

SOLUTIONS



By Mike Frichol

Most business people

would agree that e-business is the next evolutionary step for conducting business. And most would also agree that e-business will fundamentally change many established practices and processes for businesses. But there appears to be much less agreement on what the specific opportunities are for each business and what e-business means in practice. Research indicates that manufacturers will be at the epicenter of some of the most significant changes related to e-business. AMR Research projects that manufacturers will have the highest adoption rate of Internet-based business-to-business processes by 2004.

Amidst the hype from vendors, consultants, and other providers of e-business products and services, it sometimes appears that everyone has a solution; although identifying the problem these solutions purport to address is another matter. And more importantly, what does e-business mean for manufacturers?

Let's establish a baseline understanding of e-business. At the most basic level, e-business is the means of performing many business processes electronically across the Internet. The Internet provides unprecedented, pervasive access in a standard browser interface to almost anyone, anywhere, anytime, and at a very low cost. Computer-based systems can facilitate the automation of complex business processes reliably and cost effectively. The combination of the Internet's global accessibility, browser interface, and electronic systems is the primary power of e-business. But the endless possibilities for new ways of doing electronic business have many businesses confused about what is appropriate for them. Does a manufacturer really want to sell its products to consumers using an Amazon.com-type model? Probably not, but it is a possibility for establishing a new sales channel or

There's no business like e-business

And for manufacturers,

there's no time

like the present

reaching new markets. Manufacturers generally fall into the business-to-business (B2B) model: Most business interactions and transactions are done with other businesses, not end consumers.

The first step in selecting e-business initiatives is to review the business objectives from two perspectives: What's wrong with what the company is already doing, and what new opportunities should the company pursue? In reviewing what's wrong, focus on the

So what happened? Are business folk too uninformed or technically naive to make IT solutions work? Of course not. The problem is that they didn't understand what was wrong in the first place. The most common mistakes are trying to replicate manual processes into the new system, customizing the new system to do things the way they have always been done or implementing a sophisticated planning and control system for a disorganized factory environment. The

line. But what about the possibilities? Many times, new technologies create new opportunities that were previously unavailable or unaffordable. In addition, they introduce the means to start thinking outside the box. That is one of the key promises of e-business: new and additional ways of doing business. A business can't just analyze its situation and possibilities within its confined context; it also needs to know about the possibilities and capabilities of e-business solutions.

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obstacles that are preventing the company from achieving its objectives and any other known problems. In reviewing new opportunities, focus on the things that could make a major positive contribution to the success of the business, such as improving product quality, reducing costs, growing revenues, opening new markets, outsourcing certain manufacturing processes, or reducing the concept-to-production life cycle.

Before diving headlong into evaluating e-business technologies and solutions, a company should first establish a good baseline of understanding what really matters for its business and what potential solutions and technologies it should evaluate. One recommendation is to build a personal and company knowledge base related to e-business in a structured manner within the following three dimensions: the business, e-business opportunities, and eliminating constraints.

The remainder of this article will explore these three dimensions of e-business for manufacturers and assist them with building the knowledge base to make informed, strategic decisions.

The business

Many manufacturers have made the common mistake of acquiring the “latest and greatest” information technology to solve what is perceived to be the company's problem. What happens more often than manufacturers and IT vendors would care to admit is that the problem isn't solved. Worse yet, the problem is sometimes exacerbated.

fundamental problem is often ineffective processes in a badly designed factory, not poor customer service levels or excessive costs. By trying to treat the symptoms of customer service and costs, manufacturers often find that technology yields nothing but frustration.

This is why it is essential for manufacturers to understand the current state of their business and what they want to achieve in the next three to five years before applying the e-business balm to make it better. Like all technologies before it, e-business has great potential, but it is no silver bullet. The traditional “SWOT” analysis allows one to analyze a business and see opportunities:

- ◆ **Strengths.** What does the company do well? Are these strengths the core competencies that really matter? What are the competitive advantages and why?
- ◆ **Weaknesses.** What doesn't the company do well? Are these factors important? What should be improved or eliminated and why?
- ◆ **Opportunities.** What competencies does the company have that could extend or enhance its offerings? What market or industry changes or trends could positively impact its business?
- ◆ **Threats.** What competitive or disruptive technology challenges will the company face? What key competencies doesn't it have? What market or industry changes could negatively impact the business?

Knowing what problems the company wants to resolve and what new initiatives it wants to achieve provides an important base-

E-business opportunities

In its most simplistic form, manufacturing encompasses three fundamentals: buying materials, making products, and selling products. Let's explore the major e-business initiatives within each category:

- ◆ **Buying materials** is primarily categorized as e-procurement in the e-business world. Every manufacturing business buys materials in three general categories: office supplies, MRO (maintenance, repair, and operating supplies), and production inventory. A commonly used alternate categorization is to categorize everything as either direct material (part of the produced product) or indirect material (everything else consumed but not part of the product). E-business initiatives in this area have mostly focused on e-procurement — electronic purchasing of standard, cataloged materials — of office and MRO supplies. One benefit of e-procurement is the reduced cost of placing orders. Various studies estimate the price of placing a traditional paper purchase order at \$75 to \$150 versus \$25 or less for e-procurement orders. Other benefits — competitive pricing and order management through aggregation and single point-of-control — are also attractive. E-procurement is efficient, but it doesn't address the materials that are most important to manufacturers: production inventory.

The problem is that e-procurement systems are designed to electronically catalog standard commodities. Every company uses some standard commodity items in its products (fasteners, wire, and resistors, for example),

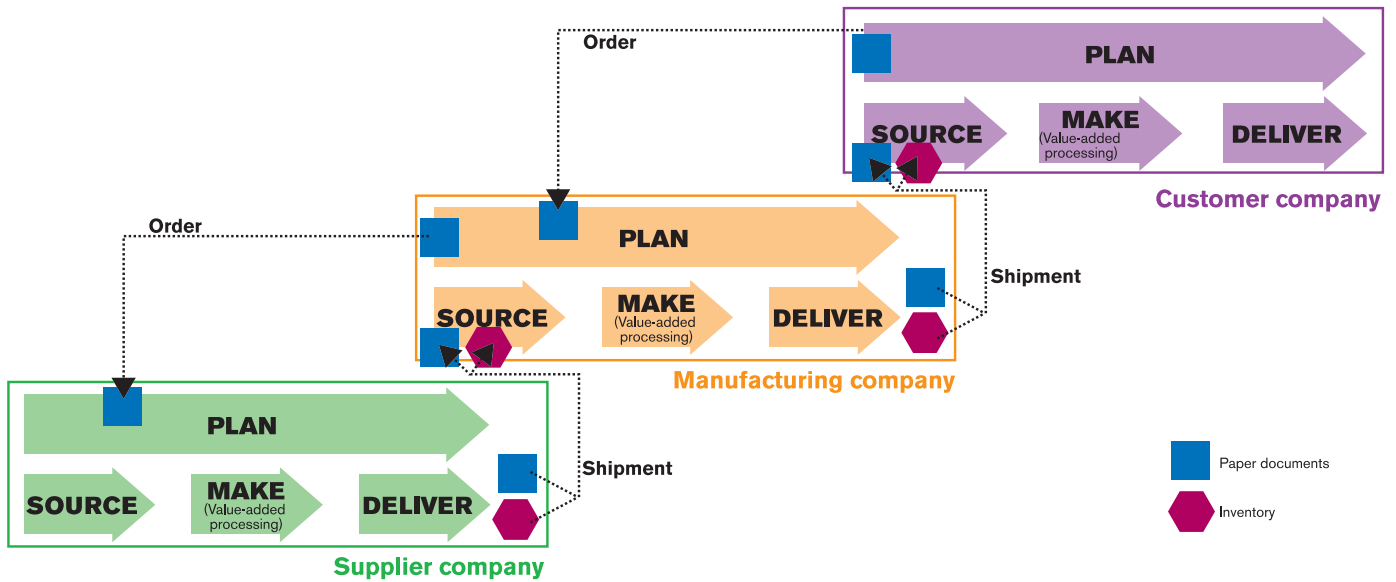


Figure 1. The disconnected supply chain.

but how does it electronically buy aluminum casting of its own design? The problem is that most direct materials need to be custom engineered according to the manufacturer's specifications. Supply chain planning and execution applications help manufacturers communicate electronically with suppliers (and even suppliers' suppliers) to exchange and coordinate demand schedules for production inventory. Think about how inefficiently businesses do things now: A sophisticated ERP system spews out orders or schedules that are input into the supplier's sophisticated ERP system, which in turn Then there's all the paper and just-in-case inventory because circumstances change faster than these disconnected ERP systems can respond. Figure 1 illustrates the problems and limitations of the current approach.

Using e-business supply chain planning as a B2B collaboration hub and the supply chain execution as a B2B trading hub, a company can interconnect all of its trading partners and keep everyone synchronized with each other's current plans while tracking actual activity in real-time across companies (Figure 2).

E-business offers some powerful potential solutions for buying materials but doesn't necessarily address every aspect or solve all problems. (Product design and development, the role of exchanges, and collaborative commerce as part of the process for buying material directly will be discussed later.) Another challenge is product sourcing — finding the supplier that can provide the best quality, price, and service for a company's components. B2B exchanges and marketplaces (which we'll look at later) can significantly

improve a company's ability to get competitive bids and find suppliers.

◆ **Making products.** The most significant change for manufacturers in the latter half of the 20th century was that a manufacturing company didn't do it all. In fact, some manufacturers may do little or no real production. Vertical integration gave way to specialization and outsourcing. Manufacturers design their products cooperatively with suppliers. Production of many of the components or even entire products is done by contract manufacturers, possibly in different parts of the world. A significant implication of this evolving business model for manufacturers is the need to manage and coordinate activities across multiple enterprises beyond the physical boundaries of the factory. Most currently implemented busi-

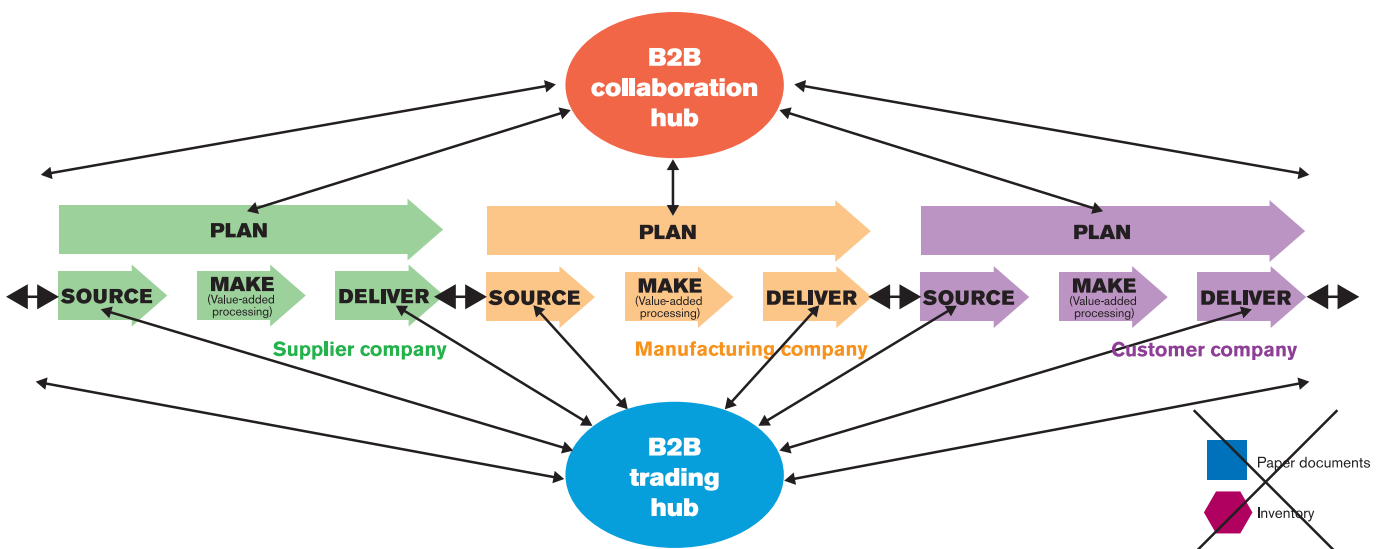


Figure 2. The B2B supply chain.

ness systems and private networks were not designed and do not have the capability to support this model.

The Internet is a natural fit as a backbone to support this global, many-to-many communication and collaborative model. E-business solutions in this area include the previously discussed supply chain B2B collaboration and trading and inter-enterprise process integration within an overall emerging framework generally categorized as collaborative commerce (c-commerce). These B2B solutions offer manufacturers more efficient engineering and production processes with less inventory and improved customer service levels by facilitating collaboration across the entire supply chain.

The only reason companies maintain an inventory of materials is due to uncertainty.

Referring back to Figure 1, the only reason companies maintain an inventory of materials is due to uncertainty. The manufacturer keeps inventory because it is uncertain whether the supplier will be able to supply everything it needs exactly when it is needed, especially when production schedules change. The supplier, in turn, is uncertain whether its manufacturing operation can be responsive to changing demands, so they keep some inventory just in case. Extrapolate this scenario to all of the company's suppliers and their suppliers — each of them is attempting to operate an efficient manufacturing business — and you'll see that everyone is running a business based on uncertainty. What happens when one link in this tenuous supply chain fails? B2B collaborative commerce can help eliminate the uncertainty and keep all participants in a supply chain informed and updated in real time no matter where they are physically located.

◆ **Selling products.** The most prevalent models for selling products in an e-commerce environment is “e-tailing” and online auctions. But as many e-tailers have found out to their detriment, it takes a lot more than a cool online shopping site to be successful. Success requires a responsive electronic, automated fulfillment system. Manufacturers have to sell their products, too; their customers are usually other businesses and they typically sell

through a direct or distribution channel. Manufacturers have to deal with order fulfillment and all the logistics involved in efficiently moving finished product to customers.

E-business systems offer manufacturers many options and potential efficiencies on the sell side of the equation:

◆ **Reaching new markets and customers.** While many manufacturing companies have invested in Web sites, they are basically used as electronic brochures and product information and specification sources. The real e-business opportunity is to participate in B2B markets and exchanges — where business buyers and sellers connect and establish new business relationships. The following hypothetical example illustrates the role of B2B

markets and exchanges: Assume a business wants to determine whether there is a market for high precision aluminum castings in Australia. How would the company normally do this? First, it might send a salesperson there, make contact with a familiar business, and open an office. This process is difficult, expensive, and not scalable to other countries or regions. In the B2B model, the company would join a relevant industry or geographic electronic marketplace or exchange to offer its products to potential buyers. These buyers may already have open bid requests or RFPs for products such as these. The B2B marketplace facilitates connection on a global, many-to-many basis.

◆ **Fulfillment.** Delivering products efficiently and punctually to a variety of global customers is difficult. Some smaller manufacturers avoid global markets because of the complex logistics involved: transportation, import/export regulations, funds transfers, etc. B2B e-fulfillment solutions offer manufacturers a whole new array of easy-to-use services that can do all the fulfillment logistics for them — everything from complete outsourcing to point solutions and services. Specialty services such as truck or container aggregation, import/export permit processing, and reverse logistics are now available for even the smallest companies.

◆ **Order processing.** How easy is it for a

customer to place an order with the company? It may be a lot more cumbersome and difficult than intended. The collaborative supply chain approach enables customers' planning systems to submit and maintain orders and demand schedules directly with its planning system. Individual orders can be entered directly via the Web, using a product configurator to ensure that the correct combination of options are selected — like buying a custom PC from Dell. Sales and support use an electronic customer relationship management application to record and manage all interactions with the customer. No matter where the order originates, it is automatically integrated with the ERP system's production plan and schedule. And because everyone has access to every interaction with each customer contact, customer service levels and satisfaction ratings improve dramatically.

Eliminating constraints

This is the third dimension of knowledge to acquire and consider for an e-business initiative. While a company should determine whether and how it applies to its business, it should also explore the potential opportunities presented by e-business solutions to the four constraints that apply to most manufacturers:

◆ **Traditional B2B trading is restricted and controlled by the mega-corporations.** This is not a slight against the mega-corporations; it's a consequence of how they, in good faith, have implemented their own proprietary e-business systems. Any manufacturer who has been a supplier to the Big Three automakers or mega-retailers understands how it works. The mega-corporation dictates how suppliers will deal with them, including EDI transactions via a proprietary or value-added network. As illustrated in Figure 3, the buyer controls the activities and interactions with suppliers.

With the advent of the Internet and World Wide Web, many companies recognized the opportunity to reach more buyers by establishing a Web site to publicize their products and services. This has limited success because while the Web is an easy and relatively cheap tool for disseminating information, the number of sites and the inadequacy of search engines make it difficult to reach new customers. For some companies, the basic Web site evolved (Figure 4) into an e-commerce site for selling products on the Web, again with limited success. Dot-coms fizzled when

faced with the hard realities of doing real business over the Internet. Some, like Cisco and Dell, leveraged the e-commerce model and prospered, but for most manufacturers, e-commerce didn't deliver much. With this model, however, an important fundamental shift of control occurred from the buyer to the seller.

The next progression in B2B trading evolution is to interconnect buyers and suppliers in an open, unbiased trading model. This interconnection will allow suppliers and buyers to trade seamlessly with one another in a many-to-many model while maintaining control over their specific trading practices and their domain. This many-to-many, open interconnection is facilitated by a variety of private or public marketplaces and exchanges. For example, the Big Three automakers have launched Covisint as a global marketplace and trade exchange for all buyer and supplier B2B interactions with those companies. Figure 5 illustrates how B2B trading hubs (marketplaces or exchanges) provide an efficient business model that essentially levels the playing field for all buyers and suppliers.

◆ Most current business systems are intra-enterprise focused: traditional MRPII and ERP systems implemented by many manufacturers were designed to automate the business processes within the organizational four walls of the company. These intra-enterprise systems were initially concentrated around so-called back-office applications such as accounting, inventory, MRP, and purchasing, as indicated in Figure 6.

Within the past five years, companies have been implementing front-office systems such as sales force automation and customer relationship management. Although the focus of front-office applications is on customers outside the company, the associated business processes and organizational automation are still intra-enterprise. B2B e-business represents a fundamental shift to inter-enterprise systems focused on facilitating interconnection and virtual integration between separate, independent companies that transact business with each other. While B2B promises significant benefits and process improvements, it also presents a whole new set of challenges, as indicated by the comparative bullet points in Figure 6. An interesting observation is the changing value proposition: Cost savings motivated most ERP and MRPII implementations, customer service and reten-

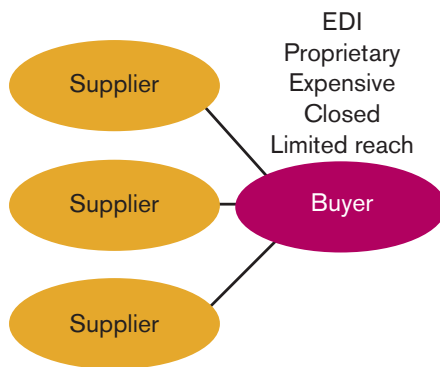


Figure 3. Buyer-controlled B2B.

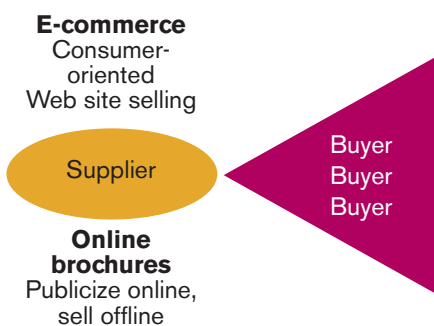


Figure 4. Seller-controlled e-commerce.

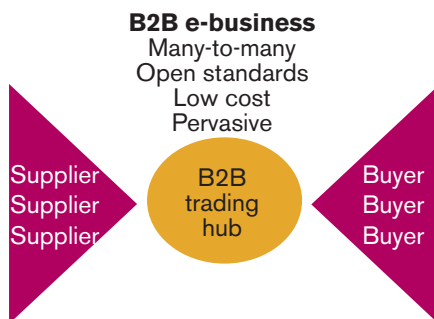


Figure 5. B2B marketplaces and exchanges.

tion motivated CRM implementations; business growth or even survival motivates B2B implementations. That doesn't mean there aren't significant efficiency gains and cost savings potential with B2B systems but that a company should motivate its B2B initiative based on business growth objectives.

◆ Interactions between businesses are complex, labor intensive, and not scalable. Manufacturing is a complex business with many interactions between many internal and external contributors. Coordinating all these players and activities is a challenge under the best circumstances. The current reality is far from sedate due to the increasing pace of change, significantly shorter product life cycles, increasing customer demands for decreasing delivery lead times, enhancing product sophistication, and growing global competitive pressures. And there's the growing trend for on-demand mass customization of product — manufacture just what the customer wants when he or she wants it. The traditional “make some, sell some” model is being dominated by the new model of “sell one, make one.” All of this change leads to the need for more responsiveness and the need for better coordination of all the interactions and activities among all participants in the supply chain.

As Figure 7 illustrates, the traditional model is too labor intensive and expensive to scale up and is generally slow and cumbersome. In comparison, the B2B collaborative model facilitates many-to-many electronic interactions between all trading partners, anywhere, anytime.

◆ Commerce is fragmented by geography. This is also known as spatial market fragmentation. The premise is that businesses are generally constrained to trading partners

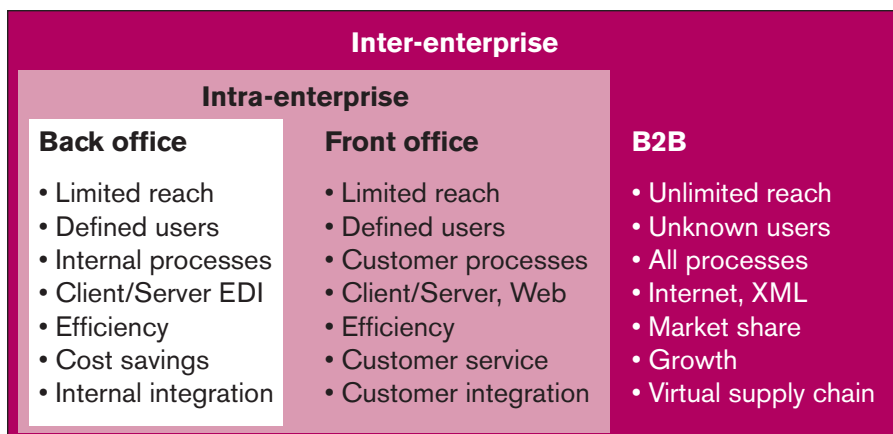


Figure 6. Most current business systems focus on automating processes within their organization.

within their geographic area. It also holds that the smaller the business, the smaller its geographic reach for trading partners. For example, think of a small manufacturer in Peoria, Ill. It just designed a new product that requires a set of precision helical gears that need to be sourced from a supplier. Assuming the manufacturer has no existing supplier relationships for this type of item, how does it find a supplier that can deliver at the quality, quantity, time, and price needed? Suppose the manufacturer finds a reasonably good supplier in Chicago, and life goes on. But what about that company in Italy? How could it ever find the best supplier for this item and then connect to do business? B2B marketplaces and exchanges make this possible by providing a pervasive, global collaborative community of buyers and sellers.

There are many aspects to the B2B e-business proposition. There is no doubt that some of the technologies and solutions are still immature, but the pace of progress is accelerating every day. Eventually, all the pieces will assemble under the umbrella of collaborative commerce and no single vendor or service provider will offer the complete solution. C-commerce itself will be a collaboration of vendors and service providers, including ERP, CRM, product data management, CAD/CAM, supply chain, B2B hubs, ASPs, hardware, software, networking and many other technologies. This trend toward

multi-vendor collaboration to deliver e-commerce solutions is underway, as evidenced by the growing number of daily press releases announcing a myriad of business partnerships, relationships, and technology alliances.

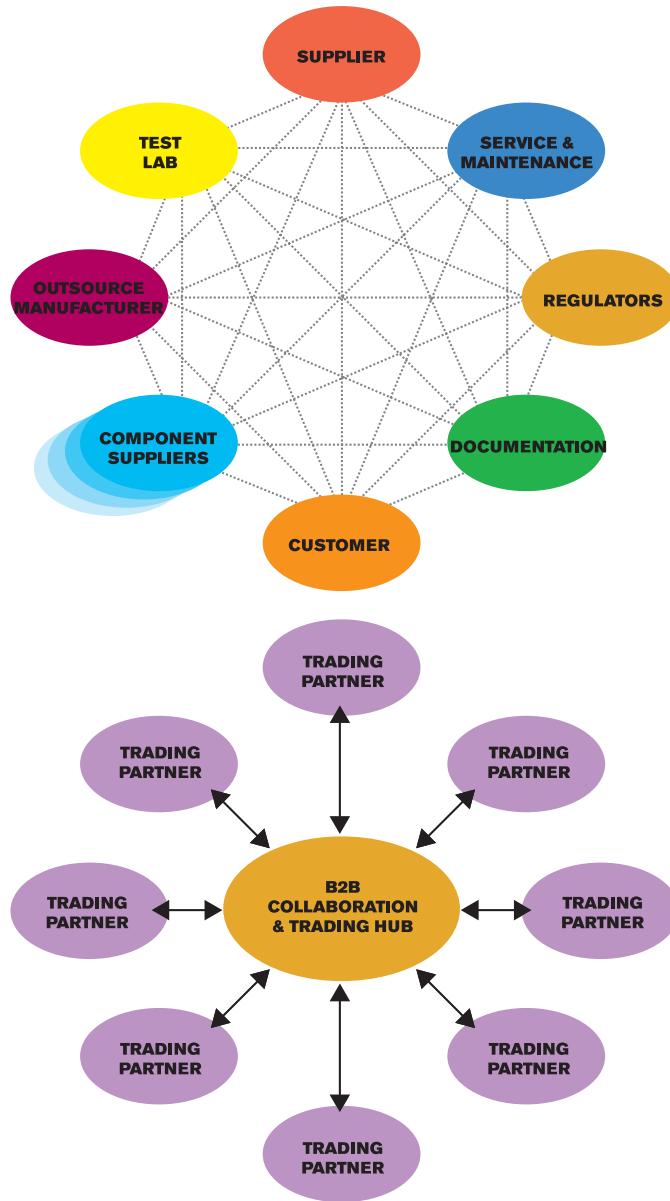


Figure 7. Traditional vs. B2B interaction.

E-business offers unprecedented opportunities to grow a business and greatly improve its manufacturing operation in ways that were previously unaffordable or unavailable. For some, it might mean the difference between surviving and flourishing versus being trampled into oblivion by a disruptive technology or competitor from who-knows-where. The opportunities for manufacturers to leverage e-business to propel their business is enormous. A company should perform its due diligence in planning, knowledge acquisition, and understanding with an overall vision for the business benefits and its priorities. Don't wait for all the pieces to fall into place. It's time start a B2B e-business initiative. ♦

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