EVALUATING THE OPTIONS FOR BUSINESS-TO-BUSINESS E-EXCHANGES

E-commerce demands that IT managers pay just as close attention to business issues as to technical ones. What are the company’s goals for the B2B E-commerce marketplace? What are the volume and size of the buyer–supplier transactions? How unique and complex are the buyer–supplier interaction processes in the firm? These are some of the key business questions IT managers must be able to answer. This article addresses these questions, as well as others, and takes an equally close look at the issues surrounding infrastructure and technology.

It would not be an exaggeration to state that the Internet represents the most significant change in the corporate world since the invention of the telephone. Over the past few years, the Internet has been a market maker, a market destroyer, an industry change-agent, and even an inverter of traditional ways of conducting business. The Internet and Web technologies have presented established firms with both opportunities as well as threats. The use of Web technologies in inter-organizational business transactions and in inter-firm relationships has caught the attention of executives and industry experts. This phenomenon is popularly known as business-to-business (B2B) E-commerce.

The business press has disseminated varying statistics on the potential growth of B2B E-commerce. According to the U.S. Census Bureau, B2B transactions in the manufacturing sector alone were worth over $777 billion in year 2000. In 2001, the year 2004 projections by different industry sources had a range from $963 billion to between $3 and 6 trillion (ActiverMedia Research, IDC, Goldman Sachs & Co., Forrester). While the estimates predate the B2B shakedown, the general consensus is that B2B E-commerce has a significant growth potential in the near future.

Several buzzwords such as E-hubs, Internet exchanges, E-markets, E-procurement, and E-exchanges have been coined by industry to refer to different models of B2B E-commerce. Pundits and experts have been writing numerous articles and books on what potential benefits can be derived from B2B E-commerce. Buzzwords and predictions aside, the simple questions that are weighing on the minds of senior executives are the following:

- How can an organization successfully exploit Internet technologies for improving inter-organizational relationships and business transactions?
- What are the alternatives and reasons for pursuing the different choices?
- What challenges need to be considered while exercising these options?

These are the issues addressed in this article.

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EVALUATING E-BUSINESS OPPORTUNITIES
INTERNET AND B2B RELATIONSHIPS

To understand the B2B landscape, one needs to focus on two fundamental ways through which business relationships could be fostered using the Internet: many-to-many and one-to-many relationships (Exhibit 1). The Web provides a forum for many firms to come together in a common electronic platform to transact business, thus enabling many-to-many relationships. Further, the Web can enable a single firm to have one-to-many linkages with customers, suppliers, or both.

Many-to-many relationships are facilitated by B2B E-marketplaces that bring together sizeable numbers of buyers and suppliers. B2B E-marketplaces (E-markets or E-exchanges) are electronic hubs where companies can trade goods and services and exchange information. B2B began as one-to-one electronic data interchange (EDI) linkages and has since migrated to a variety of many-to-many models that enable myriad new capabilities. Another approach for B2B commerce is in the form of private exchanges that enable one-to-many relationships.

E-MARKETPLACES

As the Internet became a common business medium in the mid-1990s, several firms started developing Web-based E-marketplaces. An E-marketplace is a Web site where goods and services can be bought from a wide range of suppliers. Most of these E-marketplaces initially started as vertical portals (vortals), focusing on services to a specific industry. The main idea behind the vortals was to bring together suppliers and buyers of a specific industry on a common electronic platform and to provide a variety of information as well as business transaction services to these firms. The important information services they provide include industry news, reports, trends, analyses, and in-depth reports of the companies in the industry. In addition to the information services, these E-marketplaces also enable companies to contact each other, exchange goods and services, and transact business.

Another type of E-marketplace, called the horizontal marketplace, revolves around specific products or a group of products. These exchanges form around a supply market that cuts across multiple industries. The marketplaces for buying and selling MRO goods (materials, repair, and operations) such as hand tools, safety supplies, etc., that are used in production but are not a part of the final product (indirect materials), are examples of horizontal E-marketplaces. The market for such product groups is fragmented, so horizontal marketplaces provide a value-adding forum for buyers and sellers to match respective needs and conduct business.

Yet another type of E-marketplace is the function-oriented E-markets that concentrate on a particular business function and its business processes. For example, employeese.com helps HR departments manage employee administration and benefits. Similarly, Tradeout.com brings together firms that want to sell their excess inventory to buyers. Such marketplaces help in locating suppliers and buyers of specific functions, and also considerably reduce the overhead costs and efforts involved in performing these functions.

As E-marketplaces evolved, several variations of the many-to-many and one-to-many models emerged. A more robust classification of the E-markets is based on the ownership of the exchanges and the governance structure underlying them. Based on these, E-marketplaces could also be classified into three categories: independent, consortia, and private exchanges. The characteristics and the operational dynamics of these three types are significantly different as to warrant special attention. The following sections discuss and analyze each of these categories.
Independent Exchanges
Most of the E-marketplaces that were formed in the heyday of E-commerce were pure Internet start-ups developed by independent players. These firms hoped to cash in on the high dot.com valuations in the late 1990s. Examples of independent E-marketplaces include Chemdex, e-steel, etc. While a few independent E-marketplaces such as AutoTradeCenter.com went public, a vast majority of these independent firms remained private, dependent largely on venture capital funding to build their businesses. With increased competition, decreased venture capital funding and hostile stock markets, most of the privately held, independent E-marketplaces were under intense financial pressures by 2001.

Apart from financial troubles, there are other reasons why many independent exchanges failed. From a fundamental economics perspective, most of these exchanges operated in a domain with low entry barriers. As a result, many firms entered the fray and the competition intensified. For example, in the chemical industry there were more than 25 E-marketplaces operating by year 2000, including Chemdex, ChemicalDesk, ChemB2B.com, and e-Chemicals. Also, the management teams of these firms often had technology executives who lacked business skills and industry-specific knowledge. The lack of adequate financial resources and business expertise led to the downfall of several independent exchanges. Some of the independent exchanges that had built a sound technical infrastructure became service providers, repositioning themselves as software and service companies, assisting other firms in their B2B efforts.3

For an independent exchange to survive over the long term, it needs to have a form of hard-to-imitate and value-added services that give it an edge over the competition. An example of a value-added service provided by an exchange is BuildNet, which not only provides facilities for trading products, but also provides value-added services in the form of specialized solutions for materials planning, job-lot scheduling, etc. Independent exchanges that operate as functional or horizontal niches might find it easier to compete.

Consortia-Based Exchanges
Consortia-based exchanges are joint ventures involving different firms, with an overall goal of improving their performance and that of the industry as a whole. In this model, the various industry players, including competitors, combine forces to create a common forum for doing business-to-business transactions. One of the earliest of these was Covisint, created by DaimlerChrysler, Ford, and General Motors. Another popular consortium marketplace is Transora, formed by consumer-products companies such as Unilever, Proctor & Gamble, and Coca Cola, as well as the grocery manufacturers. Avendra is an E-marketplace established by Marriott, Hyatt, and three other major hotel chains. Exostar is an exchange in the aerospace sector formed by companies such as Boeing, Raytheon, Lockheed Martin, and BAE Systems.

The fundamental idea of the consortia exchanges is to exploit the size, deep industry knowledge, and sophisticated business practices that the founders bring to the exchange. As opposed to independent marketplaces, the consortia exchanges also have an inherent advantage in the form of high liquidity from their own founders.

A major hurdle facing consortia exchanges is antitrust and other regulatory issues. By their very business model, a consortium exchange brings competitors together, and thus has the potential to diminish competition. Several consortia exchanges often require agreements that ask for sharing of product, price, quantity, and other supply-chain data. This has raised concerns about unfair and anticompetitive trade practices. Depending on the vested interests of the key founders, the consortia exchanges might treat other industry players unfairly or even engage in activities such as price-fixing, exclusion from participation in exchange, etc. Regulatory bodies in the United States and Europe are scrutinizing such complaints.

Several consortia exchanges have not lived up to their initial expectations for other related reasons. The sheer founding members’ size and long-term business practices, let alone ownership interests, have resulted in some cumbersome and slow decision-making processes under joint governance structures. This is, of course, in conflict with the speed and business agility that have been associated with E-commerce developments emerging from Silicon Valley in the late 1990s.

Another problem relates to building a sustainable supplier base. Many consortia exchanges failed to come up with attractive value propositions for suppliers. Some exchanges require the suppliers to conduct all sales through the exchange, and also require them to pay transaction fees. Although this provides cost and process advantages to the buyers, suppliers are
forced to bite narrow margins. In some cases, suppliers have created their own upstream consortia exchanges in response.

For a consortia exchange to survive and succeed, it needs to have strong commitment and collaboration among its members. To promote stronger commitment and collaboration, several exchanges have issued equity warrants to members when their transaction volumes meet set targets. Other tactics include confidence-building measures such as joint procurements, sharing of emergency inventories, joint coordination of logistics, etc. To overcome supplier resistance and develop a broader supplier base, several consortia exchanges have included some primary suppliers as founding members. In these cases, suppliers, distributors, and other business partners come together to found an exchange, thus paving the way for closer collaboration. In other cases, suppliers play roles as ‘development partners,’ in which they have an active role in determining the functionalities of an exchange and also the product offerings. For example, Covisint included some of its key suppliers as development partners in the exchange.4

Private Exchanges

Private exchanges are single-firm operated, Web-based hubs that connect a firm to its business customers, suppliers, or both. Unlike independent exchanges that are managed by third parties, and consortia exchanges that are owned by a group of firms, private exchanges place complete control of the B2B exchange in the hands of the company running it. An important feature of the private exchange is that it is an invitation-only network. The company establishing a private exchange can choose the partners it wants to participate in the exchange. Therefore, these exchanges are not marketplaces in the real sense. They do not help locate new customers or suppliers; however, they provide a cost-effective way to improve and enhance the linkages and processes established with suppliers and customers.

The ancestor to private exchanges is EDI — the application that many companies have traditionally used to exchange and share documents and other information via a telecommunications network. Private exchanges offer all the advantages of traditional EDI, with increased capabilities based on the Internet and Web technologies. Companies such as Motorola, Dell, Cisco, and Wal-Mart have established private exchanges to establish closer relationships with their business partners and achieve considerable process efficiencies and cost savings.

Private exchanges can be further classified into buyer based or seller based. Buyer-based private exchanges connect a buyer firm to its suppliers, thereby providing effective and efficient supply-chain operations. They typically facilitate common tasks such as online ordering, invoicing, and shipment delivery confirmation. However, they could also be used for forging stronger collaborations with suppliers in the form of collaborative planning and replenishment, forecasting, joint product design, etc. Through its private exchange, Wal-Mart allows its suppliers access to the history of customer transaction data, and suppliers use this data to analyze the sales trends, plan their production, and manage their inventories accordingly. Participation in such buyer-launched exchanges also enables suppliers to quickly respond to customer demands, manage their processes more efficiently, and gain privileged access to the buyers’ systems.

In seller-based exchanges, a firm establishes B2B linkages with its key customers using a Web site. These exchanges provide facilities for managing customer orders, product specifications, customer support, and such activities. For example, Cisco’s private exchange allows customers to configure, place, and check their orders on the exchange. In some private-seller exchanges, the seller can even examine a customer’s inventory and replenish it automatically. These exchanges could also be designed to facilitate joint product design, forecasting, and collaborative planning.

In 2001, Motorola implemented a B2B private exchange through which its dealers and customers could log on and obtain product-related information and also fully manage their accounts. Traditionally, the company relied on a network of dealers to manage both the sales and service of their product lines. However, the company also had other channels and a direct sales force through which certain groups of customers were serviced. To manage multiple types of customers, configurable products, and a vast array of product lines, the company relied on a system of call centers and bulky print catalogs and product literature. This was complex and cumbersome. With the implementation of a private B2B exchange, Motorola now provides a common platform for its large corporate customers and dealers to transact business with the firm. Apart from obtaining product information and service support, as
well as managing the orders, customers also have the authority to control who can place orders, who can get access to their internal account information, etc. This has provided a lot of flexibility to the customers, cut down the order processing times, reduced the delivery times, and improved customer satisfaction.

A major advantage of a private exchange lies in its ability to support a firm’s unique strategy and organizational needs. Unlike the independent and the consortia models, where a company would have less freedom to align its B2B activities with specific organizational requirements, a private exchange offers the flexibility of tailoring an exchange to meet firm-specific requirements and strategic goals.

Private exchanges are more appropriate for companies that enjoy a dominant position in their industries and possess superior supply-chain management capabilities. Such companies may not opt for a third-party-managed independent or consortia exchange in order not to share their knowledge and expertise. For example, Dell enjoys a formidable position in the computer industry due to its build-to-order supply-chain capabilities, and has opted to have its own private exchange; it prefers to keep its proprietary supply-chain practices secret.

**ASSESSING THE OPTIONS FOR B2B E-COMMERCE**

A company examining B2B E-commerce has a number of options. As previously discussed, it can launch its own exchange or join an E-marketplace established by independent entities, or perhaps join an industry consortium as a founder or as a participant. A mapping of the different approaches and B2B exchange options available to a firm is shown in Exhibit 2.

The overall objective of engaging in B2B E-commerce is to improve profitability via better inter-firm relationships, supply-chain planning and collaboration, product pricing, logistics and distribution management, and procurement efficiencies. For a company to realize its goals from B2B E-commerce, a single model or a single B2B application may not be sufficient. Instead, the company needs to have a portfolio of E-business applications that are aligned with its overall business strategy.

For example, one of the earliest B2B E-commerce initiatives by Dow Chemical was to set up a private exchange: MyAccount@Dow. This exchange was launched in Latin America in 1999 after pilot testing with over 200 customers. In 2002, it grew to over 8000 users in 35 countries, capturing 40 percent of the total sales volume in Latin American countries. In addition to this private exchange, Dow Chemical also involved itself in close to ten other B2B initiatives. Dow Chemical has also participated in consortia exchanges, including Omnexus to sell plastics and Elemica to sell other chemical products; and has equity stakes in ChemConnect, an independent exchange for locating new suppliers and for auctioning some direct materials. Thus, the company has a portfolio of B2B projects, each aimed at bringing distinct capabilities and advantages to the organization.

When considering appropriate options for B2B initiatives, an executive is often faced with decisions about whether or not to join an exchange, to launch the company’s own exchange, or to just stay on the sidelines to wait and watch. The key decision may not be about participating in exchanges *per se*, but rather about which products or business units should...
participate in which markets and at what level. The nature of the company’s products, the raw materials that go into producing the products, and the complexities in the firm’s supply chain should primarily drive the B2B decisions.

Given the success of Dell, Cisco, and Wal-Mart’s private exchanges, launching a private exchange might sound like a superior solution, but it also has its own problems. The costs of setting up a private exchange can be much higher than the costs involved in forming an industry consortium or participating in other independent exchanges. Apart from the up-front capital costs of setting up an exchange, the annual operating costs are also likely quite high. And a private exchange is bound to fail if the firm does not exert significant influence in its supply chain to bring its suppliers or business partners to the exchange. Therefore, the power that the firm wields in its supply chain and the level of investment required should be important considerations. If a firm has a longer product cycle, and if the number of suppliers or customers is rather small, it may not be beneficial to launch a private exchange. Other investment alternatives could deliver similar or better results.

There are other important issues that need to be considered by firms assessing their B2B options. The extent of maturity in the industry is one such issue. For example, one of the key concerns in B2B e-markets relates to the standardization of codes used for product-related data. Less-mature industries may not have standards for products and for facilitating information exchange. In fact, the standards for products and product-related data in many developed, mature industries may also be fragmented. Because B2B systems require that multiple firms follow standard codes for describing products, it is important to integrate disparate data formats and codes. Only such an exercise will pave the way for the seamless integration of Web-based systems across supplier and buyer organizations.
An important technical concern in B2B E-commerce is the interoperability across the participants’ internal systems, new B2B systems, and the applications used by the other business partners. It is important to integrate the B2B systems with the current IT architectures of multiple organizations involved in the B2B initiative. This is a monumental systems integration exercise, as it involves developing integrated solutions for proprietary mainframe-based applications, multiple platforms, and databases across multiple companies.

A summary of some of the most important considerations in assessing B2B electronic commerce options is presented in Exhibit 3. This can serve as a preliminary checklist for firms to assess their own positions and their supply-chain environment, and to determine appropriate courses of action.

CONCLUSION
B2B E-commerce offers cost-effective ways to manage inter-firm relationships and conduct business transactions. In an era of extended enterprises where the business success of a firm largely depends on its suppliers, customers, and other business partners, it is important to recognize the potential of B2B E-commerce and take appropriate action. Remaining on the sidelines, adopting a wait-and-watch approach, could prove to be a costly mistake. Based on the internal organizational context, the industry conditions, and the complexities involved in their supply chains, firms need to be making strategic investments in B2B E-commerce solutions.

Notes