

AN IPC WHITE PAPER

●
*THE MYTHS
OF
E-COMMERCE*

produced by the

*IPC E-Business
and
Supply Chain
Committee*

●



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

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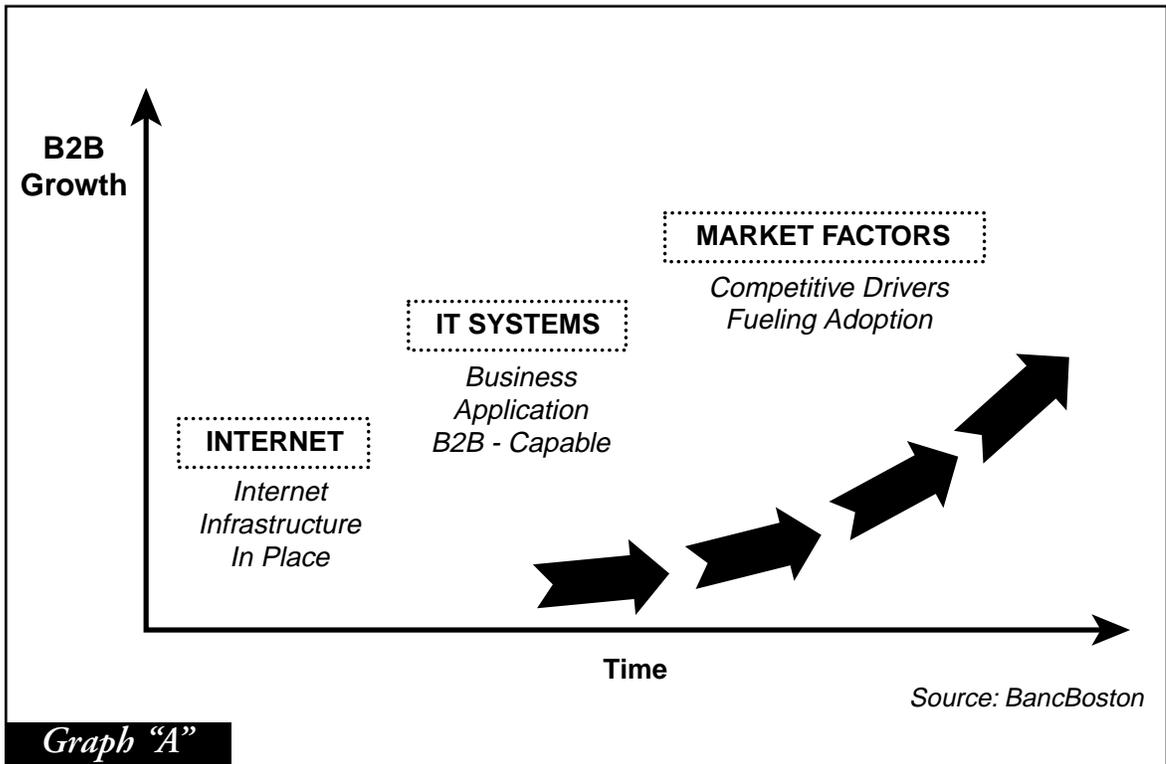
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EXECUTIVE OVERVIEW

by Mehul Davé, Cimnet Systems

The overall growth of e-business has been dramatic and will continue to be fueled by business-to-business activity. E-business offers the opportunity for businesses to establish new competitive standards by expanding distribution channels, integrating external and internal processes, and offering a cost-effective method of providing products and services. The Internet provides online businesses with the ability to reach a global audience and to operate with a minimal infrastructure, reducing overhead, and providing greater economies of scale, while providing customers and businesses with a broad selection, increased pricing power, and unparalleled convenience.

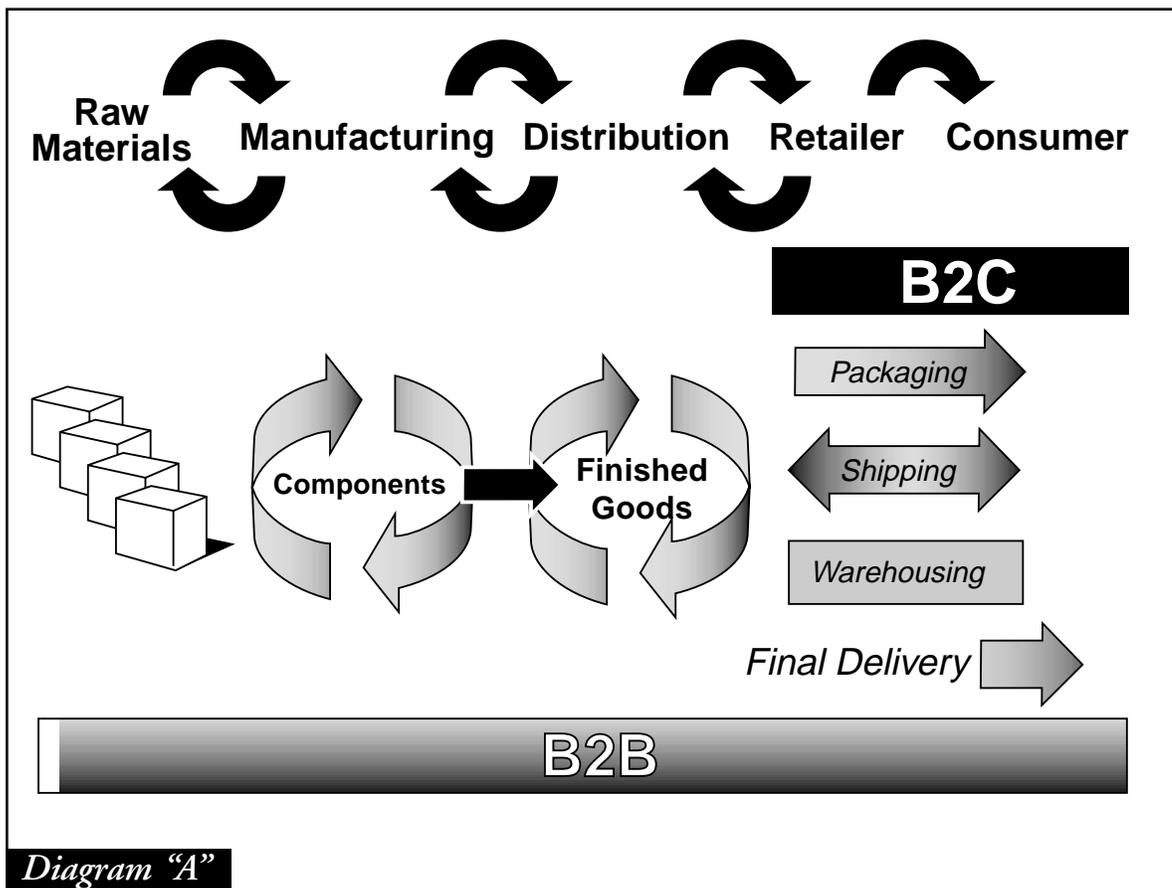
As shown in the graph below, we are reaching the inflection point for significant e-business adoption.



The Internet technologies and infrastructure are in place to exploit this revolutionary technology; industry competition is driving companies to adapt quickly. The electronics industry will be at the forefront of this activity due to the intense time-to-market and time-to-volume pressures.

The projections for e-business activity are staggering. Forrester Research predicts that the total volume of e-business will exceed \$6 trillion by the year 2004. The uptake of e-business will evolve over time, starting with service offerings that are relatively easy to implement with less business impact to more complex capabilities involving connectivity to internal back end systems.

The business-to-business (B2B) model is much more complex compared to the business-to-commerce (B2C) model, which is more prevalent today. B2B spans the full spectrum of business processes, from raw material to the consumer.



As diagram ("A") shows, one of the key elements will be the ability to manage end-to-end business transactions throughout the supply chain. This is becoming even more critical as the trend toward outsourcing in the electronics industry continues at a rapid pace. In order to reduce waste trapped in the supply chain and automate various business processes, all the key players will need to be linked together:

- **OEMs**
- **EMS Providers**
- **PCB Fabricators**
- **Raw Material Suppliers**
- **Component Suppliers**

Along with any new enterprise, invention, or variation on the familiar come myths. Some of the widely-held myths about e-commerce are:

1. **"E-commerce is 5% technology and 95% business"**
2. **"E-commerce will replace purchasing."**
3. **"E-commerce is a zero-sum game."**
4. **"E-business represents Interesting Opportunities but for the distant future."**
5. **"E-commerce is only about exchanges."**

The impact of e-commerce will be significant and the time to get prepared is now. The objective of this white paper is to educate the readers and dispel some of the myths concerning e-business so that they are in a better position to adopt this new way of doing business.

Myth #1: “E-Commerce Is Primarily About Technology”
(“E-commerce is 5% technology and 95% business”)

by Gerry Haller, FastParts.com

E-commerce is primarily about technology. That is what most people, including those in the electronics industry, are saying. Vice President Al Gore preaches it, and Alan Greenspan has taken up the ‘technology’ mantra. They say, “e-commerce is the embodiment of new technology.” I believe that these learned men are WRONG. Business is still business, and e-commerce is just business adopting new methods to improve efficiency.

E-commerce and the Internet (because they are so tightly entwined, let’s just call them E-C) are five percent technology and 95 percent business, where business can easily be defined as AGREEMENT among the participants.

Agreement in business encompasses many things, often boiling down to: you agree to sell and I agree to buy. The identity of what is being bought, at what price, and on what terms are important ingredients of our transaction. There are other, almost automatic, ingredients. Many are encompassed in the Uniform Commercial Code. Others fall under the Rubric of Standard Business Practice, such as verbal orders vs. written ones. Transacting business has always taken agreement among the participants. E-commerce is simply business as usual in which we are substituting ‘technology’ for five percent of what we’ve always done in the past. That technology is dramatic, but it isn’t complicated.

E-commerce as we know it today was technically possible in 1970. All of the technical pieces were in place: telephone lines, modems, mainframes, mini-computers and programming languages. It was a proprietary world. One company controlled long distance, and another controlled 90 percent of the computer mainframe marketplace. The rule of the day was, “My way, the right way, the only way,” resulting in a “Tower of Babel” environment in which no one computer could communicate with and understand another computer. E-commerce might have been slower but it would have worked.

In 1973, there surfaced a group of widely dispersed, intelligent and interested individuals who were financed by the biggest spender of them all, the U.S. Department of Defense. These academics and scientists wanted their computers to ‘talk’ to each other, and they wanted to break the computer manufacturer’s proprietary stranglehold so that any manufacturer’s computer could talk to another manufacturer’s computer.

To achieve this goal, this group agreed to communicate using a set of predetermined rules. It was five percent using technology and 95 percent agreement on the process. Think of it as adopting a Uniform Code of Communication. E-commerce really started with ARPANET, which is E-C’s true inflection point. It was the participants’ agreement on how to achieve a goal that eventually succeeded in their destroying the computer communications’ Tower of Babel-not the technology.

They learned from experience until TCP/IP and its inherent addressing scheme whereby every 'resource' on the network has a unique address (URL = Universal Resource Location) is today the guts of what makes the whole e-commerce world operate smoothly and accounts for two percent of the e-commerce effort. Three percent of the e-commerce effort is attributable to the Internet browser adapted from the old publishing standard, Page Markup Language.

E-commerce is the result of using communication facilities, computers, and programs to permit instant interaction between any two or more resources on the network, no matter where on the planet they are located. What business is doing is substituting a new way of executing business transactions for an old way-and benefiting from the improved efficiencies. The telephone and airplane were technologic tools that improved business transaction efficiency when compared to the telegraph and train. To harvest the potential results of E-C, the electronics industry will require more agreement, not less, than it has in the past.

Technology's five percent of e-commerce is in place and is being used by other industries. What is not in place in the electronics industry is agreement on adopting a Uniform Interactive Communication Code, to be used by all electronics industry participants for the transacting of business over this new medium. One set of rules may be no better than another set, but it is crucial that there be only one set of rules or one standard. That will take agreement and that gets us back to business.

E-commerce is still five percent technology and 95 percent business, and the electronics industry has a large business issue on its plate that must be resolved before it can, as an industry, enjoy the benefits of e-commerce. Achieving that essential agreement requires the services of a neutral third party can bring all of the interested parties together and work toward agreement and not one set of rules over another set of rules. Fortunately, the electronics industry has IPC and its experience in bringing strong-willed interests together to establish standards that, in the end, benefit the whole industry. E-commerce is not technology, but it is agreement on a set of transaction rules. That is what business is all about.

Myth #2: “E-Commerce Will Replace Purchasing”

by Guy Hayden, PartMiner

The purchasing function has undergone a series of evolutionary changes. Twenty or 30 years ago, the purchasing function might best have been described as driving down the cost of materials or equipment, period. The perceived benefits to the purchasing agent, because of the selling process, included long luncheons, sports tickets, and vacations.

As the electronics industry - and business for that matter - began to embrace quality as a matter of survival, to be embraced by rapidly changing technology, the purchasing professional (no longer the “buyer”) turned his attention to other metrics. These metrics, not surprisingly, included quality, on-time delivery, and product innovation, probably best described as lowest total cost in use.

And today? As outsourcing kicks into hyper-growth and the supply chain gains ever more significance, purchasing professionals are evolving into relationship managers. Industry suppliers and their performance can literally make or break the customer.

Overarching these trends are generational changes. The accepted business practice of the three-martini dinner and a long night out with the supplier has been supplanted. Now it's, “I need the information 24/7, because I have to coach my son's baseball game.”

Where do e-commerce and e-business fit in?

When a company embraces an e-commerce mentality this may be viewed by the Purchasing Department as a threat, since it may perceive a diminishing role in the procurement process. However, the reality is that the buyer will likely take on an expanded role in the purchase order placement process. Now both product knowledge and PO placement are available 24 hours.

Extensive product databases exist online that allow the buyers to access data sheets, cross-reference product, address upgrades, deal with obsolescence, and locate hard-to-find products at night ... right after the Little League game.

For a more knowledgeable materials management person, there is less dependence on design/product/quality engineering in working up a Bill of Materials.

In the Order Placement arena, a buyer now has fingertip access to a large number of suppliers for product availability, pricing, delivery and terms. Offers can be effectively analyzed and business partnerships formed to exchange product and business data on a regular basis.

Phone calls, faxes, and visits will be reduced as trust is developed based upon performance. Sophisticated databases will allow buyers to easily track vendor performance via a large number of metrics to obtain the lowest cost of ownership.

The e-commerce model changes a buyer's role from inefficiently shopping POs to a large number of suppliers via ineffective communication methods into one of managing a BOM in a reduced amount of time. This new role creates a flexible, better informed individual and renders the Procurement Department an integral component of the entire manufacturing process.

Myth #3: “E-Commerce Is a Zero-Sum Game”

by Jeff Ferry, Circuit Technology Center

You've operated a successful - maybe even market-leading - business for decades. You've built a bond with your customers through face-to-face sales and quality customer service. Now the bold new world of e-commerce and the electronic marketplace has dawned and you view it as a threat to all your hard-won efforts. Should you be worried? Are the projected savings these electronic marketplaces are talking about going to come solely at your expense? Is e-commerce going to crush your margins? Is e-commerce a zero-sum game?

You do have reasons to be concerned but only if you stand on the sidelines. Over the next few years, B2B e-commerce is projected to explode. Even if you discount the most conservative projections by 50 percent, the numbers are still enormous! While some businesses will fail, most businesses will benefit from the inevitable changes e-commerce will deliver.

E-commerce in the electronics manufacturing market is about improving the effectiveness and efficiency of the supply chain by automating processes. The savings you hear so much about are estimated to come from a reduction in transaction costs, a reduction in inventory costs, and a reduction from the resulting migration toward using standardized parts. The savings within each of these categories may be small at one or two percent but in the mega-billion dollar world of electronics manufacturing, the numbers are truly significant.

Because they're a bit less complicated, early e-commerce models within the electronics manufacturing supply chain have focused on auctions. These auctions are competitive environments where sellers have been forced to compete at lower prices, and thus they have created savings for buyers. Other than finding a few new customers, these auctions sites have offered little economy to the seller. From a seller's perspective, these auction sites may be viewed as a zero-sum game.

Auctions

Online auction sites that help buyers lower their costs based on price alone are not enough. Online auctions will soon incorporate other essential factors into the bidding process, including supplier standards, international currency exchange, shipping costs, financing, credit, insurance, delivery times, and other associated details of the supply chain. These essential elements will help buyers make more informed decisions. Price alone will not be the driving force for buyers when they select a seller.

Following auction sites where the focus is cost reduction via the dynamic of the auction environment, the next wave of e-commerce models will offer significantly greater levels of integration for both buyer and seller.

These full-scope B2B marketplaces will become an important and valuable trading vehicle including cataloging, collaborative supply chain planning, forecasting, engineering change management, and much more. At the same time, these activities will be integrated within the buyer's and seller's underlying logistics infrastructure. The benefits of better communication between buyer and seller will offer efficiency to both parties.

If you are a buyer, it is easy to imagine the benefits and savings these electronic marketplace and auctions will drop to your bottom line.

If you are a seller, it's understandable that you would view the new world of the electronic marketplace as a threat, but the Internet and the electronic marketplace present great opportunities for you. Forward-thinking selling organizations will soon embrace e-commerce and the electronic marketplace to lower their costs and strengthen customer relationships. You may get a few bumps and bruises, but e-commerce will not be a zero-sum game for those willing to step onto the playing field.

***Myth #4: “E-Business Represents Interesting Opportunities ...
But For the Distant Future”
 (“E-Commerce will go away. It’s a passing fad.”)***

by Paul Davé, Interconexus

More than 100 years ago, the technological convergence of steam power, mechanical engineering and material sciences led to the industrial economy. There were naysayers back then-

“Railroads will only encourage the common people to move around needlessly.”

-The Duke of Wellington

Today we have seen a similar convergence of technology, computing, communication and content technologies, which is fueling the new electronic economy through e-business. There are still naysayers.

“I don’t think other companies are doing much more than we are. There is no need to hurry this.”

- Fortune 500 CEO

Herein lies one of the central myths regarding e-commerce and, more broadly speaking, e-business. The myth centers on the notion that once the hype surrounding e-business subsides, everyone will go back to business as usual. Alternatively, e-business may be a wave of the future but not the present. Therefore, it is not something that deserves executive mind-share right now.

There are several fundamental reasons why e-business is not only the wave of the future, but very much a competitive threat and opportunity facing companies today.

We shall attempt to shed light on this issue from multiple perspectives. First, we will discuss changes to several underlying economic assumptions, which are in turn driving e-business. Secondly, we will explore these changes in the context of their impact on key business value drivers. Thirdly, we will review the marketplace response to e-business and trace the irreversible path that e-business is taking.

Changes to Economic Assumptions

Degree of Vertical Integration

Traditional Economic Assumption: The costs of interaction and collaboration are sufficiently high to warrant increasing levels of vertical integration.

Evolving Economic Reality: The trend toward a frictionless economy with significantly lowered costs of interaction and collaboration are driving 'best-of-breed' specialization and network-based value delivery.

This trend is clearly evident in several industries-notably, in automotive manufacturing, electronics manufacturing, the computer software industry, etc. Given the ubiquity of the Internet and decreasing costs of information sharing, many of the traditional barriers to effective dynamic partnering and best-of-breed approaches are collapsing. Companies are refocusing on core competencies and looking to partner and/or outsource areas of their business that fail to provide clear and sustainable competitive differentiation.

Access to Information

Traditional Economic Assumption: Accessing customer and supplier information is both difficult and expensive, which translates to customer lock-in and profit opportunities for suppliers.

Evolving Economic Reality: Competitive advantage based on information asymmetry will prove to be short-lived.

Traditionally, companies enjoyed higher returns given the high costs associated with searching for alternative suppliers, comparing pricing, effectively gauging supplier capabilities, etc. However, this is rapidly changing. Customers no longer require physical proximity to perform supplier screening or high-level due-diligence. Material positions, price transparency, and performance metrics provide objective and easy-to-assemble measures of business capability. Customers continue to demand more information transparency and increasingly turn to global providers. Both customers and suppliers become better informed, resulting in competitive differentiation based on innovation, delivery capability, defensible pricing and value-added services.

Time to Market

Traditional Economic Assumption: Entering a market requires both the establishment and coordination of physical assets, means of design, production, sales, service, and delivery.

Evolving Economic Reality: Market entry in the electronic economy can be greatly accelerated by adopting virtual means to achieve traditional business functions.

In today's e-business environment, new entrants can enter markets far more rapidly than ever before, achieve scale more quickly and take market share from incumbents almost immediately. Competing on Internet time and at Internet speed is becoming a reality for most businesses. Growth in fabless semiconductor business and the adoption of other virtual manufacturing models simply underscores this trend.

Nimble new competitors based in the new economies can create compelling value propositions, which boast of faster product, lower prices, improved quality and global reach. Companies anchored in the traditional set of assumptions are being forced to respond.

Impact On Key Value Drivers

These changing economic assumptions within the context of the electronic economy have direct impact on economic value-add for manufacturers. Three primary value levers are exercised through the adoption of e-business.



The associated value propositions can be quite compelling and span many of the key dimensions of business performance and success. In this context, e-business is clearly much more than just an electronic sales channel or an MRO procurement alternative, as many have defined it to be. Those who have been willing to adopt an e-business perspective are seeing tangible economic results.

Irreversible Path Of Change Currently Underway

Several factors suggest that e-business is well underway and very much a reality today:

- Infrastructure to conduct e-business is largely in place within the United States and is in rapid deployment mode globally. The Internet is a mass medium.
- Regulatory environment has been favorable for the most part.
- Business applications are rapidly being developed and deployed to help companies bridge the gap between e-business potential and realizable benefits.
- Competition continues to heat up, with e-business adoption acting as a key lever for competitive differentiation.
- E-business and globalization are tightly coupled and mutually reinforcing.
- Economic benefit through the adoption of e-business can be significant and is being realized by pioneers and pragmatists alike. We are past the early adopter stage.

Given the continued investment in tools, technology, and e-business infrastructure, the barriers to e-business adoption continue to fall and the competitive threats associated with complacency continue to rise.

Conclusion

Technological convergence is having a profound impact on businesses, much as other converging forces had during the industrial economy. The emergence of the electronic economy and fundamental changes in economic assumptions are driving the need for e-business. The bottom-line impact has significant potential and is being realized by many companies today. We are on an irreversible path down the e-business adoption curve, and companies are faced with both an opportunity and a threat. However companies perceive e-business, there is precious little time to continue standing on the sidelines.

Myth #5: “E-Commerce is Only About Exchanges”

by Geoff Wild, TheSupply.com

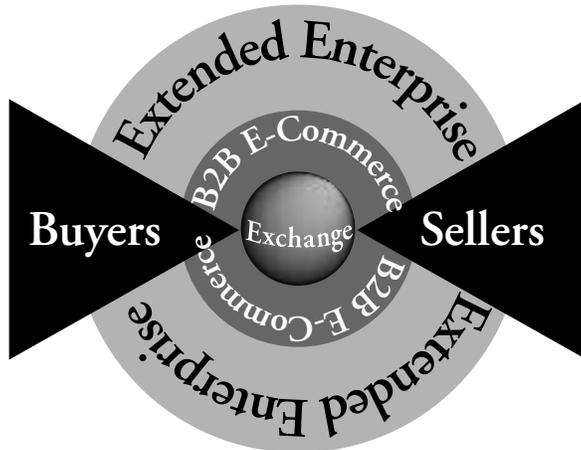


Figure 1. e-commerce Model: Exchange, B2B Commerce and Extended Enterprise

E-commerce is about business processes as well. E-commerce is a win/win for all participants. It is about technology integration.

The Internet brings buyers and sellers closer together to exchange goods and services. Resultant trades are then made electronically and shipped traditionally. There are three distinguishing layers in e-commerce, which help realize the power brought to today's economy by the Internet.

The features of an exchange are order matching, settlement and fulfillment. Net markets are like trading posts where products change ownership. B2B e-commerce goes through several internal business processes before realization of the trade. The ultimate power and use of the Internet is to extend the enterprise boundary through B2B integration to achieve end-to-end visibility of the whole commerce chain. The best companies integrate with their best suppliers, partners, and customers to create a virtual super-corporation. This extended enterprise creates significant competitive advantages for all constituents and barriers to entry for new comers.

As illustrated in Figure 1, exchange is about executing orders after the purchasing decision has been made, but it is a myth that this is the sum-total of e-commerce. B2B e-commerce includes purchasing decisions and approval processes inside the enterprise. The real work of the extended enterprise, however, takes place before any purchasing decision can be made.

Knowledge of conditions of inventory, work in progress, planning, and forecasting is needed in order to make optimal decisions. Enterprises collaborate and share information from deep inside each collaborating business with the foresight to integrate enterprises across certain markets; this is the foundation of B2B collaborative e-commerce.

Exchange

The actual order exchange is the most visible function, since it is right at the heart of B2B e-commerce. It involves execution of the order after the purchasing decision has been made. The features of an exchange are order matching, settlement, and fulfillment.

Order Matching

Order matching usually takes two major forms: static and dynamic pricing, depending on the liquidity of the exchange.

Static Pricing

Static pricing is also called catalog ordering. The pricing itself can be either prefixed by suppliers or pre-negotiated between suppliers and buyers. This is currently the preferred route for most purchasing in the printed circuit board industry.

Dynamic pricing

Dynamic pricing is mostly used for true commodity products, because orders can be matched instantly. In dynamic pricing, the exchange matches the order in real time as bids and quotes come into the marketplace and prices are then adjusted automatically.

Settlement

Today, typical exchanges use third parties for settlement such as Purchasing-Cards, escrow payment through banks, and B2B payment networks. But because average order sizes usually vary between \$50,000 and \$250,000 for most exchanges, instant settlement is the preferred method for both parties.

Fulfillment

Fulfillment is the most complicated, costly step in the process, but also is the step with the greatest savings for buyers and sellers. B2B orders are critical for the buyer, since the buyer may have a customer waiting or a plant down waiting for the part. The simplest fulfillment can be shipping and delivery, but in its most complex form there are many aspects of supply chain management to be considered.

The future trend is toward very low-cost services for order matching and settlement. Simple exchange of orders is not a glamorous business. The myth that e-commerce is only about order exchange may depict current industry status rather than the nature of e-commerce as it is emerging. Most businesses are just starting to examine e-commerce solutions and the exchange is certainly the most visible for those starting out on the journey.

B2B E-Commerce

A business is a collection of many individuals. Decision-making is a process. B2B e-commerce offers significant value beyond the order-matching events in an exchange. For example, the New York Stock Exchange supported \$7.3 trillion in trading, but generated only \$101 million revenue in 1998. However, Merrill Lynch, a linked brokerage house, had revenue of more than \$1000 million in 1998. Companies like Merrill Lynch have taken their businesses way beyond the simple exchange of contracts. Companies such as Merrill Lynch help their customers make educated decisions. The difference is knowledge, value offered, and trust. Similarly, B2B e-commerce and the best exchanges are fast developing additional features such as supplier sourcing, requisition routing and approval, content management, and collaboration among businesses.

Supplier Sourcing

An early first step in B2B commerce is supplier selection/qualification to secure quality, availability, price, and capacity. Today's buyers need to know more about their suppliers than ever before. This can be a long process. For high tech products used in the printed circuit board industry, information is frequently proprietary for both processes and methods. Fortunately some of the new design and collaboration tools being developed massively aid in this task. And the new e-catalogs being produced are revolutionizing the task of providing buyers with the most comprehensive information possible. Much of the information is dynamic and can be automatically linked to laboratory information management systems for real time access to analytical and statistical data.

Requisition Routing and Approval

The purchasing enterprise typically has an internal approval process to align the interests of employees and the business. E-commerce software generally incorporates the approval process into an automated paperless workflow. Requests are routed to the appropriate managers for their approval and there is a major increase in control of the supply chain and a consequent reduction in maverick spending.

Content Management

The catalog documents product, price, and sometimes live availability information. Some large customers currently host their own multi-vendor catalogs behind their firewalls but this is likely to change as complexity and outsourcing increases. Companies are able to add proprietary content and rules to the catalog to control purchasing behavior both inside and outside their organizations. Some suppliers will only show their content to selected customers. Some customers will not allow their suppliers to show certain content to the competition. All of these requests, and more, are being accommodated in the new modern exchanges and B2B purchasing platforms.

Collaboration

There are, of course, many relationships among trading partners in the B2B world. Most parties have some form of real-time information systems they would like directly linked to systems of record on both ends. This linking process over the Internet eliminates inefficiencies and information gaps caused by duplicate and redundant data entry. The ability to assist collaboration between trading partners represents a tremendous opportunity for net-market makers. B2B e-commerce represents the full range of business processes and interactions between trading partners such as searching, financing, ordering, tracking, receiving, inspecting, installing, testing, maintaining, and selling redundant stock or equipment. Advanced collaboration and program management software available today gives e-commerce more teeth to bring relevant context, community attributes, and enhanced value.

E-commerce can address the full range of processes that characterize business-to-business interaction. Each enterprise becomes part of larger supply and demand chain that is dependent on many of these processes.

Extended Enterprise through B2B Integration

E-commerce can integrate enterprises seamlessly into linked chains of commerce to provide customers tightly integrated supply and demand chains. It can facilitate the rapid exchange of relevant information leading to improved purchasing behavior and substantially lower costs. For example, buyers would like to know capacity, inventory levels, quality metrics, lead-times and status of work in progress. In turn, suppliers would like to know inventory levels, performance data, work in progress, and forecast information. By synchronizing customers' demands and forecasts with suppliers' planning, and delivery logistics, true auto replenishment and major combined inventory reductions can be achieved. Such true automation across enterprises is starting to enhance productivity enormously. True automation can only be achieved through tight B2B integration and close collaboration using the integrative power of the Internet.

A few visionary companies, such as Cisco Systems and Sun Microsystems, are already well advanced in establishing extended enterprises to compete in the new Internet economy. An extended enterprise combines the Internet's power with new business structures and processes to eliminate old corporate boundaries and geographical restrictions. It networks commerce chains to create seamless paths of communication among partners, suppliers, manufacturers, retailers, and customers. These companies are moving beyond simple order exchanges toward tightly integrated extended B2B enterprises. The digital economy is here and it is driving major competitive advantages.

Cisco Systems is often quoted as a leading example of how a company can leverage the power of an extended enterprise. The company claims to save over \$175 million annually. Yet Cisco puts its customers first - more than 80 percent of Cisco product orders are now placed via the Internet, translating to \$36.7 million in business per day. Supply partners fulfill more than half of these orders directly. And customer satisfaction ratings have soared since the company implemented this online ordering process.

Extended e-commerce allows Cisco and others to provide superior customer service: the promise of consistent, on-time, quality products, with lower costs. Customers place orders on a web-based front end, and they are promised delivery dates based on live availability data from their suppliers. Order fulfillment is then driven by the company's ability to immediately communicate orders to the enterprise members who then manufacture, test, and deliver products at unprecedented costs and speeds.

In an extended enterprise, each supplier and partner can securely access key business information and each is empowered to make informed decisions to best serve customers. The benefits include:

- Faster inventory turns throughout the commerce chain, reducing both inventory carrying costs and overall product cost base
- Enhanced customer satisfaction through online order entry and configuration
- Flexibility to design, ramp up, and retire products rapidly in response to customer and market demand
- Shorter engineering-to-production cycle time to increase market share
- Ability to sustain product quality while outsourcing major portions of the fulfillment process

Win/Win

B2B relationships are about collaboration. E-commerce enhances B2B relationships by extending enterprises and creating new virtual corporations. In these virtual corporations individual companies can concentrate on their own links in the demand and supply chains while taking advantage of recombinant business models. A close collaboration of highly skilled and specialized companies operates in synchronization. Together, they deliver the very best products and services to their customers as a vertically integrated company. Specialization is the result of the Internet economy and synchronization delivers e-commerce values effectively. In these new chains of commerce, if any one partner fails, the commerce chain fails and the virtual corporation fails. For these reasons, most e-commerce infrastructure companies emphasize "many-to-many" business models, which emphasize the equality of all participants. Intermediaries, or e-commerce net-market makers, emphasize their neutrality and offer services and added value for both buyers and suppliers.

Technology Integration

To unleash the maximum power of e-commerce, customers' systems may need to be re-engineered to add value in a cost-effective way. E-commerce solutions enable enterprises to conduct transactions online with suppliers, business partners, and customers through web-based interactive applications, supported by secure and robust systems and network infrastructure. Today's e-commerce has four major building blocks: Internet infrastructure, enterprise application, marketplace, and collaboration.

"Internet infrastructure" includes web servers, routers, security controllers, Internet connections, databases, operation systems, and middleware. "Enterprise applications" include ERP/MRP, HR, finance, and inventory management systems. "Marketplace" includes order matching, settlement, fulfillment, logistics, and warehousing. "Collaboration" includes product data management (PDM), product content management, supply chain management, CPFR, and quality. Today, no one software company offers a complete solution, so it is left to net-markets or individual companies to put this jigsaw together. The creation of an e-hub can easily cost in excess of \$30 million and can make it extremely challenging to put the jigsaw together.

Summary

E-commerce consists of three distinguishing layers: exchange, B2B e-commerce, and the extended enterprise. The myth and perception that e-commerce is only about exchanges may depend on where you are standing. Most businesses are only at the stage of the exchange. Large companies are moving quickly toward true B2B e-commerce. Very few are establishing extended enterprises. The ultimate power of e-commerce will be realized by extended enterprises in which specialists tightly integrate into a commerce chain to form a virtual corporation. E-commerce can be a winning proposition for all participants.

How E-Commerce & E-Business Can Provide Significant Benefits to the Supply Chain

by Saeid Ghafouri, WebQuote.com

In general, the promises of the Internet economy are:

1. Reduced cost of doing business for all parties involved
2. Better visibility in the supply chain
3. Better control over the available resources - whether they are inside the enterprise or external

In order to evaluate the benefits in our industry, we will devise a simple model of the supply chain.* In this model, the supply chain starts with end customers, whom we will call the consumer, and ends with raw material suppliers.

1. Consumer

In our example, this could be a company buying a piece of networking equipment.

2. Original Equipment Manufacturer (OEM)

This would be a company such as Cisco, which would provide the networking equipment.

3. Electronics Manufacturing Services Company

This would be a company such as Solectron, which would assemble the PWB for Cisco.

4. Parts Supplier

This would either be a semiconductor company like Motorola or a distributor like Digikey. In this example, the company would supply the electronics components to Solectron.

5. PWB Manufacturer

This would be a company like Tyco. They would supply the bare board into Solectron.

6. Material Supplier

An example would be Rogers. They would provide raw materials to Tyco.

* The example is a simplistic model of the supply chain. In reality, the supply chain is far more complex. There are many more connection points between various buyers and suppliers. In its simplest form, Internet lowers the cost of transactions between such connection points. If we accept that premise, it is a natural conclusion that the more complex the supply chain, the more benefits the participants derive.

Now, let's analyze the first-order benefits the businesses as well as individuals will gain through our supply chain example. We will assume that all participants in this chain are conducting business through the Internet.

1. Consumer

They buy their networking equipment online from the OEM.

- a. Benefits to the individuals
 - i. Online decision support tools coupled with online data availability about the products reduce the cost and time it takes to select the right product. People involved in this process can do a lot more in less time and be assured that their decision was based on facts, data, and objective measures.
 - ii. People involved do not have to spend time tracking signatures for authorization because all the authorization tracking is done online. Again, they spend time on more value-add functions instead of chasing paperwork.
 - iii. Available online rating systems that are based on the vendor's actual performance make vendor qualification much easier and more objective.
- b. Benefits to the business
 - i. Buying process is more efficient-the company saves resources. Increased profitability.
 - ii. Better equipment is purchased at lower prices. (See 2 below for lower cost and better products.) Increased profitability.
 - iii. Better product availability. Demand aggregation will result in better forecasting for the OEM and the rest of the supply chain. This will result in OEMs bringing the right volume of the right products to the market to meet demand.

2. Original Equipment Manufacturer (OEM)

They sell their products to the consumer online. They access online data books of components during the product design cycle. They also buy their material as well as MRO online.

- a. Selling online. This reduces their sales and marketing cost. They reach a broader base of consumers without having to establish multiple offices. Because order fulfillment is part of the transaction, there is no need for double entry. All in all, the selling process becomes far more efficient and paperwork is reduced. Increased profitability, some of which will result in lower product prices.
- b. online Design Assistance. Design cycles become more efficient because the component availability data from online resources ensure that products are designed with better-priced components that are available for production. Shorter design cycles and more cost-effective designs.
- c. online Procurement. In addition to all the online buying benefits listed above for the consumer, there are other significant benefits that are realized because of supply chain automation:

- i. online and real-time visibility in the supply chain allows for better product and volume planning.
- ii. Better connection to the manufacturers results in elimination of the time gap that exists between design completion and manufacturing start. This, of course, leads to shorter time to market.
- iii. Since the supply chain is more efficient, suppliers to the OEM have a lower cost of doing business. This results in lowering their prices, which will again help in overall product cost reduction for the OEM.

3. Electronics Manufacturing Services Company

They sell their products and services to the OEM online. They also buy their PCBs and components online.

Like the consumer and the OEM, the EMS will enjoy all the benefits of buying and selling online as mentioned above. Since they are in the middle of the supply chain, an additional benefit for the EMS is that they will be able to reduce their RFQ-to-bid time to hours instead of days. This will further reduce their business costs and help their customers with better planning. Customer satisfaction.

4. Parts Supplier

This would either be a semiconductor company like Motorola or a distributor like Digikey. They would supply the electronic components to Solectron in this example. online intermediaries help buyers find parts from a variety of suppliers. This benefits the buyers. This also provides a lower-cost method of customer acquisition for the suppliers. Components and their availability are a very critical part of product delivery to the market. The benefits of the online procurement and sales as mentioned in the previous section (such as better product planning) are even more pronounced for parts procurement.

5. PWB Manufacturer

This would be a company like Tyco. They would supply the bare board to Solectron.

PCB manufacturers benefit by:

- a. Reducing their sales cost. E-business can automate their entire sales operation. They will have instant online availability of all their sales and order status from anywhere in the world. Because prices are cost-based and centrally managed, they will have the ability to set the prices for all their operations on a daily basis, based on market and factory loading conditions. More efficient business processes lead to more profitability.
- b. Reducing their cost for raw materials. E-business systems can automatically order the raw material they need for their booked orders. These systems can search the web for the best price and availability, thereby reducing the procurement cost for the manufacturers. Reduction in the buying cost will result in more profitability.

6. Material Supplier

An example would be Rogers. The company would provide raw material to Tyco.

The benefits to the material suppliers are twofold:

- a. E-business practices and tools will lower their overall operations cost, which will enable them to provide lower-cost material to their customers.
- b. online sales lower their sales cost, which can also lead to greater profitability and lower product cost.

Summary

All in all, e-business tools can bring significant efficiencies to the supply chain. The technologies are real and available today. In the long run, these efficiencies will determine new cost bases and prices. The real winners are businesses that take advantage of this new opportunity now and reduce their cost of doing business before everybody else does. In other words, early adopters will enjoy a competitive cost advantage.



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