clients. Because buyers have an opportunity to deal with a large source of suppliers, these suppliers are under pressure to compete with one another in terms of price, quality, and services to win business. In this model, the supplier may have to pay a fee for listing on the catalog and/or a commission as a percentage of the transaction value. The buyer may have a free access or may pay a membership fee to the host/distributor.

An example of this model is Thomas Global (*thomasglobal.com*) having a directory of 700,00 manufacturers and distributors, classified by 11,000 products and services categories across 28 different countries, could be search in 9 different languages (thomasglobal.com, 2008).

Order Aggregation

In this model, RFQs from buyers are aggregated and sent to a pool of suppliers as invitations to tender. The order aggregation could be internal or external. In an internal aggregation, company-wide orders are aggregated to gain volume discounts and save administrative costs. In an external aggregation, a third party aggregates orders from small businesses and then negotiates with suppliers or conducts reverse auctions to reach a deal for the group. Usually, an intermediary will aggregate RFQs of participant buyers and match then with requests for proposals (RFPs) from participant suppliers.

In order aggregation, small buyers benefit from the volume discount through aggregation that could not be realized otherwise. Similarly, suppliers benefit from providing a large volume of goods/services to a pool of buyers and save the transaction costs incurred from dealing with many, fragmented buyers. Order aggregation works well, with defined indirect production materials and services having relative stable prices. In this model, if the order aggregation is undertaken by an

intermediary, then involved business parties may have to pay a flat fee and/or a commission on the transaction value.

Auction

To reach a deal, business partners involved in B2B could use auction and/or matching mechanisms. A *forward auction* involves one seller and many potential buyers. A *reverse auction* involves one buyer and many potential sellers. In *double auction*, buyers and sellers bid and offer simultaneously. In *matching*, related price, quantity, quality, and delivery terms from the bid and ask are matched. The auction can be in real time or last for a predetermined period.

In a buying-side marketplace, a buyer opens an electronic market on its own server, lists items in need, and invites potential suppliers to bid. The trading mechanism is a *reverse auction*, in which suppliers compete with one another to offer the lowest price. The bidder who offers the lowest price wins the order from the buyer. Other issues, such as delivery, schedule, and related costs, are also taken into account when awarding contracts to bidders.

In a selling-side marketplace, a seller posts the information for the goods/services to be disposed and invites potential buyers to bid. The trading mechanism is a *forward auction*, in which participating buyers compete to offer the highest price to acquire goods/services in need.

The transaction can also take place at an intermediary site, at which buyers post their RFQs and suppliers post their RFPs. Depending on the regulations of the auction site, bidders can bid either only once or many times. In the latter case, bidders can view current supply and demand for the goods/services and change their bids accordingly. The transaction concludes when bidding prices and asking prices are matched. The involved business parties may have to pay an access fee. In addition, sellers may have to pay a commission on transaction value.

Bartering

In this model, a company barters its inventory for goods/services in need by announcing its intention in a classified advertisement. Actually, a company rarely finds an exact match by itself. The company will have a better chance if it joins an e-commerce trading mall, as it could reach a larger pool of interested parties over the Internet.

An intermediary can create a bartering exchange, at which a company submit its surplus to the exchange and receives credits. Then it can use these credits to buy the items in need from the stock of goods/services listed for bartering at the exchange. Business parties using an intermediary site may have to pay for a membership fee and/or a commission on the transaction volume.

An example of this model is *itex.com*, providing a marketplace for cashless business transactions in North America. This marketplace processed over $250 million a year in transactions across 24,000 member businesses and more than 95 franchises and licenses (itex.com, 2008)

MERITS AND LIMITATIONS OF B2B E-COMMERCE

Along with other business models in the e-marketplace, B2B e-commerce has been welcomed as an innovative means of conducting transactions over the Internet. These business models promise not only effective and efficient business operations/transactions, but also competitive advantages to early adopters.

According to Forester Research, in 2005 most large business - having one to five thousand employees - and global firms - more than 20 thousand employees - adopt online procurement (ariba.com, 2007). 56% of large firms and 67% of global firms purchase goods and/or services using browser-based tools; 34% of large firms and 53% of global firms purchase using web-based integration with suppliers' systems; 40% of large firms and 51% of global firms use online sourcing products to choose suppliers (ariba.com, 2006).

As a result, according to AMR Research on Supply Chain Top 25 for 2005, benchmarking data show that demand-driven supply network leaders carry 15% less inventory, are 60% faster-to-market and complete 17% more perfect orders (gxs.com, 2008).

Some B2B service providers claim that using their B2B enabling technologies and services business customers reduce spot buying by 34% and increased spend under management by 30% (ariba.com, 2006). Business customers benefited from more than 15% reduction in costs, and up to 75% reduction in cycle time (perfect.com, 2007)

Although having certain merits, these business models encounter some limitations that hinder the effective and efficient implementation and operation of a sustainable business. However, there are many possible solutions for overcoming these limitations.

Merits of B2B e-Commerce

B2B e-commerce in general exposes a selling/buying company to a larger pool of suppliers and corporate buyers. Transactions over the Internet help overcome the geographical barrier, bringing business partners from all over the world to the e-marketplace. A company may benefit from transactions with business partners beyond the local market.

The Web-based technology of e-commerce helps minimize the human error found in the paper-based activities and supports timely, if not real-time, communication between and among partners. Different from traditional, costly telecommunications networks, Web-based technology makes transactions over the Internet affordable to most businesses involved in the e-marketplace. Also, the existence of many intermediaries also provides interested businesses with low-cost solutions for implementing a B2B e-commerce model.

B2B e-commerce models address the concerns about the effectiveness and efficiency of the supply chain management of business partners---suppliers as well as company buyers. Supply chain management coordinates business activities from order generation, order taking to order distribution of goods/services for individual as well as corporate customers (Kalakota & Robinson, 2001). Interdependencies in the supply chain create an extended boundary that goes far beyond an individual

firm, so that individual firms can no longer maximize their own competitive advantage and therefore profit from cutting costs/prices. Material suppliers and distribution-channel partners, such as wholesalers, distributors, and retailers, all play important roles in supply chain management. B2B e-commerce models address the creation of partnerships with other parties along the supply chain, upstream as well as downstream, to share information of mutual benefit about the need of final customers. The key issue is that all upstream and downstream business activities should be coordinated to meet effectively the demand of final customers. Each partner in the stream should coordinate its own production/business plans (order fulfillment, procurement, production, and distribution) with those of the other partners so that sufficient streams of goods/services will reach customers in the right place at the right time.

B2B business models also address issues of customer relationship management (Kalakota & Robinson, 2001), the front-end function of a supply chain. An effective business model helps in creating more loyal customers who are not inclined to shop for lower prices but rather who pay for quality and service, in retaining valued customers, and in developing new customers by providing them with new quality products and services. The customer base could be segmented on history of performance in sales/purchases. This information will serve as a basis for promotion and discount, promoting the loyalty of current customers.

Limitations of B2B e-Commerce and Possible Solutions

Some limitations of B2B e-commerce have been identified, such as conflicts with the existing distributing channel, cost/benefit justification for the venture, integration with business partners, and trust among business partners (Laudon & Traver, 2007; Turban et al., 2008)

Most suppliers have existing distributing networks of wholesalers, distributors, and dealers. If a company decides to do business over the Internet directly with interested partners, it may cause conflict in terms of territory agreement and pricing policies on product lines. A possible solution could be redirecting these potential customers to the appropriate distributors and having the company handle only new customers outside the current sales territories of these distributors. Another alternative could be the company handling specific products/services not available within the traditional distribution channel. Or orders could be taken at the central site, with a distributor providing downstream added-value services (delivery, maintenance, support) to the new customers of the company.

Another limitation is the number of potential business partners, and sales volume must be large enough to justify the implementation of a Web-based B2B system. Selling-side marketplaces for B2B e-commerce is promising if the supplier has a sufficient number of loyal business customers, if the product is well known, and if the price is not the critical purchasing criteria. For the buying side, the volume of transactions should be large enough to cover the investments and costs in the B2B e-commerce venture. In many cases, the interested business could participate in an exchange by paying a fixed fee or a commission on the volume of transactions. Using an intermediary could be feasible, as the company would not need to invest and maintain the expensive and sophisticated infrastructure of B2B e-commerce systems.

On a technical perspective, unless a B2B e-commerce site has implemented a comprehensive network/system architecture, integration with a variety of business partners systems (Oracle, SAP, or other ERP systems) may cause an operational problem. These business partners should be able to

transact on compatible network platforms and protocols of communication. Sometimes the conversion implies additional investments and requires an extra cost/benefit analysis for the project. Also the technology should handle global transactions, such as multiple currencies and multiple languages from multiple countries, multiple terms of contract, and multiple product quality standards. Most current service providers in B2B e-commerce offer solutions to address these issues.

Because transactions over Internet are not face-to-face, most business partners are unknown to each other. Consequently, the issue of trust in B2B is the same as in B2C e-commerce transactions. Many B2B exchanges have failed because they did not assure the creditability of the involved business partners. Trust in e-commerce could be enhanced with some quality assurance services and warranty seal programs, such as *WebTrust* and *SysTrust* of the American Institute of Certified Public Accountants (AICPA) (*cpawebtrust.org*). In these programs, a third party (such as a CPA) audits the e-commerce transactions and infrastructure of a company to assure that it implements and follows some procedures and policies to guarantee privacy, security, processing integrity, availability, and confidentiality of online transactions and its obligation toward its business partners. Once the company meets some prescribed criteria, it is awarded with a warranty seal to post on its Web-site to inform the potential business partners on the security and quality of its online transactions. Some service providers in B2B e-commerce, such as *ariba.com*, have been awarded with the seals.

CRITICAL SUCCESS FACTORS FOR B2B E-COMMERCE

From the performances of current B2B e-commerce entities, one can highlight some critical success factors having an impact on sustainable business and competitive advantages (Laudon & Traver, 2007; Turban et al., 2008).

A company has pressure to cut costs and expenses in the traditional paper-based procurement process related to vendor and product searches, vendor performance and cost comparison, opportunity costs, and errors of manual system. B2B e-commerce would provide ample opportunities and alternatives to optimize the procurement process. In this circumstance, the company has an incentive be involved in an effective and efficient cost-saving venture using Web-based technology. In addition, the top management will be interested in sponsoring and advocating the project.

Another success factor would be for a company to have experience with EDI or other non-Web-based business-to-business electronic transactions and be willing to integrate its current systems with new technologies in B2B.

This would create a favorable climate supporting technology innovation. This factor is important in evaluating the technical feasibility of the B2B e-commerce project. It helps assess the readiness of the company, in terms of its technological maturity, to nurture an innovative system, and the availability of technical expertise needed to develop, operate, and maintain the system.

The industry concentrates on selling and buying with fragmented supplier and seller, and experiences difficulties in bringing both parties together. The larger source of buyers and sellers offered by B2B e-commerce would provide a company with opportunities to optimize its supply chain management. In this context, the potential economic and operational benefits would justify involvement in a B2B e-commerce venture.

Large initial liquidity is needed in terms of the number of buyers and sellers in the market and the volume and value of transaction to attract early business venture. In any economic feasibility analysis of a new venture, one needs to assess the cost of development and the payback period of the system. A large initial liquidity would justify the initial investment in a sustainable business.

A full range of services, such as credit verification, insurance, payment, and delivery, is needed to attract small and medium businesses. The market maker also needs available domain expertise for these services. The added-value services would facilitate the transactions of smaller businesses. These business partners, without a sophisticated infrastructure and expertise, will need a one-point access to the e-marketplace to conduct a one-stop transaction in B2B e-commerce.

Business ethics should be respected to nurture trust among business partners, fairness to all business parties, especially in non-face-to-face transactions over the Internet. Security issues should be implemented to protect privacy and trade secrets of involved business entities in an open networked marketplace. To address the issue of trust, the company may include some quality assurance services and seal programs, such as WebTrust and SysTrust of AICPA (*cpawebtrust.org*).

Another factor is being able to successfully manage the channel conflict, to avoid any impact on the short-term revenue of supply chain partners. This conflict of interest is one of the limitations of B2B e-commerce and possible solutions to it were discussed in the previous section.

B2B E-COMMERCE ENABLE TECHNOLOGIES AND SERVICES

The hands-off nature of such Internet technologies as the communication protocols TCP/IP and HTTP and the programming languages HTML, XML and XBRL enables the progress of e-commerce. These technologies assure interoperability across businesses using various platforms, which is necessary for global communications and transactions. XML, as a widely distributed standard, is compact and easy to program and permits businesses to more completely describe documents and transactions over the Internet. Its extension in XBRL helps in capturing and formatting financial information of a business and distributes it to partners in a reliable and timely manner.

Involvement in B2B e-commerce does not necessarily require intensive investment in hardware, software, or staffing for a sophisticated telecommunications network and database. There are many application and service providers that offer cost-efficient solutions for business interested in participation in this innovative marketplace. These services may support the complete value chain processes/activities of a business from its upstream suppliers to its final customers. Some major service providers in B2B e-commerce are reviewed in the following. They provide infrastructure, software and system integration to enable the automation of B2B functions such as contract management, spend management, sourcing management and negotiation, and e-procurement management on secured and privacy Web-based networks

Global eXchange Services (GXS) (*gxs.com*) provides global extranet service to B2B business with features such as online information publishing, dynamic delivery of supply chain data, and management workflow applications, enabling partners to share detailed operational information and to jointly manage key business processes. Its Trading Grid is a global integration services platform for enterprise business processes. It enables the real-time flow of information between businesses

regardless of technical capability, standards preferences, spoken language or geographic location. It offers an extensive range of solutions for businesses to connect with their worldwide partners, synchronize information, speed up the execution of their global supply chains. It rapidly enables trading partners over the web, enhances global trading partner on-boarding service. The Trading Grid provides an online, centralized, Web-based portal and a powerful data aggregation store. Customers can easily integrate with Trading Grid to automate industry-specific business processes without any additional software purchases required for their internal systems. In 2007, this provider has enabled more than 40,000 businesses, including 75 percent of the Fortune 500, to conduct business together in real time with over four billion transactions processed (gxs.com, 2008).

Ariba (ariba.com) provides Supplier Network with solutions for the rapid deployment and configuration of online procurement portals. These solutions automate end-to-end commerce processes, including catalog posting and search, requisitioning, purchasing, and invoicing. Integration with Ariba Supplier Network provides the infrastructure and third-party services companies need to transact, manage, and route orders in real time. It immediately connects companies to e-procurement on-ramps, supplier-hosted catalogs, and other marketplaces. With Catalog Interchange Format, suppliers can upload and standardize their catalogues for many different customers. With eInvoicing, account receivable department can generate invoices directly from the general ledger to Ariba Supplier Network for import by customers into their payable systems. Account receivable can also review current invoice status based on live data from customer ERP systems at any time. Buyers can use Ariba network to access global public directories of enabled suppliers while benefiting from negotiated visibility, security and privacy in transactions. In 2006, more than 135,000 registered suppliers in 115 countries transact $90 billion in spend annually on Ariba Supplier Network. Its customer base represents 30 percent of Fortune 500 and 45% of Fortune 100 companies who source over $120 billion through Ariba Supplier Network each year (ariba.com, 2007).

Perfect Commerce (*perfect.com*) provides a hosted service, called Open Supplier Network, connecting buyers and suppliers to facilitate B2B transactions. It also offers other B2B solutions. PerfectPIM organizes and published product and contract information from multiple suppliers, and helps users find, compare, and select products and services across all of a company's suppliers. PerfectProcure supports processes and controls in procurement such as automate review, approval, coding and creation of requisitions, purchase orders and invoices. PerfectSource provides tools to distribute RFPs and RFQs, to unify all contract and contract management activities into one comprehensive system, and to keep track of supplier performance. In 2007, Perfect Commerce serves more than 500 clients, 200,000 users and 12,000 suppliers worldwide with over 21 million product contents (perfect.com, 2007).

Quadrem (*quadrem.com*) provides a network to integrate many customers' ERP as well as legacy systems with the e-marketplace. It maintains a standardized electronic supplier catalogues having 10.5 million product contents in multiple languages. Suppliers can differentiate products and services beyond mere price. Quadrem offers services/ solution for B2B e-commerce such as RFQ distribution and response, order and order tracking, invoice and remittance advice. The content data from senders could be distributed in the formats used by the receivers' back-end systems to reduce errors and cycle times throughout the supply chain. In 2007, Quadrem connects more than 55,000 suppliers and 1,100 suppliers from a variety of industries. The network handles more than $13 billion in order throughput annually (quadrem.com, 2007).

THE ROAD AHEAD

B2B e-commerce framework could expand to cover activities beyond than just selling and buying. B2B e-commerce partners in an extended value chain could involve in *collaborative commerce* (c-commerce) and *product life cycle maintenance* in a Web-based system to meet final consumer demand by sharing information on product design, production planning, and marketing forecasting/coordination (Laudon, & Traver, 2007; Turban et al, 2008). Once consumer demand is identified, the quantity on hand of the raw material and semifinished and finished products of one partner will be made visible to others, avoiding bottlenecks along the value chain and supply chain. In this type of business, some partners act as value chain integrators while others are value chain service providers. This business model assures the production of goods/services that effectively meet consumer demand with the collaboration between manufacturers and retailers. Then the product design and production cycle will be efficiently shortened with the collaboration between manufacturers and upstream suppliers. It also helps in *just-in-time (JIT) sourcing* to lower transportation and inventory costs, and to reduce stock-outs.

GLOSSARY

Aggregation of Orders and/or RFQs. A compilation of small orders and RFQs of many businesses into a larger package to gain volume discount and economic of scale.

Bartering. A trading method in which business partners exchange their surplus to one another without using cash.

Digital Loyalty Network. A business model to offer special treatment to valued/preferred business parties in the value chain or supply chain in terms of priority, pricing and contract conditions.

Exchange/Trading Mall. A business model represents a many-to-many business relationship in B2B e-commerce. In this marketplace, many buyers transact with many suppliers for goods and services.

Meta-Catalog. A compilation and index of goods and services offered by many small businesses into one source for easy of access to the public or interested parties.

MRO. Non-production or indirect materials in maintenance, repairs, and operations.

Request for Proposal (RFP). A tendering system in which a seller lists the materials for disposal and asks potential buyers bid on the contract. Buyer offers highest bid (forward auction) will win the contract.

Request for Quote (RFQ). A tendering system in which the buyer lists the materials in need and asks the potential suppliers bid on the contract. Supplier offers lowest bid (reverse auction) will win the contract.

Spot Buying. An instant purchase/rush order concludes at a market price resulting from the matching of current supply and demand. Also called **maverick purchase**.

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