

B2B e-Commerce Opportunities

By Sunil Chopra, Darren Dougan, and Gareth Taylor

Now that the hype has died down, it's instructive to step back and ask what the Internet can do for you from a practical standpoint. This powerful technology can, in fact, create great value—but in different ways for different companies and different competitive environments. Determining which B2B e-commerce opportunities fit your particular situation is an essential building block for future success.

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Over the last year, valuations of many Internet business-to-business (B2B) e-commerce companies have declined significantly. Is this drop an indication that B2B e-commerce can provide little value in a supply chain? Should companies decrease their e-commerce efforts? As they consider these questions, senior executives face a serious dilemma. On the one hand, dropping all e-commerce efforts can leave them at a serious disadvantage if their competitors are able to exploit the benefits of the Internet. On the other hand, unwise or over-investing can be costly if the perceived value is not realized.

The basic premise of this article is that the Internet's unique characteristics will allow businesses to create significant value in the future. The value of B2B e-commerce, however, will vary depending upon the supply chain strategy and competitive environment that a company faces. Successful companies will be those that can tailor their e-commerce initiatives to support those areas where maximum value can be extracted. Our goal is to provide a framework that supply chain executives can use to identify where the value lies, the magnitude of the value, and how value can best be extracted after considering the effort involved.

Where Is the Value?

Now that the hype is over, it is worth taking a step back to ask what the Internet does from a practical standpoint. The Internet is a unique communication medium that allows rapid, two-way, secure communication. What makes the Internet different from electronic data interchange (EDI), a technology that has been in existence for more than 20 years? Essentially, the Internet performs the same function as EDI at a fraction of the cost. Moreover, it has capabilities that EDI does not possess—real-time (vs. batch) processing, transmission of unlimited data types (such as graphics, forecasts, and computer-aided design (CAD) drawings), and an open, non-proprietary network. If carefully exploited, these characteristics of the Internet can facilitate significant value creation through B2B e-commerce.

In identifying potential sources of value from B2B e-commerce, it is useful to think of the many ways in which a company interacts with its customers and suppliers. These interactions can be categorized as one of the following: executing a transaction, determining optimal prices, discovering available supply and unmet demand, and supply chain planning for new and existing products. Thus, three distinct categories emerge where B2B e-commerce can be applied to extract value. These are:

- Reduced transaction charges.
- Improved market efficiencies.
- Enhanced supply chain benefits.

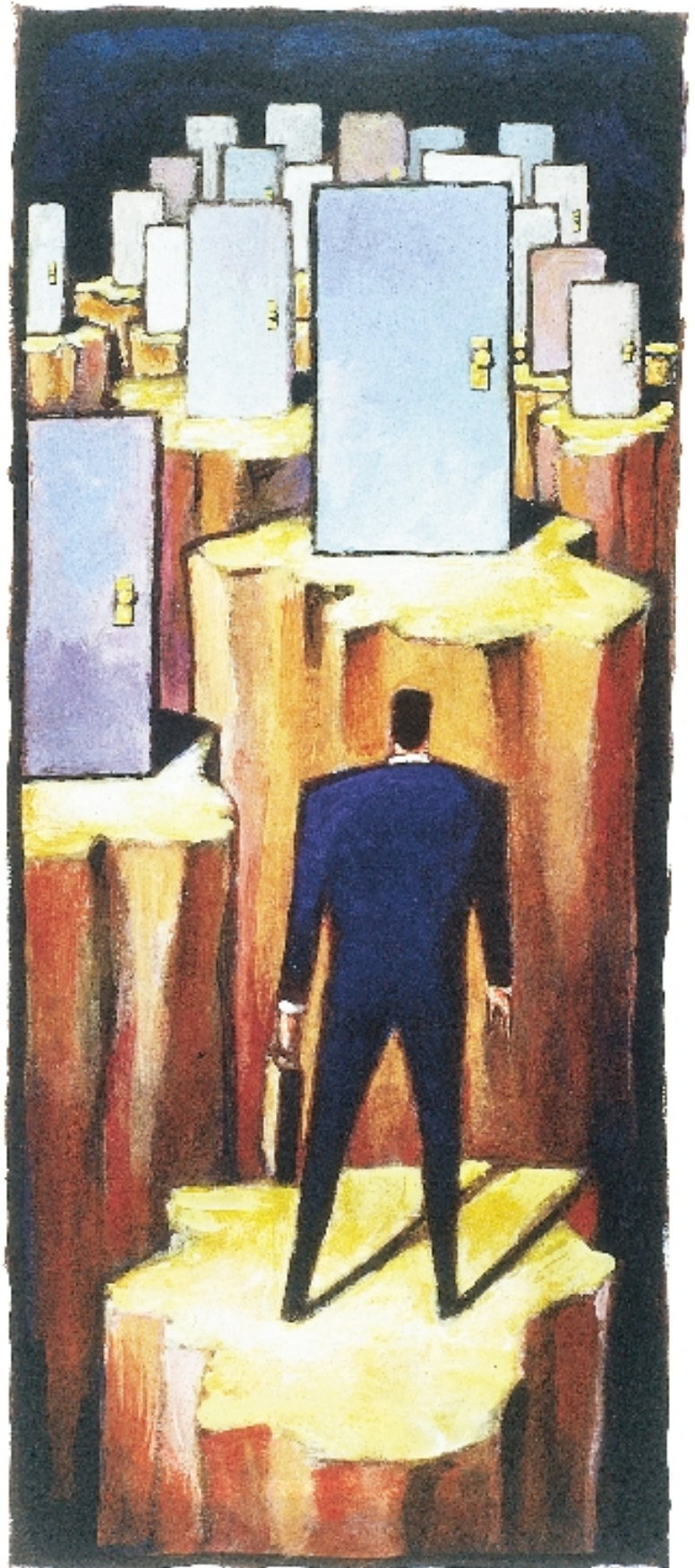
Before making any investment in B2B e-commerce, a company must identify the value created and the effort required for implementation under each of the three categories. (Exhibit 1 on the following page depicts that value proposition.) The relative position of the three categories will not be the same for all firms but will vary based on the supply chain strategy and competitive environment.

A company must tailor its e-commerce implementation to support categories where the value created is high relative to the cost of implementation.

Transaction charges are costs incurred during the process of completing a transaction. This includes the costs associated with handling proposals and quotations, processing orders, staffing the procurement function, operating the call centers, and so on.

Traditional channels of communication such as phone and fax require high staffing levels on both the buyer's and the seller's side. They also typically have high error rates because of the multiple data entry involved. As companies transition to electronic processes, error rates decline, fewer staff are needed to process orders, and order placement speeds up—all of which serves to lower the overall transaction cost.

Companies using EDI already have achieved many of the benefits in this category. Given the high setup cost and proprietary nature of EDI, however, they have only set up links



with their largest suppliers. The Internet with its open access and lower cost of participation affords all players the opportunity to reduce transaction charges. In addition, the Internet allows real-time processing and electronic data retrieval and storage—essential components to reducing order cycle time.

Market efficiencies offer two avenues for a company to extract value: (1) the price paid when soliciting bids from suppliers and (2) the ability to match surplus capacity in its supply chain with unmet demand. The Internet offers an opportunity in both instances. It facilitates the aggregation of orders across all divisions of a company and makes it easier to bring in more potential suppliers to the bidding process. This translates into a better price for the buyer because of increased volumes and greater competition. B2B e-commerce also provides a mechanism by which a company like Cisco can move its demand across suppliers based on available capacity. In the past, suppliers may have had idle capacity while original equipment manufacturers (OEMs) with unfilled demand were searching elsewhere. A better matching of available capacity and demand provides value by improving the utilization of available capacity.

Supply chain activities include the flow of information, materials, and finances between different stages of a supply chain from suppliers to customers, as shown in Exhibit 2. When different stages of a supply chain plan locally without sharing information, the result is the “bullwhip effect,” whereby small fluctuations in consumer demand lead to large fluctuations at the manufacturer and supplier. In some supply chains, orders to suppliers can fluctuate 10 to 20 times more than orders placed by customers. The increased variability leads to long supply lead times, excess capacity, high transportation and warehousing costs, large inventories, and dissatisfied customers.

B2B e-commerce can create value in a supply chain at two levels. First, by increasing visibility across the supply chain, the Internet can help dampen the bullwhip effect. The

resulting decrease in variability allows a supply chain to improve customer service while decreasing costs.

Second, the Internet can provide value from increased collaboration. Collaboration is the ability of different stages of a supply chain to use the common information obtained from visibility to make decisions on product design and introduction, pricing, production, and distribution that will allow all partners to profit. For example, Wal-Mart and Procter & Gamble (P&G) increase visibility when Wal-Mart shares point-of-sales data. The partners only realize full value, however, when they use this information, along with capacity information at P&G, to decide the best timing for promotions and resulting production plans. If decisions are made independently, Wal-Mart may run the promotion at a time when production costs for P&G are high. Through collaboration, constraints on both sides are considered in determining a schedule that maximizes profits.

The Internet also facilitates collaborative product design. This is a key capability planned for Covisint, the automotive exchange operated by Ford, General Motors, and Daimler Chrysler. Currently, CAD drawings of product components are designed by engineers in one country, distributed by FedEx to engineers in another country, and then finalized at a joint meeting in a country somewhere in between! B2B e-commerce promises a “virtual project workplace” where engineers can collaborate with suppliers and customers *real-time* from their desks, saving cost while speeding up product development cycles and time to market.

What is the Magnitude of the Value?

To identify the magnitude of the value from B2B e-commerce, companies need to consider the strengths and weaknesses of their current supply chain interactions. The greater the inefficiencies in each of the three categories, the greater the Internet’s potential to correct them.

Transaction Charges

Large reductions in transaction charges are likely in industries that display the following characteristics:

- Transactions tend to be frequent and small in size.
- Phone and fax are the current mode of transmitting orders.
- Considerable effort is spent reconciling product and financial flows.

A perfect example is the maintenance, repair, and operations (MRO) industry. Typical customer orders here tend to be small and considerable effort is spent placing and receiving the order and reconciling payments. When the goal is to reduce transaction charges, the e-commerce effort should focus on giving customers the ability to:

- Search for products.
- Identify product availability and pricing.
- Identify substitutes.
- Perform credit checks and financing.
- Place and track the order until delivery.
- Process payment.

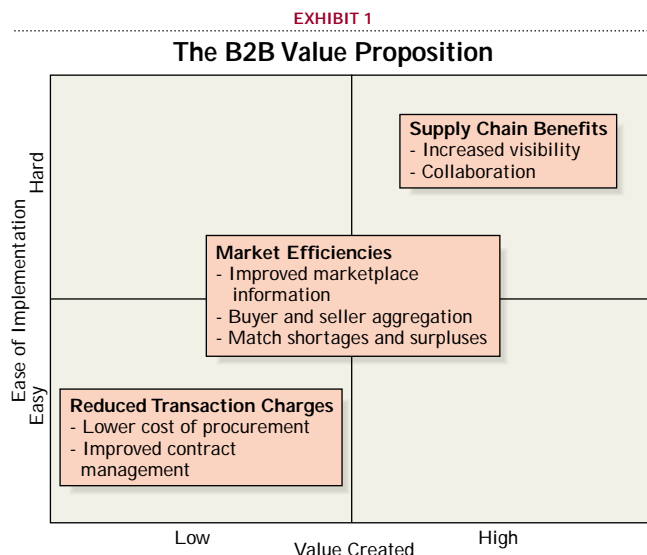
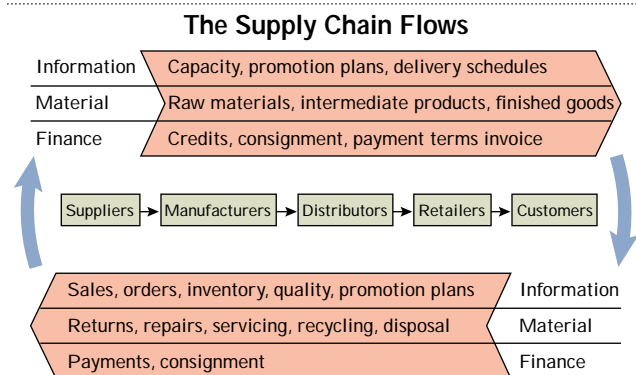


EXHIBIT 2



These capabilities will eliminate duplication of work, reduce error rates, and decrease the cycle time.

The magnitude of the savings from e-commerce will vary depending on each company's specific situation. i2 Technologies, for example, estimates that companies can achieve transaction savings of close to 2 percent of sales by using the Internet. Eastman Chemical estimates transactional savings of close to 4 percent of sales, while British Telecom claims to have reduced transaction costs associated with procurement by 90 percent using e-commerce.

Companies with an EDI system in place are unlikely to achieve such major reductions in transaction charges. The Internet does provide a less expensive infrastructure than EDI and has a lower ongoing maintenance cost. Yet for companies that already have EDI, the infrastructure costs are sunk and new investment is required for transfer to the Internet.

Consider this example from the consumer packaged goods industry in Australia. Two large retailers, Coles Myer and Woolworth's, dominate the market. They already have EDI links with all major manufacturers. Moving to an Internet-based system would reduce transaction charges by a relatively small amount. Another example is the U.S. auto industry where companies are already linked via EDI to their major suppliers. Simply switching to an Internet platform is unlikely to lower transaction costs significantly, though it would benefit smaller suppliers not currently on EDI.

The investment may be justified if it allows companies to connect with suppliers that are not linked via EDI or if it enhances the current system's overall effectiveness

Improved Market Efficiencies

B2B e-commerce can provide significant value through improved market efficiencies by reducing prices in industries where:

- Limited buyer/seller qualification is required.
- A fragmented market exists with many competing players either on the buy or sell side.
- A large numbers of buyers/sellers can be attracted to the online site.

If significant buyer/seller qualification is required offline, the Internet's value in creating market efficiencies by decreasing prices is diminished. For example, in sec-

tors such as automotive and heavy manufacturing where long-term contracts predominate, all bidders have to be prequalified. Thus, an online auction simply serves as a dynamic tendering mechanism. Companies in these sectors have reported a 2- to 20-percent decrease in prices paid though the use of auctions. These reductions, however, are not the result of identifying a lower cost supplier. In most cases, the contract was awarded to the incumbent supplier who felt pressured into lowering its prices. These price reductions are unlikely to be repeated in the future because no fundamental reduction in cost has occurred; margin simply has been passed from one party to another.

Market efficiencies are much more likely to decrease prices if buyer/seller qualification is not important and the market is highly fragmented. Under such conditions, the Internet is more likely to help companies identify a truly lower cost supplier, thereby providing real supply chain value. Of course, this can only happen if many suppliers are willing and able to participate in the online bidding process. A good example is the MRO industry in the United States, where even large players like W.W. Grainger have a relatively small share of the market. Use of the Internet for MRO buying has resulted in downward price pressure, with savings of up to 30 percent reported on selected indirect materials.

Market efficiencies also can lower prices when many small buyers use the Internet as an infrastructure for aggregating orders. An example is FleetXchange.com, which aggregates buying for small truck fleets. These price reductions are likely to be sustainable because the supplier benefits from having a relatively steady aggregated demand compared to the highly variable demand from each small fleet.

In addition to reducing prices, B2B e-commerce can provide significant value by matching supply surplus and unmet demand in industries where capacity is expensive and mismatches of surplus supply and unmet demand are common. Cisco, for example, is using the Internet effectively to move demand to suppliers with available capacity. Of course, successful matching requires that a company clearly identify the capability of all available capacity. The Internet provides the ideal infrastructure for flexible capacity to be matched with companies facing a shortage.

The value from matching surplus supply and unmet demand is likely to be the greatest in industries that experience highly uncertain demand and where flexible supply can be diverted to satisfy unmet demand. For example, General Mills saved seven percent of its transportation costs by implementing a backhaul exchange with its business partners. Unused fleet capacity was matched with partner freight requirements. The result was higher asset utilization, reduced cost, and improved cycle times. The Internet also provides an ideal channel to dispose of surplus supply as demonstrated by the airline, rental car, and hotel industry.

Supply Chain Benefits

The value of supply chain benefits is likely to be highest in industries with the following characteristics:

- The supply chain overall has low inventory turns and poor product availability.
- The supply chain consists of many stages or tiers.
- Each stage has little visibility into either the customer or supplier stage.
- There is little collaboration on promotions and new product introduction.
- Product life cycles are short.

At the most basic level, the Internet enables increased visibility across a supply chain. The value of visibility increases with the number of stages in the supply chain that are participating. Full value is realized only when different stages of the supply chain plan their activities collaboratively based on a common forecast of customer demand. The benefits of visibility and collaboration are likely to be greatest in supply chains where the variability in the internal flow of material is greater than the variability in end-consumer demand, as is the case for many consumer goods with predictable demand. Supply chains that use the Internet to coordinate the design and introduction of short life-cycle products also will benefit greatly.

Achieving visibility is comparatively easy because it only requires the implementation of the right technology. Collaboration in planning and new product introduction is harder because it requires significant changes in organizational structure along with the technology. In fact, a case can be made that the organizational changes play a more important role than technology in collaboration. Potential benefits from collaboration, however, will far exceed those obtained from simple visibility. Companies implementing initiatives like efficient consumer response (ECR), vendor managed inventories (VMI), and collaborative planning, forecasting, and replenishment (CPFR) are putting into place organizational changes that, when coupled with B2B technology, will help them achieve the full benefits of collaboration.

Industry characteristics and the competitive situation play a large role in determining how much value a company can derive from each of the three categories. For MRO products, for example, the major benefits are likely to center on reduced transaction costs and increased market effi-

ciencies rather than on the supply chain benefits. With consumer packaged goods or automotive products, on the other hand, supply chain benefits are likely to be the largest source of value, followed by lower transaction costs and market efficiencies from improved matching of surplus capacity and unmet demand. Before deciding which source of e-commerce value to pursue, each company must identify its industry characteristics and the current competitive realities.

A Roadmap for B2B E-Commerce Implementation

In designing their B2B e-commerce strategy, companies need to answer three key questions:

1. Where is the potential value for the company?
2. What are the key success factors to extract value?
3. What are the current market options?

Where Is the Potential Value for the Company?

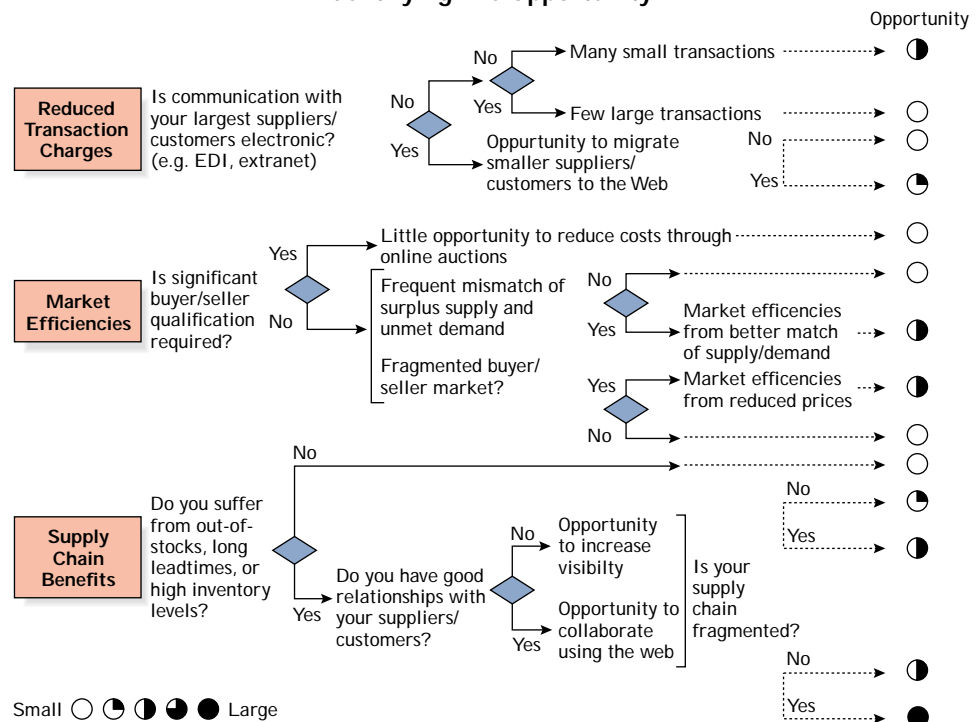
The goal of this step is to identify whether B2B e-commerce will provide value from reduced transaction charges, from market efficiencies through reduced prices or better match of supply and demand, or from supply chain benefits. In each instance, the company must identify the magnitude of the opportunity based on factors discussed earlier and presented graphically in Exhibit 3.

What Are the Key Success Factors to Extract Value?

In this step, the company must determine whether it possesses the key success factors required to extract the potential value identified. These success factors can be classified as supply chain strategy, IT requirements, and organizational

EXHIBIT 3

Identifying The Opportunity



requirements. The goal is to identify both the factors already in place and those that need to be implemented before value can be extracted.

Supply Chain Strategy

A supply chain strategy defines the nature of existing supply chain relationships and determines whether the company is focused on providing efficiency or responsiveness in the market.

A company focused on efficiency will benefit from reducing transaction charges. A company focused on responsiveness, however, may not necessarily benefit from reducing transaction charges if the result is diminished responsiveness. In fact, targeting reduced transaction charges may have a significant negative impact on the supply chain relationships. If these relationships are key to providing responsiveness, companies will probably not want to pursue transaction charge reductions through online auctions.

Companies must consider these questions before targeting lower supplier prices as a source of value:

- To what extent can enlarging the set of competing suppliers drive down prices?
- Is there a large and diverse enough supplier base that remains untapped?
- Are relationships with incumbent suppliers a source of competitive advantage?
- If market efficiencies come from aggregation, is the firm willing to share buying power with potential competitors?

Market efficiencies through improved matching of surplus supply and unmet demand can benefit all partners in the supply chain.

Regardless of whether they are pursuing an efficiency or a responsiveness strategy, all companies can extract supply chain benefits through the Internet. The key is to collaborate in a way that benefits all partners. Effective collaboration reduces total costs rather than redistributing them. The Internet facilitates collaborative activities and enhances the opportunities that collaboration provides.

IT Requirements

Information technology requirements define the technical capabilities that must be in place for a company to transfer its business processes to an Internet-based system in a sustainable manner. Companies need to ask the following questions when analyzing IT requirements:

- What are the business processes and systems that will be transformed or integrated online?
- What will it take to transform or integrate these systems?
- Can our current level of IT skills and infrastructure support the transformation?
- Can other members of the supply chain develop required IT skills and infrastructure for the initiative to succeed?

IT requirements for reducing transaction charges focus on simplifying the tasks of order placement, fulfillment, and tracking by integrating systems for pricing, product availability, and ordering across different channels (for example, cata-

logs, Web, and sales force). Suppliers, transportation providers, warehouses, and buyers also must have systems that centrally and dynamically provide pricing, quotation, ordering, availability, and tracking.

Price reductions through market efficiencies require information technology that provides an information infrastructure such that product specifications can be clearly conveyed to and from potential suppliers and supplier bids can be received and evaluated. Matching surplus supply with unmet demand requires information technology that provides visibility into available supply as well as into demand across the supply chain.

Key IT requirements for supply chain benefits mandate the integration of IT systems across the supply chain. Effective collaboration can only occur if all collaborating partners can easily access all supply and demand data. A second key IT requirement is a detailed set of standards for the online identification of goods, orders, and shipments. At present, industrywide standards are incomplete, and many individual firms are using their own standards for limited collaborative activities. Tesco, for example, has benefited from an extensive EDI system with standards and limited systems integration across the supply chain. The U.K.-based retailer now is extending these systems via the Internet to collaborate more effectively with partners through a flexible two-way flow of information.

Organizational Requirements

Organizational requirements define the structure and incentives needed to extract value from B2B e-commerce. An inappropriate organizational structure can represent a major hurdle to success. The organizational requirements vary depending upon where the company hopes to extract value from B2B e-commerce.

If a company wants to reduce transactional charges, the following organizational issues must be addressed:

- Is the online channel integrated with other channels for order taking?
- Are customers and employees aware of the online systems?
- Do the current incentives encourage procurement and supply chain staff, customers, and suppliers to use the online systems?

The following questions reflect the organizational requirements needed to gain value from price reduction through market efficiencies:

- Does the company have the resources to perform comprehensive due diligence on potential bidders?
- Can it centralize purchasing power to ensure aggregation?
- Are the incentives of the procurement staff aligned appropriately?

Traditionally, companies based incentives for their procurement people on the discount negotiated from the published price. Yet, an online system uses market efficiencies to drive down prices. In this new environment, the primary role of the procurement staff should be to increase liquidity (number of bidders) and the volume of purchases in order to

maximize market efficiencies. Basing incentives on the final discount achieved slows adoption of the new technology because buyers are likely to have a higher regard for their own negotiating abilities than that of the online mechanism's.

The right organizational structure is essential if the supply chain benefits of B2B e-commerce are to follow. The organizational issues are reflected in the following questions:

- Can offline relationships be transferred to online processes?
- Can the company build a "mirror" organizational structure at both the buying and selling levels to enable collaboration?
- Has the company identified the goals of collaboration and put in place measures to track performance toward these goals?
- Are incentives structured to encourage information visibility and collaboration both within and across organizations?

Companies can achieve supply chain benefits only if the parties that need to collaborate are clearly identified and only if they are offered the right incentives. These incentives should be based partially on their individual performance and partially on the overall performance. Collaboration will be sustainable only if incentives lead to sharing the benefits of collaboration.

There is no generic e-commerce solution that can be used by all businesses. Companies must identify the major sources of value that apply in their particular case. They

then must assess their supply chain strategy, IT strategy, and organizational strategy to determine what changes are required for the value to be realized. The key objective is creating a tailored e-commerce solution that supports the identified value opportunity.


cific needs. Most successful legacy systems have focused on extracting value by reducing transaction costs, matching surplus supply with demand, or gaining supply chain benefits. Few have been implemented to gain price reductions from suppliers. Legacy systems tend to be time consuming and expensive to build and maintain. Yet when properly implemented, they provide close integration with existing supply chain partners. It can be difficult, however, to incorporate new partners because these systems lack standardization. Good legacy systems work well from the standpoint of organizational structure because they tend to be built around proven existing processes. Successful legacy system implementations have included Wal-Mart and Dell. (Dell now has transitioned to off-the-shelf solutions.)

Off-the-Shelf Solutions

Off-the-shelf solutions provide more standardized capabilities and support all three of the identified areas of value. They are technically easier to implement than legacy systems, an advantage that translates to comparative savings in cost and time. The biggest weakness is that they come with pre-existing processes that may result in a less-than-complete fit for the company's precise needs. Another important consideration is the need to integrate across many best-of-breed systems since no single provider offers a complete supply chain solution. Addressing this issue, many best-of-breed providers are teaming up to provide a full suite of functionality. When implementing off-the-shelf systems, companies need to consider the future viability of the software provider. A good approach (if a company can afford it) is to start with a legacy system and then transition to off-the-shelf software as requirements within the company and capabilities of the outside software become clearer. Both Dell and Cisco have successfully implemented such an approach.

Public Marketplaces

Public marketplaces, such as Transora in the consumer packaged goods industry and Covisint in the automotive sector, are set up by third parties or a consortium of companies to facilitate B2B e-commerce. Current public marketplace capabilities focus on market efficiencies and to some extent on reducing transaction charges. At present, very few public marketplaces increase supply chain visibility or foster collaboration to extract supply chain benefits. A potential—but as yet unrealized—strength of public marketplaces is the ability to develop industry standards that allow seamless information exchange. The sharing of costs lowers the individual cost for all participants. Joining the marketplace itself, however, is not a competitive advantage because all of the participants have access to the same capability. Given the flow of financial transactions and proprietary information, security concerns are significant in public marketplaces. Importantly, companies must consider future viability when selecting public marketplaces because



Achieving visibility is comparatively easy because it only requires the implementation of the right technology; collaboration is much harder.

then must assess their supply chain strategy, IT strategy, and organizational strategy to determine what changes are required for the value to be realized. The key objective is creating a tailored e-commerce solution that supports the identified value opportunity.

What Are the Current Market Options?

The last critical activity is to analyze the market options for implementing B2B e-commerce. The market is classified in two ways. The first way considers the development of the software: legacy systems or off-the-shelf solutions. The second considers how the companies participate in the resulting B2B e-commerce: public marketplaces or private marketplaces. Both public and private marketplaces can be developed using either legacy systems or off-the-shelf solutions.

Legacy Systems

Legacy systems are developed to support a company's spe-

many may not survive.

Private Marketplaces

Private marketplaces typically are set up by large companies to facilitate B2B e-commerce between members of their supply chain. Private marketplaces focus primarily on reducing transaction charges, matching surplus capacity with demand, and gaining supply chain benefits. Setting up a private marketplace incurs higher expenditures of cost and time relative to joining a public marketplace. The effectiveness of private marketplaces is proportional to the volume of transactions made by the players that choose to join. Even if few choose to join, the benefits can be large if those players represent a large portion of the supply chain transactions. Thus, a private marketplace between Dell and Intel can be valuable even if there are no other participants. A downside relates to the different standards and infrastructure requirements that potentially could exist at each private marketplace. Smaller players also face the issues of trust and leverage. Our opinion is that for private marketplaces to be successful, the dominant party setting up the marketplace must resist the temptation to gain market efficiencies by driving down supplier prices.

Exhibit 4 summarizes the relative effectiveness of the various market options available. Companies can choose the option that best supports the sources of value it is emphasizing.

A Tailored Approach Needed

Use of the Internet for B2B e-commerce offers three main categories of value: reduced transaction costs, marketplace efficiencies through reduced prices or better matching of surpluses and shortage, and supply chain benefits. Within each category, the value will differ from company to company. Thus, before designing an e-commerce strategy, a company must carefully analyze the value provided by each category as well as the effort involved in deriving this value.

Reducing transaction charges by using the Internet is relatively easy because it can be accomplished by implementing the technology; little strategic or organizational restructuring is required. The benefits of going online in this category will be less for companies with existing EDI systems and greater for companies currently conducting many small transactions mostly via paper/phone/fax.

Price reduction through market efficiencies can benefit companies in industries requiring limited buyer/seller qualification and exhibiting a fragmented market with many players on the buy or sell side. Using the Internet to reduce supplier prices is unlikely to provide sustainable value in industries where supplier qualification is required or where long-term contracts predominate. In fact, a focus on price reduction

EXHIBIT 4

Effectiveness of Existing Solutions

Considerations	Legacy	Off-the-shelf	Public Marketplaces	Private Marketplaces
Transaction charge reduction	●	◐	◐	●
Market efficiency	○	◐	●	○
	●	◐	◐	●
Supply chain benefits	●	◐	◐	●
Implementation time	●			
Start-up costs	\$\$\$\$	\$\$	\$\$	\$\$\$
Ongoing system costs (i.e. upgrades, further developments)	\$\$\$\$	\$\$	\$	\$\$
Systems integration problems	◐	◐	◐	◐
Security problems	◐	◐	●	●

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may hurt long-term supplier relationships, inhibiting future collaborative activities. Industries that are highly fragmented can benefit greatly from online marketplaces that aggregate demand and smooth order variability—capabilities that reduce overall supply costs and lead to sustainable improvement. Potentially, the greatest area of value for market efficiencies is matching surplus supply/capacity with unmet demand. This area is particularly suited for companies with a high level of flexibility, which allows them to pool and absorb variable demand from customers.

Supply chain benefits from B2B e-commerce are likely to be greatest in industries with complex supply chains, long delivery lead times, low inventory turns, low supplier visibility, little collaboration, or short product lifecycles. These benefits arise primarily from the Internet's ability to enhance visibility and facilitate collaboration within a supply chain. Supply chain benefits remain the most difficult to realize given the high degree of strategic, IT, and organizational restructuring required. Companies with strong supplier and customer relationships and technologically enhanced transaction processes such as EDI can most easily extract supply chain benefits from B2B e-commerce. Companies that are weak in these areas, on the other hand, must address key strategic, IT, and organizational requirements before they can extract any benefits from B2B e-commerce. For these organizations, moving the supply chain online will likely be a time-consuming and expensive process. But failure to move on this front will only put them farther behind the leaders in the long run.