INCUMBENTS TAKE THE INITIATIVE
HARNESSING THE POWER OF BUSINESS-TO-BUSINESS E-COMMERCE IN EUROPE
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INCUMBENTS TAKE THE INITIATIVE
HARNESSING THE POWER OF BUSINESS-TO-BUSINESS E-COMMERCE IN EUROPE

MAY 2001

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**METHODOLOGY**
Many European companies are now revisiting their investments in and strategies for business-to-business e-commerce. Their desire to reassess their online activities makes eminent sense. The early results of online initiatives in a broad array of areas—including procurement, sales, customer relationship management, supply chain management, and collaborative design—are mixed. On the one hand, some companies are starting to generate real benefits. On the other, virtually all companies have found the going to be a lot tougher than they had anticipated, and a sobering shakeout among online marketplaces is now under way.

To rethink their approaches, companies need to understand how business-to-business e-commerce is evolving. To that end, The Boston Consulting Group conducted its first pan-European review of the strategies, benefits, and lessons learned in this realm. This is the latest in a series of BCG reports on business-to-business e-commerce, which includes Racing Season: B2B E-Commerce in Germany; Arming for E-Combat in Asia Pacific: The New Rules of Engagement; After the Land Grab: B2B E-Commerce in Australia and New Zealand; and The Business-to-Business Opportunity: Creating Advantage Through E-Markets, a review of the state of play in the United States. These reports are part of BCG’s global research on e-commerce and its impact on business.

This report relies on quantitative and qualitative research conducted between December 2000 and February 2001. The purpose of the research was to measure the penetration of Internet-based business; to assess the nature and level of benefits that have been achieved; and to discover the activities that companies plan to pursue over the next few years. We surveyed buyers, sellers, and supply chain managers at more than 2,300 companies in Belgium, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, and the United Kingdom. We also conducted in-depth interviews with over 200 managers at large corporations and e-marketplaces. Finally, we drew on our experience in more than 100 assignments for European clients over the last two years.

We would like to thank the many companies that have shared their experiences with us. Our special thanks go to the BCG project team, led by Dagmar Klinz. It included Anthony Datel, Gerry Hill, Elisabeth Kalman-Sarkis, Jonas Lagerstedt, Chris Mark, Petr Nosek, Marc Pfitzer, Steve Prokesch, José Luis Ruiz, Paolo Sammarco, Markus Seidler-Huehn, Sharon Slotki, and Pekka Vanne. We would also like to thank the BCG officers who led local research teams or contributed to the report in other ways: James Andrew (Chicago),
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We welcome your feedback. For inquiries about BCG’s e-commerce services, please contact the authors. If you have any questions about this report, please send an e-mail to b2beurope@bcg.com.
Business-to-business e-commerce is rapidly moving from potential to reality in Europe. Major corporations are mobilizing to build capabilities for buying and selling goods and services over the Internet. In doing so, they are laying the foundations for online activities that will have an immense impact on Europe’s competitive landscape. The online procurement and sales platforms being built today will expand dramatically and will ultimately allow companies to conduct a broad range of activities online. They will enable companies to manage their supply chains much more effectively; to expand their ability to collaborate with each other in developing new products; to offer enhanced services such as build-to-order; to outsource noncore activities on a much larger scale; to share costs with competitors; and to customize and differentiate their offerings. As the leaders build these new capabilities, they will change the balance of power in many fields of competition.

Most of the winners will be successful offline businesses that have understood the potential of e-commerce and worked persistently to realize its benefits. As they migrate online, some companies will seize the opportunity to significantly improve their competitive positions. Others, which either fail to see the opportunities or fall short in implementing their online strategies, will suffer a permanent erosion in their competitive positions.

A relatively small number of e-marketplaces will help companies make the transition. The majority will be backed by industry consortia and will operate like utilities. Leading corporations will depend on them for nonstrategic functions or services and will build important differentiating capabilities on their own private sites.

EXECUTIVE SUMMARY

But this scenario will take some time to materialize. Realizing the full potential of business-to-business e-commerce will take many years. Progress will come in fits and starts and will require a concerted effort by a broad range of industry players.

Today a tremendous amount of uncertainty remains. Many corporate leaders are reassessing their online business-to-business initiatives, and for good reason. Of the thousands of projects launched in Europe in 1999 and 2000, the vast majority are consuming more resources and taking longer to develop than expected—and only a handful have generated clear-cut gains in competitive advantage. Visions of windfalls from Internet-related initial public offerings (IPOs) have evaporated, and perceived threats from dot-com start-ups have disappeared.

Executives should not be disheartened by the slow progress. Instead of focusing on the disruptions and high costs of the early initiatives, they should view them as building blocks for the dozens of initiatives ahead. Their cumulative experience will make the process less painful, and the rate at which benefits are generated will accelerate—especially once a critical mass of companies is onboard.

Some important changes have occurred already. Spurred on by the threats and opportunities of e-commerce, traditional companies have accelerated some of their decision-making and resource-allocation processes. They have begun to work with competitors in ways that would have been unthink-
able a few years ago. Although there have been no fundamental or sweeping changes yet in the power structures of most industries, there are a growing number of isolated cases in which companies achieved impressive—even startling—results by applying online technologies to such activities as procurement, sales, supply chain management, and product development.

However, many companies still do not have a clear road map. They have no framework for prioritizing their investments, determining how fast they should go, measuring the performance of their internal and external investments, and deciding which online activities to keep private and how and when to participate in consortia or public e-marketplaces. Yet there is a pressing need for companies to create such frameworks—to formulate and implement robust strategies for gaining competitive advantage. Yes, many dot-coms became “dot-bombs” and are no longer potential threats. But the next battle, which will be waged among incumbents, is already under way.

Incumbents that embrace the opportunities and master them will gain a significant advantage over those that delay. But many executives worry that there is too much uncertainty to create robust strategies. From our research, we have discerned six major opportunities to gain traction in the effort to build advantage by exploiting e-commerce.

**Focus on creating sustainable advantage.** A great deal of activity today involves online procurement, but the greatest sources of competitive advantage are often found elsewhere. Because the potential cost savings from online procurement are too big to pass up, every company needs to get into the game—both to achieve those savings and to remain competitive. For a company to derive long-term advantage from online procurement, however, it will have to overcome the formidable challenge of continually staying at least one step ahead of the competition. For most companies, this is not a viable strategy. Their best bet is to approach online procurement as a platform on which to build capabilities in areas such as supply chain management and product development, which can provide sustainable advantage.

**Use the Internet to expand the breadth and depth of the target market, not just the depth of existing relationships.** Although online sales promise significant opportunities to expand the number of customers that a company reaches, few companies investing in these initiatives have used them yet to broaden their customer bases. Most have focused on using the Internet to improve the richness of their offerings to existing customers. Such initiatives will increase loyalty and help companies learn how to sell effectively over the Web. However, in order to mitigate the fixed cost of online sales platforms, companies will also need to win new customers. The companies that use the Internet to increase both the richness of their offerings and the number of customers they reach will extract the most value from online sales initiatives. This approach can generate sustainable competitive advantage.

**Align technology investments with the business strategy.** All companies agree that business priori-
ties should determine the e-commerce agenda, but in reality many are investing in the IT solutions that are most readily available. Although it is widely recognized that Internet technologies can make new business strategies possible, business leaders must set the agenda on the basis of what will create competitive advantage, not on the basis of technology solutions. We have found that companies that take a thorough bottom-up approach to opportunity assessment have the best perspective on where value lies. And it is increasingly clear that packaged software solutions pushed by IT vendors are often inappropriate for realizing the greatest potential.

Begin investing now in the challenging areas with a longer-term payoff. Using the Internet to manage supply chains and product development more effectively can create significant advantage. Because the near-term returns on investments in online procurement and sales initiatives are more certain, however, those efforts are getting the majority of management’s attention at most companies. Yes, online collaboration in supply chains and product development requires more substantial investment and more time, which makes initiatives in this area more risky. But this means there is an opportunity for the bold companies that focus on these activities now and figure out how to make them work. The experience these companies accumulate will be a source of competitive advantage in the future.

Leverage public e-marketplaces to create private sources of advantage. Public e-marketplaces—online exchanges that link many buyers and sellers—will be available to everyone. As such, they will not by themselves generate advantage for individual companies. Advantage will come from the proprietary capabilities that individual companies build on the back of or alongside these public platforms. This explains why a growing number of companies are pursuing hybrid strategies. They are looking to public exchanges to define standards, share the risk of building costly infrastructure, and provide basic functionality. But they are building private sites to maintain their control over strategic relationships and functions. Companies that expected to depend almost exclusively on public e-marketplaces should reevaluate their original reasons for participating in these consortia.

Gear up to tackle immense internal change. Many companies are preoccupied with how e-commerce is altering or might alter their interactions with other companies. But internal transformation is the key to realizing the promise of business-to-business e-commerce. To capitalize fully on e-commerce, companies will have to revamp operating processes, standards, roles and responsibilities, and individual employees’ behavior. Such changes are a prerequisite for the different companies in a supply chain to be able to operate as if they were one. Therefore, companies must simultaneously look externally and internally when assessing and prioritizing their e-commerce initiatives. They must understand the full dimensions of the internal change that an initiative will require and what it will take to implement that change.
Developing a robust strategy for business-to-business e-commerce requires an understanding not only of how and at what rate it is evolving but also of its potential to create advantage. It is all too easy to inflate the importance of what is happening today and postpone thinking about developments that will not fully take root until tomorrow. Many European companies could fall into the trap of focusing excessively on the most widespread current activities in business-to-business e-commerce: procurement and sales. Some may even make the dangerous mistake of overestimating the potential of these online activities—especially procurement—to yield sustainable advantage.

These companies should be viewing online procurement and sales as the foundation for more sophisticated functions—ones that support activities such as online supply-chain management and online product development, which can generate powerful advantages. These companies should be aggressively seeking opportunities to steal a march on their competitors by being pioneers in those activities.

The evidence that e-commerce will continue to grow dramatically should give companies the courage to act boldly. The Boston Consulting Group expects the total volume of online transactions in Europe to jump from €200 billion in 2000 to €3.1 trillion in 2004. (See Exhibit 1.) By then, about 21 percent of all commerce between European companies will be conducted over the Internet. Europe will also narrow the current gap with the United States. The level of penetration—or the portion of business-to-business transactions...
conducted online—in Europe today is less than one-third that in the United States, but we expect Europe to gain substantial ground relative to the United States by 2004. (See Exhibit 2.) The amount of online purchasing will soar in all countries and industries, propelling e-commerce to significant levels. (See Exhibits 3 and 4.)

This growth makes a strategic perspective vitally important. Rather than implementing the technical solution of the day and allowing IT vendors to drive their e-commerce agendas, companies should set their business goals for e-commerce and focus religiously on a step-by-step approach to achieving them. Value creation should be the driving force.

EXHIBIT 2

**EUROPE IS CLOSING THE GAP**

<table>
<thead>
<tr>
<th>Online purchasing as a percentage of business-to-business purchasing</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image-url" alt="Graph" /></td>
</tr>
</tbody>
</table>

**Sources:** Eurostat, national statistics offices of Norway and the Eastern European countries, Swiss Federal Institute of Technology, Prognos, BCG survey of 1,033 procurement managers, BCG analysis.

**Notes:** Gross purchases count each purchase along the supply chain, not just the net value added. The European countries in our survey were Belgium, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, and the United Kingdom.

1. The penetration rate for 2000 is less than 1 percent.
2. The Nordic countries are Denmark, Finland, Norway, and Sweden.
3. The penetration rate is for large corporations.

**EXHIBIT 3**

**ONLINE PenetRATION W I L L RISE SIGNIFICANTLY IN ALL COUNTRIES . . .**

<table>
<thead>
<tr>
<th>Countries or regions</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>5%</td>
<td>28%</td>
</tr>
<tr>
<td>Germany</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>France</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Italy</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Nordic countries</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Iberia</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Belgium/the Netherlands</td>
<td>10%</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Sources:** Eurostat, national statistics offices of Norway and the Eastern European countries, Swiss Federal Institute of Technology, Prognos, BCG survey of 1,033 procurement managers, BCG analysis.

**Notes:** Gross purchases count each purchase along the supply chain, not just the net value added. The European countries in our survey were Belgium, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, and the United Kingdom.

**GETTING STARTED WITH ONLINE PROCUREMENT**

Many European companies are focusing first on online procurement for several understandable reasons. For one, IT solutions appear to be readily available. (IT vendors are certainly promoting them heavily.) For another, companies find that they can employ these technologies to realize cost savings quickly by pooling purchases and lowering transaction costs.
Most companies get started with indirect goods such as supplies for maintenance, repair, and operations (MRO). This category of products is non-strategic in nature, so it is a relatively safe place to experiment with new technologies and processes. The widespread existence of common electronic standards for describing these goods (because such a broad spectrum of industries buy the same basic products) and the highly fragmented nature of the industries that supply them also make them a natural starting place for online procurement.

The way in which Pirelli, the Italian manufacturer of tires and cables, has approached online procurement is typical. It has 70 production sites spread across 16 countries, and sales and customer support offices in 120 countries. Last year the company decided to begin with indirect goods for several reasons. Its supplier base was extremely fragmented and localized; indirect goods accounted for a significant portion (approximately 25 percent) of its total procurement expenditures; indirect supplies were not strategically important; and, last but not least, the initiative would help lower the costs of all—not just some—of Pirelli’s factories. The platform currently supports more than €1 million per week in transactions at six plants, and the company estimates that it has an eight-month lead on competitors.

In the long run, however, online procurement of direct goods—that is, goods used to make a company’s products—will prove more important. One reason is that they account for the majority of companies’ procurement spending. But a more important reason is that such a system can serve as a platform for other online services or activities. Specifically, building the technical and process infrastructure for direct goods will facilitate the development of online supply-chain management, a potentially powerful competitive weapon.1

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1. Because off-the-shelf IT systems for purchasing direct goods are often not appropriate, companies must customize the technology, and they tend to do that in close cooperation with suppliers. Thus, such efforts become a first step toward online supply-chain management.
In the meantime, many companies are finding it harder to reap the benefits of online procurement than they had anticipated. Indeed, only about 20 percent of the companies we surveyed have realized shorter lead-times, lower transaction-processing costs, or lower prices for indirect goods. And the percentages of companies reporting benefits for direct goods are generally lower than for indirect goods. (See Exhibit 5.) We have found that capturing the potential cost savings requires companies to overcome a number of hurdles.

Purchasing processes must be redesigned. This means that people in procurement will lose some freedom—and possibly their jobs. Embedding purchasing guidelines in online platforms may enable companies to do two things. One is to move buying decisions out of the purchasing department and give them to either the end users of the goods or someone closer to them than the purchasing department. Another is to give responsibility for negotiating and managing a much larger portion of supply contracts to a central organization.

An IT platform must be created. Such a platform is often much more difficult and time-consuming to

ERICSSON: SLASHING ADMINISTRATIVE COSTS

When Ericsson, a Swedish manufacturer of telecommunications equipment, recently analyzed its processes for purchasing indirect goods, it found substantial room for improvement. Its supplier base was highly fragmented, which indicated that the company was not effectively utilizing its purchasing clout and that record keeping had become a nightmare. Less than half of Ericsson’s invoices had an identifiable owner, and the company’s purchasing department wasted considerable time and effort trying to track down the right person for verification.

To address those problems, Ericsson developed an online procurement platform with the potential to slash administrative costs by up to 80 percent. This estimate assumes that everyone in the company will use the new system. Indeed, although the platform has obvious benefits, Ericsson faces an uphill battle getting the organization to adopt it en masse, since the technology requires employees to discard old habits and traditional purchasing processes. To overcome these hurdles, the company is demonstrating the system’s user-friendliness and convenience, as well as its ability to guarantee the best rates and compliance with corporate buying policies. At the same time, Ericsson is telling suppliers that it will not guarantee invoices generated outside the system.

Recognizing the utility of the platform and the possibility of sharing some of its costs, Ericsson opened up parts of it to other companies in October 2000. It formed the IBX Integrated Business Exchange, an electronic marketplace for indirect goods, together with Groupe SEB and other partners.

EXHIBIT 5
RELATIVELY FEW COMPANIES HAVE BENEFITED FROM ONLINE PROCUREMENT SO FAR

<table>
<thead>
<tr>
<th>Percentage of respondents who have realized benefits</th>
<th>Indirect goods</th>
<th>Direct goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorter lead-times</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Lower transaction-processing costs</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Lower inventory costs</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Lower prices</td>
<td>20</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: BCG survey of 1,033 procurement managers.
Note: The respondents were the 452 procurement managers in the survey group who used the Internet for purchasing. The respondents to the separate questions about indirect goods and direct goods were different subsets of the 452 procurement managers.
implement than many companies realize. Both buyers and sellers must agree on the IT system, as well as on product and transaction standards. In addition, contrary to the promises of some software vendors, almost all companies encounter unexpected problems integrating online procurement applications with legacy systems. Another challenge is that building and maintaining up-to-date online product catalogs can be harder than envisioned. In many instances, the costs and risks of building an IT platform are so high that companies should consider joining forces and forming an e-marketplace to tackle the challenge.

The corporate culture must be transformed. This entails breaking down territorial empires and persuading buyers to comply with companywide purchasing policies. The latter requires devising new ways to monitor purchasing activity and offering incentives that promote compliance.

NYLSTAR: LAYING A FOUNDATION FOR ONLINE PROCUREMENT AND SALES

To maximize the potential value of e-commerce, companies often have to make significant organizational and process changes. Nylstar is one company that made many of those changes in advance. As a result, its transition to an online procurement platform has been swift and relatively painless, and the payoff has been sizable.

The Italian company is the leading European manufacturer of nylon yarn for the textile industry. It generates sales of €600 million (€679 million) annually, with nine production sites in Europe and one in the United States. In 1996, well before the advent of business-to-business e-commerce, the company launched a sweeping overhaul of its organization and operations in an effort to rationalize its complex production structure and improve its profitability through greater cost-effectiveness. It also redesigned its supply chain and related processes, replacing them with an order-to-delivery logistics platform based on software from Germany’s SAP.

The result was a considerable reduction in inventory, transportation, and warehousing costs; an improvement in overall response time; and a general improvement in workforce efficiency. Nylstar then undertook a companywide reorganization, which yielded further substantial gains in efficiency by consolidating the company’s main functional support areas. Nylstar emerged from these labors far leaner, more productive, and more cost-effective.

In the beginning of 1999, however, the company saw further room for improvement, particularly in sales. Nylstar has a highly fragmented customer base, which consists of thousands of end users and several agencies that act as intermediaries. These customers generate thousands of orders per month and buy everything from yarn to finished products, such as knitted or woven fabrics. Nylstar believed the Internet offered it an opportunity to further rationalize its order handling and back-office operations, reduce transaction and agency costs by reaching customers directly, and deepen its relationships with customers by offering full visibility through the entire order-to-delivery cycle. Accordingly, it invested in an online sales platform.

Despite some initial resistance from customers, the results have been striking. In 2000, 34 percent of the company’s revenues were generated and processed through the Web, and Nylstar used the Web to track business accounting for an additional 20 percent of revenues that originated in traditional channels. The company predicts that the share of its businesses generated and processed through the Web will rise to 60 percent of revenues this year.

The online sales platform has produced other benefits as well, including a 10 percent drop in back-office costs (and the company anticipates that by letting it cut out middlemen, the Internet-based system will allow it to slash intermediation costs by 40 percent this year); a boost in sales-force effectiveness (freed from order-management duties, sales personnel can now focus on activities that generate more revenues); and stronger relationships with customers.

Had Nylstar not successfully laid the groundwork in advance, its executives say, the company could not possibly have gone so far so fast.
Even though online procurement is still in the early stages and few companies have surmounted all the challenges, some are already enjoying significant gains. Those companies that have benefited from online procurement reported in our survey that their lead-times had shrunk by about 30 percent on average and their transaction-processing costs had fallen by around 25 percent. In addition, online buyers reported substantial price reductions—an average of 8 percent for direct goods and 13 percent for indirect goods. (See Exhibit 6.)

Companies will continue to exact lower prices by using online procurement systems to limit maverick buying and obtain volume discounts. The magnitude of the price reductions in general, however, is likely to decrease over the long term. For instance, the deep price reductions that auctions are currently wringing from suppliers may be deceptive. As auction volumes build up and suppliers gain more experience, they will increasingly need to seek sustainable business. As a result, they may bid less aggressively. Furthermore, buyers will be selective about which supplies they put up for auction. They will realize that other considerations—including quality, dependability, and the willingness of a supplier to satisfy extraordinary demands—may matter more than price.

In the long run, the most lasting impact of online procurement is unlikely to be lower prices. Its greatest value may ultimately come from providing a platform for other capabilities that can generate sustainable competitive advantage, and from serving as a proving ground for the massive organizational changes that lie ahead.

**BUILDING ONLINE SALES AND SERVICES**

Moving sales and services online presents an opportunity not only to cut costs but also to boost customer loyalty and revenues. It offers a chance to create a stronger competitive advantage than online procurement does.

Seeking to improve the offering for current customers is a logical first step for many companies. Existing relationships are a source of competitive advantage, and the higher-value services that the Internet makes possible can increase efficiency, loyalty, and sales. Moreover, today’s initiatives with existing customers will give incumbents insights into how to serve and sell to new ones over the Web. Indeed, this undoubtedly explains why most of the companies we surveyed expect online sales channels to enable them to increase revenues by 2004. (See Exhibit 7.)

Companies have responded quickly to the opportunities the Internet offers in sales and services. Approximately one-third of the suppliers we interviewed have used the Internet to differentiate or improve their products and services. These companies are pursuing several tactics.
Offering new higher-value services. A European provider of industrial services says it has increased customer satisfaction and retention by offering online contract management. The system gives customers and field agents access to detailed information about which services are being performed, when, and at what cost. In addition, field operators serving customers with multiple sites now use mobile devices to retrieve contract information while on location. (For a discussion of other wireless applications, see the insert “Wireless Applications in Business-to-Business E-Commerce.”)

Serving smaller customers more cost-effectively. The Swiss transportation firm Danzas has bundled a broad set of Web-based services that allow small and midsize customers to perform functions that had been available only to big customers. They include online booking, tracking, and invoicing for air,

### Exhibit 7
More Companies Expect Online Sales to Boost Revenues Than to Cut Costs

<table>
<thead>
<tr>
<th>Percentage of respondents who have realized or expect to realize benefits</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in total revenues</td>
<td>21%</td>
<td>56%</td>
</tr>
<tr>
<td>Reduction in total costs</td>
<td>12%</td>
<td>38%</td>
</tr>
</tbody>
</table>

Source: BCG survey of 1,103 sales managers.

Note: The percentages for 2000 are based on responses from 544 sales managers who are already using the Internet; the percentages for 2004 are based on responses from 923 sales managers who either are already using the Internet or plan to use it by 2004.
ocean, and ground transport around the world. Danzas had begun using EDI networks in the early 1990s to communicate with its largest customers. But it couldn’t establish cost-effective electronic connections with the small and midsize enterprises that made up 80 percent of its customer base. The company’s Internet initiative is changing that. Although the system has been rolled out to only three countries, it is already generating 4,000 to 5,000 orders per day. Danzas also reports cost savings of about 30 percent in order processing.

Targeting previously underserved customer segments. The Danish brewer Carlsberg now allows kiosks, restaurant chains, and gas stations to use their own computers to place orders over the Internet. Its system provides access to order histories, customers’ standard orders, suggested alternative orders, and promotional product offers. Carlsberg, which has its own distribution system, guarantees both the day of delivery and the mix of ordered products when customers place their orders online. The company handles approximately 750,000 orders annually from about 18,000 customers, and it expects its online system to generate savings of around Dkr 20 to Dkr 25 (€2.7 to €3.3) per order and a significant increase in customer satisfaction and loyalty.

Establishing direct connections with customers. In 1999, France Télévision Publicité (FTP), the advertising division of the public networks France 2 and France 3, launched MediaExchange, the first Web site dedicated to selling TV advertising. MediaExchange is trying to radically alter the rules of its industry by running Dutch auctions and creating secondary markets for TV advertising. The Web site allows advertisers to buy or sell slots up to

Even after a purchase order is placed online, much of the financial, administrative, and logistical work involved in the transaction must still be conducted offline. Several groups are working to remove that bottleneck, including Isabel, a consortium of Belgian banks. Isabel was created in the mid-1990s to provide an infrastructure for secure electronic banking services in the Belgian bank-to-business market. Its system handles the full spectrum of banking services—including money transfers and providing access to balances in several banks—and is currently used by 25 banks and 45,000 companies in Belgium and other countries. The consortium believes it can leverage its existing technology and customer base to expand into the broader business-to-business market. Isabel still faces some considerable challenges and threats. One challenge is winning the acceptance of major corporations. One threat is that an international solution may emerge that will quickly become the standard and draw away the group’s biggest customers. Finally, Isabel could face competition from technology players, such as Sun Microsystems, Microsoft, and IBM, and most large financial institutions.

ISABEL: TAKING THE FINANCIAL WORKFLOW ONLINE

However, there are reasons to believe Isabel can succeed. The group has already developed an identity certification protocol that can authenticate transactions between two corporations; it is based on the hardware and software that Isabel developed for its bank-to-business platform. This protocol gives the consortium a substantial leg up because identity verification is a prerequisite for business-to-business e-commerce and Isabel is an established player with an excellent reputation. But Isabel aspires to offer much more than secure online transactions between companies. Its ultimate goal is to cover all the financial activities needed to support business-to-business e-commerce. To that end, it has developed an electronic invoicing system, which has already been recognized by the Belgian ministry of finance. And to facilitate broad acceptance of the system, Isabel has developed “middleware” that will integrate the system with the main ERP (enterprise resource planning) software and hardware packages common in larger companies, as well as with the accounting packages used by smaller companies.
Metso, one of the world’s leading suppliers of processes, machinery, and systems for the pulp and paper industry, has created a remote diagnostic platform that has substantially improved the efficiency of its customers’ machines. The Finnish company believes that the platform, now in the pilot stage, will strengthen its competitive position and deepen its relationships with customers.

Metso has developed a means of linking its customers’ IT systems for operating, maintenance, quality control, and production planning to its remote diagnostic center. There, a group of Metso experts can monitor the machines in real time and make recommendations on how to run and maintain them optimally.

The significant benefits for customers include an increase of 2 to 3 percent in production capacity and a halving of maintenance costs. Currently, only a few machines in Finland are linked to the platform. However, Metso hopes to extend it to tens, if not hundreds, of machines in the next few years.

The company is also thinking about using the platform to offer more advanced services and create new business models. For example, Metso could take a more active role in running and maintaining the machines. Eventually, paper producers even might decide to focus solely on marketing and distribution, and allow third-party investors to own the machines and Metso to operate them.
by compensating them for online sales or by limiting the online channel to certain products and services or to certain customers.

Begin to use the Internet to become an effective attacker and defender. Companies should move quickly to use online offerings that have been a hit with current customers to win others in the same segments in new regions. Similarly, they should leverage the power of the Internet aggressively to serve previously hard-to-reach segments in a cost-effective fashion. Finally, they should devise strategies for using public online exchanges to invade new segments or regions, and for building proprietary capabilities on private sites in order to secure valuable relationships.

Some companies have already reaped significant gains from online procurement, sales, and services. For those that have hesitated to take the plunge, the message is clear: they had better move quickly or they could soon find themselves with an uncompetitive cost structure and an eroding customer base. For companies that are leaders, the challenge is to keep pushing forward.

For many companies, any advantages gained will be fleeting. Competition will quickly make it difficult to hold on to them. So buyers should think twice about using online procurement merely to squeeze suppliers, and sellers should not be content with employing such systems to increase the loyalty of their current customers. Both groups should be thinking much more expansively about how to leverage what they have learned and built in order to collaborate with suppliers, customers, and even competitors to manage the supply chain and develop products. They should be scrutinizing every step in the value chain to discover the places where they can change the basis of competition to their advantage.

Electrocomponents is a leading distributor of electronic, electrical, and mechanical components, with almost £1 billion, or nearly €1.6 billion, in annual sales. The U.K.-based company offers more than 300,000 products to over 1.5 million customers in 160 countries. Until recently, its business model has been relatively straightforward: twice a year, it has distributed a comprehensive catalog of more than 2,000 pages to industrial users, and it has complemented its broad product range with a high level of customer service.

In 1998, Electrocomponents decided that the catalog-based nature of its business gave it a compelling opportunity to sell its products on the Internet. The site it launched had three goals: to provide a higher level of customer service (by offering, for example, online order confirmation); to reduce costs (an online catalog would lower printing and mailing costs); and to defend the company from attackers, specifically the online marketplaces that were targeting its customers.

That single Web site evolved into two: an interactive site with advanced functionality (for example, inventory visibility, custom pricing, and data on technical specifications) catering to customers in Europe; and a more basic, transaction-only site serving countries in other regions. In addition to maintaining its own sites, the company also is linked to a number of online procurement systems of large corporations and some selected online marketplaces. To avoid channel conflict, Electrocomponents uses the same pricing structure for all its sales channels.

The company says that its push online has produced solid results to date and has been well received by its customers. In particular, it reports that the online sales site has broadened the types of products that customers buy, boosted the average order size per customer, and increased loyalty. The site has also helped Electrocomponents win new customers, particularly in the United Kingdom. The company predicts that by 2003 the online channel will account for 20 percent of its business.
Bringing small and midsize customers online can be difficult. GEHE, a German company that is Europe’s largest wholesaler of pharmaceutical products, solved the problem by removing the major stumbling blocks one at a time.

Since the 1980s, GEHE has conducted business with pharmacies in Germany and the other major European countries electronically through an EDI-based connection. In 1996 it established an Internet-based selling system that offered customers a wider range of products and additional services than the EDI system would allow. They include cutting-edge medical, product, and industry information; training and educational seminars; and special discounts on selected products. The system has proved popular with pharmacies: more than 90 percent of GEHE’s revenues are now generated electronically.

Nevertheless, GEHE initially had trouble converting customers to the system. One of the main problems was mechanical: most pharmacies’ IT equipment was geared to the EDI system and could not support or be easily switched to the Internet-based system. GEHE responded by offering the pharmacies personal computers at discount prices and low-cost Internet access. GEHE also noticed that pharmacists were shying away from the system because they found it hard to use. The company overcame that obstacle by having its sales staff provide on-site demonstrations and additional training.
Initiatives to foster the kind of online collaboration that allows companies to dramatically improve the ways in which they develop products and operate supply chains hold the greatest potential for creating long-term competitive advantage. Indeed, that is how the Internet will ultimately revolutionize industry structures and the pace of innovation.

Substantial investments of both time and resources will be required to realize these gains. Precisely because sophisticated collaboration activities are so challenging to create, they present an opportunity to erect competitive barriers. For exactly this reason, Sandvik Coromant, a Swedish manufacturer of cutting tools, believes that its online build-to-order system will provide a sustainable competitive edge. Developing the system required about 300 man-years. It entailed describing the steps in the production process in a modular fashion and overhauling manufacturing operations so that tools that previously had to be built in craft operations could be made on low-volume production lines.

Companies that invest in online collaboration now, and figure out how to make it work, will gain invaluable insights and experiences that will give them a leg up on competitors. Recognizing as much, a small number of companies have forged ahead, and some are already reaping rewards.

More than 80 percent of the companies BCG surveyed plan to use the Internet to manage their supply chains to some degree by 2004. Almost half of those planning to use the Internet expect the efforts to result in reduced operating costs, and a significant proportion expect them to lower the costs of materials and overhead. (See Exhibit 8.)

**Exhibit 8**

<table>
<thead>
<tr>
<th>Percentage of respondents expecting to realize cost reductions by 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced operating costs</td>
</tr>
<tr>
<td>Reduced material costs</td>
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<tr>
<td>Reduced overhead costs</td>
</tr>
</tbody>
</table>

**Percentage of respondents expecting to realize revenue increases by 2004**

<table>
<thead>
<tr>
<th>Percentage of respondents expecting to realize revenue increases by 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in sales volume</td>
</tr>
<tr>
<td>Increase in prices</td>
</tr>
</tbody>
</table>

Source: BCG survey of 167 production managers in France, Germany, Italy, Portugal, Spain, and the United Kingdom who expect to use online supply-chain management by 2004. (These 167 respondents represent more than 80 percent of the production managers surveyed.)
Many companies also realize that lower costs are not the only potential benefits. They believe that these activities can also help them increase revenues—by boosting sales volumes (mainly through deepening customer loyalty) and by helping companies obtain higher prices.

A number of efforts are already under way to build Internet-based systems and apply them for collaborative forecasting and planning. Such systems are allowing trade partners to manage their collective inventories and utilization of their manufacturing capacity more effectively. Companies are also making progress in developing online build-to-order capabilities, which eliminate the need for inventory at the distribution end of the value chain and improve the ability to respond to customers’ needs and changes in demand.

Improving the predictability of orders. Raffinerie Tirlemontoise, a Belgian sugar producer, is using better information to differentiate itself. Because sugar is a low-value commodity, transportation accounts for a major part of the final cost. To better

Equipment-intensive industries often require large quantities of spare parts. A typical turbine power station, for example, must keep about $6 million ($6.8 million) worth of spare parts on hand. Unfortunately, there can be massive inefficiencies in how such inventories are utilized. Companies can find themselves lacking necessary components at critical stages of production or, at the other extreme, carrying an expensive surplus of parts that are redundant or even obsolete. The blame, almost universally, falls on poor information. Inventory systems within large organizations often cannot “talk” to each other, making companywide inventory management a mixture of judgment and luck. The problem becomes proportionately larger when several companies try to share inventories or manage them jointly.

SparesFinder, based in the United Kingdom, is trying to solve the problem. Founded in 1998, the company links buyers and sellers of engineering spare parts in a series of public and private online marketplaces, enabling companies to share their inventories. The company’s Virtual Pooled Inventory system lets subscribers list and search for products by manufacturer, catalog number, and description. Customers can vary the level of information they share, which allows them, for example, to make all their information on spare parts available to their own sites but only that on select inventories available to other companies. By the end of 2000, the company had more than 90 subscribing corporations and hundreds of user sites in more than 40 countries. Its database is growing rapidly and currently consists of approximately 17 million parts, with a value of £1.5 billion (€2.4 billion).

One of the company’s first clients was BP Amoco, which started a pilot program for its North Sea drilling operations in April 2000. The objective was to increase the visibility of spare parts across BP Amoco so that they could be more effectively redeployed internally, thereby reducing the level of inventories that the company had to maintain. The pilot launch went smoothly: all the sites were operational in three to four weeks, and BP Amoco immediately began to reap cost and time savings. The company is now on track to save £2 million (€3.2 million) in the first year following the pilot’s implementation, and it has identified £1 million (£1.6 million) more in potential savings.

BP Amoco plans to begin extending the system to other areas of the organization and to 20 of its suppliers next year. For the company to make the best use of the system, though, it will need to make organizational and process changes. For example, its trade partners will have to agree on the minimum value of transactions that employees can conduct without seeking authorization from top management. A low minimum value of, say, £5,000 (£8,000) would generate an administrative burden that would quickly exceed the system’s potential value to the companies. But if authorization is required only for parts worth more than £100,000 (£160,000), the administrative burden would be small and the exchange of parts would go smoothly.
manage inventory levels and plan capacity utilization, the refinery installed sensors in its customers’ sugar silos, which it linked to its customers’ production planning systems, its own network, and those of transportation firms. The customers define the parameters for replenishing their stocks, including the inventory level at which automatic orders are triggered. All the information (sugar levels in the silos, transport status, delivery history, and trouble spots) is available in real time on a single Internet-based interface.

The system benefits everyone. It enables customers to outsource management of their sugar inventories. It lets carriers schedule deliveries more efficiently (by giving them real-time access to the inventory levels of the refinery’s customers and the ability to view their usage plans). Finally, it allows Raffinerie Tirlemontoise to improve production efficiency, reduce inventories, and serve its customers better.

**Enabling online build-to-order.** Sandvik Coromant will soon offer customers a Web-based system for buying modified versions of its standard cutting tools. The system—now in the pilot stage—will cap a 15-year effort to reduce the time and cost of pre-production planning, providing quotes, placing orders, and manufacturing standard and modified versions of standard products.

Using the current form of the system, a salesperson can select a product family and modify the standard specifications, if necessary, to meet a customer’s needs. Almost instantly, the system provides a CAD drawing as well as cost and lead-time information for the company’s various manufacturing units. If the customer wants to proceed, all the information needed to process the order and manufacture the product goes instantly into the production planning system of the chosen factory—the one that can fulfill the order the fastest or at the lowest cost. As a result, order-to-delivery times for modified versions of standard tools have plunged from 6 to 12 weeks to 2 to 3 weeks, and the company can now profitably offer customers a much larger range of “standard” products.

To move the system to the next stage, Sandvik Coromant is writing software so that customers will only have to describe their needs (the intended application) and the system will be able to select the tool. It is also automating the process for choosing the production unit that makes the tool.

**ONLINE PRODUCT DEVELOPMENT**

Outside the software industry, few companies are using the Internet to any significant extent to develop new products. Of the companies we surveyed, only 40 percent expect to be reaping benefits from such activities by 2004. More than half of this minority believe that online product development will enable their companies to lower product costs and increase sales volume. (See Exhibit 9.)

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### Exhibit 9
**Areas Where Companies Expect to Benefit from Online Product Development**

<table>
<thead>
<tr>
<th>Product Development Area</th>
<th>Percentage of Respondents Expecting to Realize Benefits by 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced costs per unit</td>
<td>53%</td>
</tr>
<tr>
<td>Reduced design time</td>
<td>48%</td>
</tr>
<tr>
<td>Increase in sales volume</td>
<td>61%</td>
</tr>
<tr>
<td>Increase in prices</td>
<td>10%</td>
</tr>
</tbody>
</table>

**SOURCE:** BCG survey of 81 production managers in France, Germany, Italy, Portugal, Spain, and the United Kingdom who expect to use online product-development tools by 2004. (These 81 respondents represent about 40 percent of the production managers surveyed.)
over, this minority expects the size of the benefits—including shorter product-development cycles, lower costs, and increases in sales owing to enhanced responsiveness to customer needs—to be substantial. Kvaerner, an Anglo-Norwegian engineering and construction group, and Gemplus, a fast-growing French manufacturer of "smart cards" for wireless phones, banking cards, and security systems, are two early movers in this area.

**Online project management.** Kvaerner uses an online system to permit its engineers, contractors, and customers to share CAD drawings and other information needed for engineering projects. This allows for real-time collaboration among the three groups regardless of their locations. The result is reduced expenses—in part because work can be outsourced to countries with lower labor costs, such as India. But most important, the system saves time because it permits work for fast-track projects to be passed across time zones.

**Online collaborative design.** Rather than launch an online procurement initiative, Gemplus plans to concentrate its business-to-business e-commerce efforts on improving the customer’s experience. By this it means working more closely with its customers to improve the design and delivery of its smart cards. Gemplus believes that the result will be greatly increased loyalty.

As a first step, the company is launching a pilot project this year with four big customers of its most important division, telecommunications. The test will link online requests for proposals (RFPs), ordering, and order tracking with Internet-based design and forecast-and-demand planning. The collaborative design technology will let customers add or remove technical specifications on products or services during the design step, as well as examine and approve prototypes. The planning tool will permit Gemplus to adjust production automatically when clients need to increase or decrease their orders suddenly. This capability will allow the company to provide customers with more reliable delivery dates, which, in turn, should give them more flexibility in managing inventories. Gemplus hopes that the system will lead to closer relationships with customers. In fact, upon hearing of the company’s online plans, some customers said they might be interested in having it manage their inventories of smart cards and chips for them.

### Choosing Where to Play

Deciding how and when to participate in business-to-business e-commerce requires an understanding of the value potential of the possible activities and how they are likely to evolve. Some types of activities will evolve in a strictly linear or sequential fashion: easier-to-implement activities will have to be developed before tougher-to-implement activities. For example, online purchasing must precede collaborative inventory management.

But the development of other activities does not have to be sequential. The creation of online services to support collaborative product design does not necessarily require online purchasing activities to be in place, because they are independent activities and involve totally independent flows of information. So although some companies will begin with simple catalog-purchasing transactions, others will tackle more complex collaboration initiatives from the outset. (See the insert “Setting Priorities for Initiatives,” page 26.)

Industry dynamics and internal business processes are other important factors. The number of players, the relationships among them, and the information infrastructures supporting those relationships vary by industry. So it follows that the value of individual functional activities and the constraints on their development will vary enormously by industry. In situations where buyer-supplier relationships and purchasing processes are relatively unsophisticated and decentralized—or not part of the main production process—the biggest initial gains will be in the form of much lower search and transaction costs. For example, purchases of experimental chemical reagents for R&D by pharmaceutical companies fall into this category.

But in the automotive industry and others in which buyer-supplier relationships are well established and the purchasing process is fairly sophisticated,
companies are likely to make different choices. They are likely to focus relatively early on functions that make it easier for them to collaborate in managing inventories, designing products, and performing other, more complex activities. Their online activities will progress beyond purchasing to in-depth information sharing and project and design management.

A major question for companies is which activities to tackle themselves and which to do in concert with others. Because of the logic of sharing the significant costs and risks involved, and the increasing need to define industrywide standards, companies initially turned to e-marketplaces as the solution. However, as companies now focus on more complex online activities such as supply chain management and product development, they are deciding to keep those activities private. One reason is that they consider them to be sources of competitive advantage. Another is that these activities often involve the sharing of sensitive data and the development of specific technological solutions. This shift to private initiatives helps explain the turmoil now sweeping public e-marketplaces.

Before companies can begin to set priorities for potential e-commerce initiatives, they must explore the entire range of opportunities. In doing so, it is useful to think broadly about the basic nature of each one, the places to look for it, or the circumstances that might give rise to it. For example, the nature of a particular opportunity might be increasing sales, reducing costs, or improving operating efficiency. The opportunity might arise while a company is cooperating with competitors or supply chain partners. Or it might emerge because of structural changes such as the deconstruction of traditionally integrated activities into standalone businesses.

To assess the attractiveness of individual opportunities, it is useful to evaluate them along two dimensions—value and probability of success—and plot them on a simple matrix. (See the exhibit “A Basic Framework for Screening and Prioritizing Ideas.”) The value of each initiative should be judged by assessing its strategic attractiveness, the potential of the product or service in question, the effect on relationships with suppliers or customers, the economics (expected returns), and the potential to learn something from the initiative that has broader application. The initiative’s probability of success depends on the degree of change required in the organization, strategic consistency (that is, the fit of the required competencies and capabilities with existing ones), technological complexity, and associated costs and risks.

Of course, companies should immediately pursue high-value opportunities that have a good probability of success, and they should drop low-value opportunities with a limited chance of success. However, it is much more challenging to define an action plan for high-value opportunities with an uncertain success rate. One option worth considering is seeking partnerships to share the costs and risks.

**Setting Priorities for Initiatives**

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**A Basic Framework for Screening and Prioritizing Ideas**

<table>
<thead>
<tr>
<th>Potential high-priority projects</th>
<th>Probe</th>
<th>Accelerate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of the initiative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probability of success</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: BCG analysis.
REVISITING THE ROLE OF E-MARKETPLACES

There are more than 500 public e-marketplaces across Europe. But many are still in the start-up phase, not fully operational, or struggling to survive. To defray its operating costs, a big public e-marketplace has to attract a very high volume of transactions, and there is currently a plethora of exchanges relative to the available transaction volume. Indeed, a shakeout has already begun among European public e-marketplaces, and it promises to shrink their ranks substantially.

The bloodbath among independent online exchanges—e-marketplaces not owned by industry consortia—will not be as severe in Europe as the one under way in the United States. But that is only because not nearly as many independents got off the ground in Europe in the first place. (See the insert “The Future of Independents,” page 28.)

CONSORTIA WILL DOMINATE

The most powerful players will be e-marketplaces sponsored by consortia of the leading incumbent corporations in a sector. These ventures will have the liquidity, geographic reach, expertise, and relationships to serve an industry’s overall needs, including the purchasing of both indirect and direct goods, as well as services that support collaboration activities such as designing products and managing inventories. (See Exhibit 10.)

BCG’s analysis suggests that most industries will be able to support only one to three major e-marketplaces. That said, some industries are composed of distinct vertical sectors and may end up

<table>
<thead>
<tr>
<th>Exhibit 10</th>
<th>Number of Consortium-Founded E-Marketplaces by Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Europe</td>
</tr>
<tr>
<td>Energy/utilities</td>
<td></td>
</tr>
<tr>
<td>Chemicals/petrochemicals</td>
<td></td>
</tr>
<tr>
<td>Machinery</td>
<td></td>
</tr>
<tr>
<td>Automotive</td>
<td></td>
</tr>
<tr>
<td>Metals/steel/mining</td>
<td></td>
</tr>
<tr>
<td>Traffic/transportation</td>
<td></td>
</tr>
<tr>
<td>Pulp/paper/printing</td>
<td></td>
</tr>
<tr>
<td>Agriculture/forestry</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>Consumer goods/retail</td>
<td></td>
</tr>
<tr>
<td>Hospitality</td>
<td></td>
</tr>
<tr>
<td>Health care/pharmaceuticals</td>
<td></td>
</tr>
<tr>
<td>Electronics/high tech</td>
<td></td>
</tr>
<tr>
<td>Aerospace/defense</td>
<td></td>
</tr>
<tr>
<td>Telecommunications</td>
<td></td>
</tr>
</tbody>
</table>

Source: BCG research.
THE FUTURE OF INDEPENDENTS

Many independents that had aspired to become major exchanges are now abandoning their hope of achieving scale. Instead, they are pursuing the option of becoming niche players that either serve special segments of industries or specialize in a function that can be applied across many industries. Two types of niche players are matchmakers, which aggregate demand in highly fragmented industries, and specialists, which provide functions such as auctions or value-added services such as finance, logistics, and collaboration tools for product development.

Another option some independents are contemplating is becoming application service providers. For example, U.K.-based Mondus, a fully operational e-marketplace for small and midsize businesses, says that in the future its technology could be sold as a standalone piece of software. Xbridge, another British start-up, decided to focus exclusively on being an application service provider from the outset. It creates and operates customized e-marketplaces for individual companies, and enables them to offer sophisticated online functions such as automated requests for quotes (RFQs).

Some independents may be able to hang on by forming strategic partnerships with traditional corporations. For example, Mondus received a $150 million (£170 million) investment last August from Italy’s SEAT Pagine Gialle (Yellow Pages). SEAT will connect the 5.9 million companies that already use its offline information with Mondus’s electronic platform and share the transaction revenue.

Because most independents use different technology platforms, mergers will probably not be a viable option for those that cannot make it on their own as major e-marketplaces. But some independents hope that strategic partnerships with one another will work. For example, Metals-Russia.com, which was established as a bridge between the East and the West for aluminum trade, is forming several alliances with market makers, including Russky Aluminy in Russia and Aluminium.com, an independent in the United States.

with one or two focused e-marketplaces serving each sector’s needs. In other words, an industry’s shared characteristics—in terms of the products purchased, the sellers and buyers, and the purchasing and collaboration processes employed—will determine the structural boundaries of a sector that an e-marketplace can address.

The consumer goods and retail sector, where four large online marketplaces have been established by various consortia of incumbents, illustrates the forces that will eventually dictate how many e-marketplaces survive. Currently, almost every large retailer and supplier participates in at least one of the four exchanges. But it is still an open question how these online marketplaces will evolve and whether all four of them will survive. What happens

will be determined by several factors, including the following:

Volume. Will there be enough to support all four? When these online marketplaces were established, each focused on either the United States or Europe. But all quickly decided that theirs was a global market, and they now compete head-on. Obviously, one critical question is how many industry players use the various e-marketplaces. But another is the portion of total procurement that the participants conduct on the exchanges. Will companies use the exchanges to buy and sell their full range of products and services, or will they adopt a hybrid approach and buy strategic goods and services from their private sites?

Ownership. Is the for-profit model sustainable? One of the exchanges is a "utility" whose main aim is serving the interests of the industry, not max-

<ref footnote>GlobalNetExchange and Worldwide Retail Exchange were founded by retailers, and CFMarket.com and Transora were founded by consumer goods companies.</ref>
mizing profits. It aspires to sign up all members of the supply chain. But the other three are for-profit exchanges. If participants use the e-marketplaces only for nonstrategic purchasing and keep their strategic transactions private, the for-profit exchanges will have trouble surviving.

Standards. Who will succeed in setting them? Three of the exchanges, including the utility, have begun cooperating to define uniform standards for the entire supply chain. As a result, it is highly unlikely that the other exchange will be able to go it alone. Whether this means that all the exchanges will eventually work together closely—or even merge—remains to be seen.

THE TIME TO RETHINK STRATEGIES

In light of the current environment, even online marketplaces backed by consortia have to revisit their strategies. When they were originally established, many consortium-backed exchanges intended to have an IPO at some point in the future. They saw IPOs as a way to both raise capital and lure senior managers to join them. The e-marketplaces therefore needed to create their own independent strategies and agendas rather quickly. But with IPOs no longer on the table for the vast majority, they are having to reassess their objectives and realign them with the needs of their backers. In many cases, this means focusing on relatively prosaic tasks, such as setting standards. This shift in the focus of e-marketplaces comes at a time when a growing number of corporations are themselves revisiting their rationale for participating in exchanges.

For many e-marketplace participants, the world has changed dramatically since they first signed on to the ventures. At the time, incumbent corporations were joining forces to defend themselves against the dot-com start-ups that were targeting their customers. Their rationale was that a consortium model guaranteed the necessary critical mass of volume. In addition, many counted on a successful IPO to generate the capital that would both fund the continued growth of the exchange and give their own market capitalizations a boost.

The reality is that most of the participants in e-marketplaces developed their original strategic logic for joining the exchanges with great haste. Now that many of their assumptions have been dashed, they need to revisit their objectives and commitment. They should consider the amount they are willing to invest, the forms and levels of the returns they are seeking, the activities they are willing to conduct on public e-marketplaces, and those they want to conduct on their private sites. The business strategy, of course, should dictate the choices. But in making their choices, companies should also consider how they can use e-marketplaces to meet the biggest challenge they face in tapping the potential of business-to-business e-commerce: transforming their organizations, processes, cultures, and systems. E-marketplaces can serve as powerful catalysts for change.

3. Standard setting is likely to be a long and politically fraught process. It took seven years for retailers and consumer goods companies to agree on standards for efficient consumer response (ECR), and they are still not fully implemented.
Making business-to-business e-commerce—especially online supply-chain management and product development—work requires much more than just deploying a new technology. It entails a wholesale transformation of how companies operate and are organized. It is therefore unrealistic to expect to accomplish this overhaul in a big bang. One clear lesson learned from the problems and disappointments of implementing enterprise resource planning (ERP) systems is that such sweeping initiatives require a step-by-step approach.

The changes that companies must accomplish range from the way their factories monitor and maintain inventories to the way they work with their suppliers to design products. The hurdles include the effort and investment required to train employees, revamp long-established processes, and sign up trading partners; the complexity of integrating systems; the difficulties in coping with the competing standards of different marketplaces; and the fear of losing control over strategic activities. Indeed, the areas of e-commerce that offer the greatest potential for creating competitive advantage require the most sweeping cultural and behavioral changes—both in a given company and in its supply-chain partners.

Changing Structures, Processes, Cultures, and Systems

Almost every company we surveyed recognizes that transformation is a critical issue. However, not one has fully addressed the challenges involved in three crucial areas: organizational structures and processes, corporate culture, and technology systems. Some companies we interviewed acknowledged that they had not even begun to address these challenges. There are a number of imperatives for action in each area.

Do not shy away from making tough but essential changes to business processes and organizational structures. The British retailer Tesco expects the transformation challenges for its organization to be even more demanding than those for previous initiatives, such as efficient consumer response (ECR) or category management. But many other companies either overestimate their existing capabilities, underestimate the magnitude of the change required, or both. In addition, we have found that many companies shy away from the difficult tasks involved in organizational change—for example, revamping incentive systems, replacing people with inadequate skills or rigid mindsets, and, most important, reducing the number of employees. Some business leaders mistakenly hope that they will be able to achieve solid business results without making such changes.

The required changes will affect everything from structure and governance to roles and responsibilities. The kinds of fundamental changes that Legrand, a French manufacturer of electrical components for the construction industry, expects to have to make are representative of those facing all companies. One of the chief goals of the private online procurement platform that Legrand is testing is to centralize purchasing. To achieve economies of scale and exploit potential synergies, the company is creating two regional centers for pur-
chasing—one in Europe and one in the United States. However, this move will require taking the authority for managing purchasing away from its subsidiaries, which is easier said than done. In addition, it will require changes in the roles and skills of purchasing agents for direct goods. The online system will reduce the time that these agents must devote to purchasing transactions, freeing them to deepen their knowledge of suppliers’ capabilities and broaden the stable of potential suppliers.

Orchestrate the cultural changes that are a prerequisite for new behaviors. Most managers realize that an organization’s culture is what ultimately determines its members’ behavior. But as many managers also know, a lot of companies ignore this

Nestlé, the world’s largest food and beverage concern, is enlisting the Internet in its efforts to surmount a fundamental challenge: how to increase profitability in a relatively low-growth environment. The Swiss company’s growth strategy rests on four pillars: improving operating efficiency, fostering innovation, maximizing sales, and enhancing communication with customers. It believes that leveraging the Internet will help on all four fronts and that speed to market is critical.

Nestlé’s underlying assumptions are twofold. Since online channels are experiencing much higher growth rates than offline channels, being a leader in developing online capabilities will help it generate gains in market share. In addition, the Internet will make it more cost-effective to continue to expand the reach and scope of Nestlé’s business. Currently, the company has more than $46 billion ($52.1 billion) in annual revenues, 230,000 employees, 8,000 products, and operations in more than 80 countries.

To improve operating efficiency, Nestlé has taken several rapid steps, including a decision to invest as much as $1.8 billion ($2 billion) over the next three years in new technology and Internet initiatives. They include a $200 million ($226 million) contract with German software firm SAP—the largest sale ever for SAP—to streamline Nestlé’s many systems into a single, standard Web-based platform. Two major aims of the platform are to improve communication and information sharing among employees, and to make higher-quality financial information available to managers. The challenge is to implement the new technology on such a large scale.

To foster innovation and learning, Nestlé has empowered its divisions and local offices to launch their own Internet initiatives. It insists, however, that each project be aligned with groupwide efforts. To keep track of its many initiatives, Nestlé formed an organizational learning network composed of regional e-business “nodes,” which are responsible for exchanging best practices. Top management plays two roles in this process: as members of the learning network and as formulators of the “genetic code” for developing standards and platforms for learning.

To maximize sales and enhance communication with consumers, Nestlé is also launching consumer lifestyle sites on the Web that focus on such topics as baby food, nutrition, and pet food. It is counting on portals to feature its sites prominently, thereby steering interested consumers its way, and is also linking its sites to online retailers that sell relevant Nestlé products. In this fashion, the company hopes that it will be able to establish direct links to consumers and continue to support traditional distribution partners.

Nestlé believes that it is a leader in the ways it is using the Web, and points to the significant results that its Internet initiatives are already producing. They have helped the company slash expenses by almost $2 billion, or $2.3 billion. (Nestlé reports some success in the online procurement of both direct and indirect goods in a few countries through both auctions and catalog-based transactions.) In addition, it has engaged in some successful collaborative efforts with important customers. For instance, a promotional event with British retailer J Sainsbury was managed entirely online—including planning, production and launch, and event tracking. Last but not least, Nestlé executives say, the initiatives are helping their huge company become more nimble.
entails a sober assessment of the challenges involved in building the infrastructure required for each initiative. (For example, it is often tougher to implement an online procurement system than an online sales platform.) The assessment requires understanding the capabilities of current technologies and how technologies are evolving. Only through such an assessment can a company determine the relative strategic values of possible initiatives.

To transform themselves, companies must take a comprehensive approach to implementation. Although the involvement of top management is crucial, it alone will not suffice. Winning the support of key stakeholders such as suppliers, distributors, investors, different divisions of the organization, and end users is equally important. It requires clear communication and a road map of where the organization is heading.

A company cannot remake its culture and behaviors in one fell swoop. Such an undertaking involves scores of steps, both large and small. For example, one obvious change that business-to-business e-commerce requires is to get employees in the habit of using the company’s computer system. SAirGroup, the holding company of Swissair, recognized this basic need when it launched an initiative to develop an online system for purchasing indirect goods for the entire group. One of the company’s chief aims was to eliminate maverick buying. But the only way SAirGroup could hope to do that was to get most of its employees to use the system. One hurdle was just getting them accustomed to logging on to it routinely. To that end, the company has put human resources offerings such as health and insurance information on the system. And in a joint deal with Compaq, SAirGroup has given its employees personal computers so that they can connect to the system from home.

Avoid the IT traps and roadblocks. Many technical challenges must be overcome, including setting standards for data formats, integrating new online systems with other internal and external systems, ensuring security, and authenticating users across systems and organizational boundaries. In addition, there are three general traps that companies need to avoid. The first is relying too heavily on IT vendors. Many vendors lack implementation skills. So to make sure they are not at the mercy of such vendors, companies will have to possess the in-house expertise to manage them. The second trap is becoming dependent on a vendor’s particular IT standards. The final trap is underestimating the demands that different initiatives will impose on a company’s IT infrastructure. Avoiding this trap entails a sober assessment of the challenges involved in building the infrastructure required for each initiative. (For example, it is often tougher to implement an online procurement system than an online sales platform.) The assessment requires understanding the capabilities of current technologies and how technologies are evolving. Only through such an assessment can a company determine the relative strategic values of possible initiatives.
information had to be developed or compiled. It also meant working with TexYard to define standards, especially for product descriptions. In some instances, there were no standards; in others, the existing standards were not sufficiently specific. Training buyers and suppliers and getting them onboard was also of utmost importance. Because of KarstadtQuelle’s purchasing power, suppliers were generally willing to use the system, but they lacked the equipment and skills. To help them, TexYard lined up local Internet service providers to offer Internet access at an attractive price. Both the suppliers and KarstadtQuelle’s buyers had to be trained to use the new technology. It also took extensive training and regular communication to assuage buyers’ concerns about their new roles and to convince them that they would end up benefiting from the new system.

Securing the backing of incumbent technology providers was crucial as well. Their support was needed to integrate legacy systems with the new online platform or to transfer functions to it.

Of course, the process of transforming a business begins with the development of a clear strategy and the creation of an appropriate organizational architecture. But in the end, the best strategy and organizational design will not be worth much if the implementation is not carefully thought through or if it is carried out halfheartedly. The companies that are the most aggressive in transforming their businesses stand to gain the most.
Business-to-business e-commerce is already reshaping the competitive landscape in Europe, and its scope and impact will continue to grow dramatically in the coming years. It will affect a broad spectrum of industries in four fundamental ways.

RADICALLY REDUCING TRANSACTION COSTS

Internet technology will continue to drive down the cost of exchanging information. One result will be an inexorable decline in the unit cost of processing transactions. As new technologies and standards replace older, more expensive ones, and as automation eliminates steps and error rates fall, transaction-processing costs will plunge. Early movers are already experiencing sharp reductions. For example, some companies have slashed their average cost of processing a transaction from €60 to €2 by using the Internet. Such declines will trigger changes in the way companies conduct business with each other. For instance, it will lead them to place a higher number of smaller orders.

The plummeting cost of exchanging information will also make the cost of searching for and selecting new suppliers vastly cheaper. Online providers of services such as ratings, authentication and validation, secure payments, and escrow will reduce the cost of finding and choosing suppliers, and will build the security and trust needed to ease companies’ concerns about dealing with each other online. Ultimately, both buyers and sellers will have more choices and be able to make better ones as a result of better information. Companies will use the Internet to shop around much more systematically and extensively than in the past. As a result, buyers will greatly increase the number of suppliers of commodity products and services with which they interact and will switch suppliers much more frequently. Relationships will become even less secure.

Plunging transaction costs will reshape corporate boundaries. Both theory and practice have shown that wherever companies find it expensive or overly complicated to use third parties for given activities, they perform them in-house. Conversely, companies are happy to buy activities from external parties when it is easy and cost-effective to do so. By dramatically reducing transaction costs, new technology will enable companies to externalize many activities that heretofore were too difficult. This is already happening. For example, the largest pharmaceutical companies are outsourcing key parts of their processes for developing new drugs, and many human resources departments are outsourcing the management of health and pension benefits.

Such actions are merely initial steps in a broader movement to deconstruct and reconstruct industry value chains. Over the next decade or so, there will be giant strides and the structure of companies and industries will be redefined—as the informational glue that had held relationships together dissolves in some instances and hardens in others, strengthening the bonds.

FOSTERING NEW FORMS OF COLLABORATION

Obviously, not all suppliers can or should be treated as if they were interchangeable. The precipitous drop in the cost of exchanging information will allow strategic partners to share much richer
information and work with each other in unprecedented ways. This will lead to a deepening of some relationships—but only those in which greater collaboration can create value for all parties.

New types of relationships between suppliers and buyers, and between competitors, will develop as companies recognize the potential benefits of online collaboration. Some examples are already emerging. Witness the dramatic growth in the number of industrywide consortia to construct online marketplaces. These consortia are building critical mass, setting de facto standards, and reducing the risk that their members must shoulder by letting them share the costs of IT and other infrastructure-related investments. The ownership structure of the e-marketplaces gives incumbents a degree of control over a potentially disruptive new business model. But these exchanges will be supported and nurtured by their backers only as long as they continue to create value for them—or at least offer the prospect of doing so.

Online collaboration also promises to improve overall efficiency—for example, by speeding up and reducing the cost of product innovation or by shrinking the amount of inventory in the whole supply chain. Consider the potential gains that the automotive industry could reap. Car companies sit at the end of a long supply chain. (For example, a seat manufacturer typically buys fabric for upholstery from outside suppliers, which, in turn, might purchase the thread from yet other companies.) It is a supply chain that suffers from the need to hold inventories at each link. The problem is exacerbated by the need to deal with a high degree of variety (all the possible feature combinations), volatile demand, product obsolescence, and consumers’ understandable preference for ordering exactly what they want rather than buying what happens to be on hand.

The collaboration that the Internet allows promises to transform the auto industry. It will permit elements of design to be pushed back to suppliers, which will ensure that manufacturability is designed into the component. It will allow players throughout the chain to see actual demand from end customers, which will help the whole chain reduce inventories and increase the speed at which it can respond to changes in demand. And, by enabling the supply chain to build cars to order in a time frame acceptable to consumers, it will slash the incentives (discounts) that companies have to employ to move unwanted or excess stock.

In other words, online collaboration will let companies develop better products faster and at lower cost. But it means that every company will need to make hard decisions about where and with whom it chooses to collaborate, cooperate, or compete. And this does not apply only to buyer-supplier relationships. Companies should begin to think about how online collaboration can alter other relationships: between employers and employees; consumers, consumer advocates, and corporations; and private enterprises and government bodies.

SHIFTING THE FOCUS FROM PRICE TO TOTAL VALUE

The Internet is enabling companies to gain access to an unprecedented quantity of high-quality information. This rich information will allow them to develop new approaches to evaluating and comparing both suppliers and customers. A lot of companies focus largely, if not exclusively, on price in making many of their sourcing decisions. By making it possible to understand much more clearly the bottom-line impact of sourcing decisions, the Internet will cause companies to apply a much broader range of metrics.

Selecting trucks for a commercial fleet provides a simple example. A potential buyer wants to understand the total lifetime impact of buying one type of truck versus another—in other words, the total costs and benefits of owning and operating each type of truck over its lifetime. To make this comparison, the buyer needs complete information on the lifetime economics of each model (purchase price, fuel consumption, maintenance costs, reliability, and resale value) and the characteristics of its own business (the tonnage of the goods to be transported, the distance they will have to be conveyed, and the cost of downtime or truck failure). As reliable online-comparison services emerge that make
it easy to obtain and digest such information, fleet owners will be able to make better decisions about the trucks they buy. But the information will flow two ways: truck manufacturers will be able to obtain rich feedback faster, which they can use to adjust production schedules as well as the designs of new products.

This phenomenon will sweep virtually all industries, resulting in a dramatic improvement in the efficiencies of national economies. As online collaboration tools and information services grow and become more sophisticated, they will encourage managers to choose suppliers on the basis of the total value that they deliver. In the future, a purchaser of drill bits will buy on the basis of the total cost of producing a hole, rather than the price of the bit alone. But this phenomenon also creates massive opportunities for suppliers to differentiate their offerings.

"DE-AVERAGING" CUSTOMER PROPOSITIONS

All companies face a tradeoff between the benefits of customizing an offering for a subset of customers and the cost of supplying the customized offering. In the many instances where the benefits have not justified the cost, companies have simply provided a standard, or average, offering to the whole market, and everyone has been the loser. Buyers have to purchase products that do not exactly meet their needs, and suppliers end up either overdelivering or underdelivering to all their customers. The Internet is drastically reducing—or even eliminating—this tradeoff by lowering the cost of customizing offerings. The result will be a de-averaging of the customer proposition as companies tailor their offerings to the needs of a specific customer or specific segments.

This capability is already having a significant impact on pricing. A growing number of companies are applying customer- or segment-specific price lists to online sales. And some suppliers are already exploiting the dynamic pricing that the Internet makes possible: they are using the Internet to price goods and services much more rapidly in response to fluctuations in supply and demand.

By enhancing their ability to customize the bundle of services that they wrap around a product, the Internet is also allowing many companies to reduce their vulnerability to price competition. Although providing online order entry and management to a customer may reduce a supplier’s costs, the supplier may be able to charge for such services if it can make their value apparent to the customer.

To be able to customize offerings, however, companies must often reengineer physical processes—for example, the way Sandvik Coromant, the cutting tool company, revamped its manufacturing operations. The most difficult forms of de-averaging to replicate—and therefore the ones that provide the most sustainable advantages—are often those that use the Internet to exploit a powerful offline capability.

TAKING ACTION

Each of these four trends is important on its own, but together they are mutually reinforcing and will unleash enormous value throughout national or regional economies. Much of that value will ultimately flow to end customers, including consumers, in the form of more choice, better propositions, and lower prices. But some companies—the ones imbued with a value perspective—will ride these trends and reap immense rewards. They will be among the first to reduce transaction costs and to realize the opportunity to outsource activities that don’t create value. They will collaborate warmly and sincerely where it helps, and switch and bait mercilessly where that helps. They will market and tailor their offerings to capture the value they create.

For the most part, these companies will be incumbents that have taken the lead in identifying the potential of specific forms of e-commerce in particular markets, moved early, and excelled in implementation. They will not necessarily be the current industry leaders. The companies that neglect to grasp the challenge or fall short in execution will see their competitive position erode irrevocably.
To secure a place among the winners, companies must use the coming period of rapid innovation and growth to build on existing capabilities and sources of advantage in order to create new capabilities and new sources of advantage. Companies must act now to realize the opportunity. Every business should make sure that it is taking the following fundamental actions:

**Focus on creating advantage in the core business.** Many companies we interviewed have been conducting their experiments in nonstrategic areas. They must now shift their attention to the heart of the business, think expansively about future options, and identify where the sources of long-term advantage are or might be. They can start by answering some basic questions about the fundamental sources of advantage in a business segment today and the impact that e-commerce will have on them: How can online capabilities be employed to address existing tradeoffs or compromises along the value chain? How might they be used to increase customer value? Which business activities will a company need to control and which operations will it be able to outsource?

**Establish clear priorities.** This involves setting short- and medium-term goals, and revising the way risk is managed to take into account the unpredictability and long time span of some online initiatives. Such a framework should not be created in a vacuum. Business leaders must factor in the actions and positioning of their competitors, suppliers, and customers. Next, they should identify the initiatives that will generate the greatest potential returns and have the highest probability of success. Some basic questions to be answered include the following: What sequence of initiatives will minimize the risks and maximize the returns? How can a company change industry dynamics to its advantage? What should it do on its own and where should it cooperate with competitors? As e-commerce evolves, what aspects can a company influence and what elements are beyond its control?

**Track ongoing activities and incorporate the learning.** Many companies are already deeply involved in e-commerce, but few continuously monitor their initiatives, gather knowledge from them, and apply the lessons. Instituting such a process will help a company focus its efforts on the initiatives that are working and allow it to kill failures sooner rather than later. Given the rapid rate at which business-to-business e-commerce is developing, this process of learning and refocusing is crucial. To create such a process, a company should begin by answering some basic questions: How should it measure the success of its current online activities? How will such activities change its relationships with suppliers, dealers, and customers? Will it face channel conflicts? Which activities should it conduct on a public exchange and which ones should it conduct privately?

**Drive change throughout the organization.** The transformation challenge that lies ahead is as big as the challenges that companies faced in reorganizing to capitalize on the advent of commercial electric power. That took roughly half a century. The Internet is reaching critical mass much faster, which makes the challenges even more daunting. To tackle them, a company should ask some more basic questions: What organizational structures and processes must be changed? How quickly can it change them? How quickly does the company need to change? What are the risks and benefits of moving even faster? How can the company help its supplier and other counterparts get ready? What does it want the corporate culture to be? How will it overcome IT hurdles?

As was the case with previous seminal advances in technology, the full extent of the Internet’s impact will take many years. This means that the evolution of business-to-business e-commerce may take longer than companies had initially anticipated. But business leaders must not mistake the failure of some of the early experiments—including the early online exchanges—to mean that this advance is less important or less pressing than they first thought. Quite the contrary. It is time to take e-commerce even more seriously. It is time to embrace it and to capitalize on the opportunity it presents for generating lasting competitive advantage.
The research consisted of three different surveys. Two of them, involving 1,033 procurement managers and 1,103 sales managers, were conducted in all 17 countries. The third survey, which dealt specifically with Internet-related supply-chain management and product development, involved 204 managers in 6 countries: France, Germany, Italy, Portugal, Spain, and the United Kingdom.

In choosing the companies to interview from a pool of more than 20,000, we set quotas to reflect the relative size of the different markets and industry sectors. However, we deliberately skewed the sample toward large companies: more than 75 percent had revenues exceeding €50 million, and more than 40 percent had a turnover above €250 million. The rationale for weighting the sample in this manner was that larger companies were likely to be more advanced in their use of business-to-business e-commerce.

We also talked to managers at more than 100 European e-marketplaces. We asked them about their business models and how they are reacting to the evolving business-to-business landscape.

Finally, we synthesized the knowledge that BCG has acquired by helping e-marketplaces and companies throughout Europe develop their e-commerce strategies.

We carried out quantitative research involving 2,340 managers in 17 countries between December 2000 and February 2001. The managers were drawn from all industries. The 17 countries were Belgium, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, and the United Kingdom.

The interviews were conducted over the telephone by an independent market-research firm under the regulations of ESOMAR, the international association of opinion and marketing research professionals. BCG then analyzed the raw data.

We used a four-step, bottom-up approach to estimate market size and growth. The first step was to...
estimate gross purchases per industry. We did this by aggregating intermediate consumption, purchases of merchandise, and acquisitions of machinery and equipment. The raw data for this part of the analysis came from Eurostat, the statistics office of the European Union; the national statistics offices of Norway and the various Eastern European countries; and the Swiss Federal Institute of Technology in Zürich.

The industries we surveyed were primary production (agriculture, forestry, and fishery products; ferrous and nonferrous ores and metals; and nonmetallic mineral products); chemicals and petroleum; construction; consumer goods; electrical and electronic equipment; financial services; metals and machinery; other business activities (business services, real estate leasing and sales, machinery leasing, private health services, and recreational services); hotels and restaurants; postal and telecommunications services; pulp and paper; retail (including wholesale); transportation; and vehicles.

The second step was to estimate the projected growth in gross purchases for each industry. To do that, we used the forecasts for gross product growth for each industry as a proxy. The source of the data for all countries with the exception of Eastern Europe was Prognos. For the Eastern European countries, we used a combination of data from the national statistics offices and BCG estimates.

We then combined the gross purchases for each industry with actual and projected rates of adoption of business-to-business e-commerce, which came from the survey of procurement managers. Finally, we reaggregated the individual components to arrive at overall figures for each country and for Europe as a whole.

Where information sources were unavailable or unreliable for a particular industry, we estimated the variable by analyzing similar industries. It is important to note that although we tested the projections against those in other publicly available reports and against the findings of our in-depth interviews, the projections are based largely on the responses to the quantitative survey. Since the survey asked respondents to predict the proportion of their purchases that would be conducted online by 2004, the projections reflect the companies’ expectations rather than BCG’s predictions.
The Boston Consulting Group has issued a series of publications on e-commerce. It includes the following:

- Arming for E-Combat in Asia Pacific: The New Rules of Engagement
  A BCG NetBizAsia strategy report, February 2001

- Vital Signs: The Impact of E-Health on Patients and Physicians
  A report on the U.S. market by The Boston Consulting Group, February 2001

- Winning the Online Consumer 2.0: Converting Traffic into Profitable Relationships
  A report by The Boston Consulting Group, February 2001

- Patients, Physicians, and the Internet: Myth, Reality, and Implications
  A report on the European market by The Boston Consulting Group, January 2001

- After the Land Grab: B2B E-Commerce in Australia and New Zealand
  A report by The Boston Consulting Group, December 2000

- Mobile Commerce: Winning the On-Air Consumer
  A report by The Boston Consulting Group, November 2000

- The Business-to-Business Opportunity: Creating Advantage Through E-Markplaces
  A report by The Boston Consulting Group, October 2000

- Online Retailing in Latin America: Beyond the Storefront
  A BCG report in partnership with Visa International, October 2000
  (Available in English, Spanish, and Portuguese)

- Organising for E-Commerce: Global and Asia-Pacific Challenges
  A BCG NetBizAsia strategy report, September 2000

- The U.S. B2B E-Commerce Landscape Through 2004
  A research bulletin by The Boston Consulting Group, September 2000

- Racing Season: B2B E-Commerce in Germany
  A report by The Boston Consulting Group, August 2000
  (Available only in German)

- Organizing for E-Commerce
  A discussion paper by The Boston Consulting Group, April 2000

- The State of Online Retailing 3.0
  A Shop.org study by The Boston Consulting Group, April 2000

- E-Tail of the Tiger: Retail E-Commerce in Asia-Pacific
  A BCG NetBizAsia strategy report, March 2000

- Winning the Online Consumer: Insights into Online Consumer Behavior
  A report by The Boston Consulting Group, March 2000

- The Race for Online Riches: E-Retailing in Europe
  A report by The Boston Consulting Group, February 2000

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