

# E-Commerce Trade & B2B Exchanges

April 2003



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## Welcome to eMarketer

Dear Reader:

Welcome to the *E-Commerce Trade & B2B Exchanges* report, the seventh edition of eMarketer's continuing coverage of business-to-business e-commerce.

This report builds upon past survey data and trends that were examined in the March 2002 *E-Commerce Trade & B2B Exchanges* report – a report that may serve as a complementary reference tool for readers of this latest research.

In addition to our regional coverage of e-business development, this report covers the private e-business initiatives of a handful of leading companies, along with the best practices of ten leading business-to-business exchanges – five of which are independents, and five of which are sponsored by industry consortia.

If you have any questions or comments concerning eMarketer or any of the material in this report, please call, fax or e-mail us.

Steve Butler  
Senior Analyst

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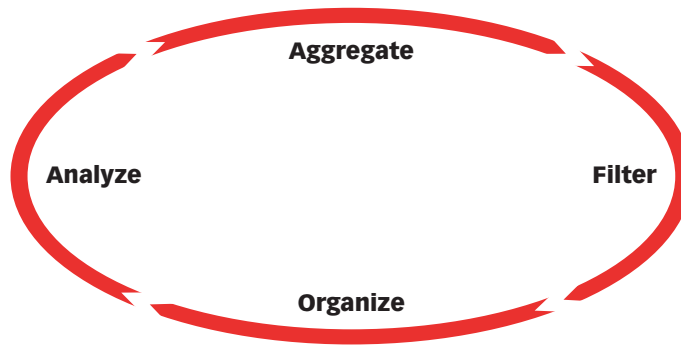
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eMarketer’s approach to market research is founded on a philosophy of aggregating data from as many different sources as possible. Why? Because there is no such thing as a perfect research study and no single research source can have all the answers. Moreover, a careful evaluation and weighting of multiple sources will inevitably yield a more accurate picture than any single source could possibly provide.

## The eMarketer Difference

eMarketer does not conduct primary research. Neither a research firm nor a consultancy, eMarketer has no testing technique to defend, no research bias and no client contracts to protect.

eMarketer prepares each market report using a four-step process of aggregating, filtering, organizing and analyzing data from leading research sources worldwide.



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Using the internet and accessing a library of electronically-filed research reports and studies, the eMarketer research team first aggregates publicly available e-business data from hundreds of global research and consultancy firms. This comparative source information is then filtered and organized into tables, charts and graphs. Finally, eMarketer analysts provide concise and insightful analysis of the facts and figures along with their own estimates and projections. As a result, each set of findings reflects the collected wisdom of numerous research firms and industry analysts.

**“I think eMarketer reports are extremely useful and set the highest standards for high quality, objective compilation of often wildly disparate sources of data. I rely on eMarketer’s research reports as a solid and trusted source.”**

— Professor Donna L. Hoffman, Co-Director, eLab, Vanderbilt University



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## The Benefits of eMarketer's Aggregation Approach

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**Objective:** information is more objective than that provided by any single research source

**Comprehensive:** gathered from the world's leading research firms, consultancies and news organizations

**Authoritative:** quoted in leading news publications, academic studies and government reports

**All in one place:** easy to locate, evaluate and compare

**Readily accessible:** so you can make quick, better-informed business decisions

**Above the hype:** accurate projections that business people can use with confidence

**Time saving:** there's no faster way to find internet and e-business stats, online or off

**Money saving:** more information, for less, than any other source in the world

## "Benchmarking" and Projections

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Until recently, anyone trying to determine which researcher was most accurate in predicting the future of any particular aspect of the internet did not have a definitive source with which to do this. For instance, over 10 firms predicted e-commerce revenues for the fourth quarter 1998 online holiday shopping season, and yet no single source could be identified after the fact as having the "correct" number. In the Spring of 1999, however, the US Commerce Department finally began measuring e-commerce B2C activity so business people and others could have a benchmark with which they could compare and evaluate projections.

eMarketer has adapted its methodology to recognize that certain government and other respected, impartial sources are beginning to provide reliable numbers that can be consistently tracked over time. Most of these established sources, however, only measure past results; typically, they do not make predictions.

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Today, eMarketer formulates its Essential E-Business Numbers by first identifying the most established, reputable source for a given sector being measured and then adopting that organization's figures as *benchmarks* for the historical/current period. For instance, eMarketer's US internet user figures will be based on a combination of the most recent data from the US Census Bureau and the International Telecommunication Union. Using this data as the benchmark for 2000 and 2001, eMarketer will make projections for subsequent years based on the following factors:

- a comparative analysis of user growth rates compiled from other research firms
- additional benchmark data from internet rating firms, e.g., Nielsen//NetRatings, comScore Media Metrix, which use panels to measure internet user activity on a weekly and monthly basis
- an analysis of broader economic, cultural and technological trends in the US

Similarly, US e-commerce revenues are being "benchmarked" using historical data from the US Department of Commerce, and broadband household and penetration rate forecasts are being built off baseline data from the Organization for Economic Cooperation and Development (OECD).

Through this benchmarking process, eMarketer will be holding itself – and our projections – accountable.

**“When I need the latest trends and stats on e-business, I turn to eMarketer. eMarketer cuts through the hype and turns an overabundance of data into concise information that is sound and dependable.”**

— Mark Selleck, Business Unit Executive, DISU e-business Solutions, IBM

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## A. Worldwide E-Business

### Business-to-Business E-Commerce

Among the most comprehensive studies of worldwide business-to-business e-commerce activity, the World Information Technology and Services Alliance (WITSA) has broken down e-commerce trade by country as part of its bi-annual *Digital Planet* report. In partnership with IDC, WITSA has included research data from several leading national IT industry associations, including the ITAA in the United States and JISA in Japan.

Defined by WITSA as “Internet-based business-to-business spending,” worldwide business-to-business e-commerce totaled \$516.2 billion in 2001, an increase of nearly 83% over the estimated \$282.3 billion in business-to-business e-commerce trade that occurred during 2000.

### Worldwide B2B E-Commerce, 1999-2001 (in billions)



Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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As part of eMarketer’s coverage of comparative business-to-business e-commerce estimates, it is worthwhile to note that only three new global forecasts were released during 2002, compared with nine research firms and investment banks that released such forecasts during the height of the business-to-business boom between 2000 and 2001.

Since then, interest in measuring the dollar value of business-to-business e-commerce activity has waned, largely because many companies have changed the way they consider e-commerce trade. Initially, many startup B2B exchanges and software companies, who were often the primary users of this data, believed that their business models would permit them to take a commission off of the dollar value e-commerce trade that might flow through an online marketplace, or occur within a given industry.

But as it became clear that most transaction-based business models would not be able to provide significant revenues, most of the surviving exchanges switched to subscription-based revenue models that rely upon selling flat-fee subscriptions, individual user seats, or charge usage fees based upon the volume of data that is transacted via exchange networks.

As a result, tracking the dollar value of business-to-business e-commerce trade has become less relevant to many data users, while the measurement of network membership, document transfers or productivity gains has become much more important.

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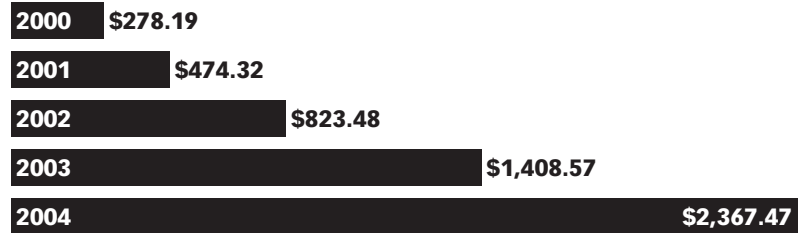
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At the same time, however, government measurement of e-commerce trade has vastly improved. And while the measurement of the dollar value of e-commerce activity has become less relevant to the business models of business-to-business exchanges, measuring the size of e-commerce trade is relevant to those who are interested in understanding the economic impact of e-business technology, such as for those who want to compare the progress that different countries, industries and businesses are making toward improving their productivity.

Of the three new business-to-business e-commerce forecasts that eMarketer tracked during 2002, our own forecast was revised at the beginning of last year, following the mid-2001 release of United States Census Bureau data on US manufacturing and wholesale sector e-commerce trade.

eMarketer has not revised our forecast in early 2003, as we are awaiting the release of the 2002 US Economic Census, which will provide us with new economic data that we will use to adjust our entire worldwide and US economic forecasts. As a result, we expect to revise our business-to-business e-commerce forecasts in early 2004.

**Worldwide B2B E-Commerce Revenues, 2000-2004 (in billions)**



Source: eMarketer, 2002

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By comparison, another 2002 estimate by technology industry research firm INPUT puts worldwide business-to-business e-commerce at \$1.38 trillion by the end of 2003. INPUT includes the Internet-based trade of goods and services in its definition of business-to-business e-commerce, with the exception of financial transactions, such as bank transfers.

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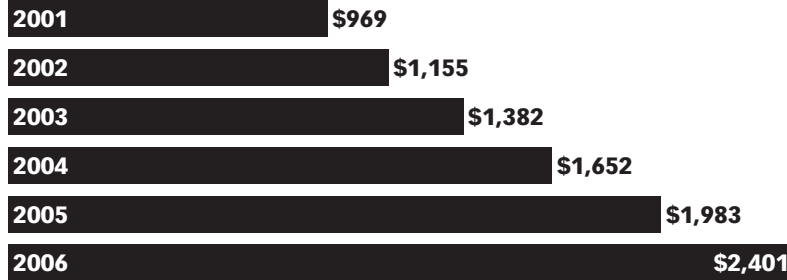
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**Worldwide B2B E-Commerce, 2001-2006 (in billions)**



Source: INPUT, January 2002

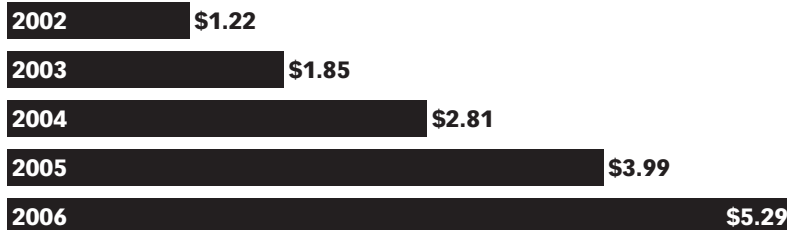
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A third comparative estimate by Computer Economics defines business-to-business e-commerce as Internet-based trade between companies, but includes a broader range of service sector transactions than most other researchers, such as airline tickets and online bill payments.

Computer Economics forecasts that worldwide business-to-business e-commerce will reach \$1.85 trillion by the end of 2003. Looking ahead to 2006, it estimates that businesses will purchase \$5.29 trillion worth of goods and services online in three years' time.

**Worldwide B2B E-Commerce, 2002-2006 (in billions)**



Source: Computer Economics, June 2002

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Taken together, several of the older comparative estimates for worldwide business-to-business e-commerce initially projected a range of between \$858 billion and \$3.69 trillion in Internet-based trade between businesses by the end of 2003.

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It is important to note, however, that definitional differences and variations in individual research firms' economic forecasts account for the discrepancies between these estimates. While they remain of interest as part of the record of past forecasting, most forecasts that were issued prior to 2002 should by now be considered to be out of date.

### Comparative Estimates: B2B E-Commerce Revenues Worldwide, 2000-2005 (in billions)

	2000	2001	2002	2003	2004	2005
AMR Research, 2001	\$371	\$704	\$1,375	\$2,261	\$3,350	\$4,739
Computer Economics, June 2002	-	-	\$1,125	\$1,853	\$2,810	\$3,987
<b>eMarketer, February 2002</b>	<b>\$278</b>	<b>\$474</b>	<b>\$823</b>	<b>\$1,409</b>	<b>\$2,367</b>	-
Forrester Research, April 2000	\$604	\$1,138	\$2,061	\$3,694	\$6,335	-
International Data Corporation (IDC), April 2001	\$282	\$516	\$917	\$1,573	\$2,655	\$4,329
Gartner Group, March 2001	\$433	\$919	\$1,929	\$3,632	\$5,950	\$8,530
Morgan Stanley Dean Witter, April 2000	\$200	\$721	\$1,378	-	-	-
Goldman Sachs & Co., May 2000	\$357	\$740	\$1,304	\$2,088	\$3,201	-
Ovum, 2001	\$218	\$345	\$543	\$858	\$1,400	-

Source: eMarketer, February 2002; various, as noted, 2000-2002

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Among the leading national economies that are supporting business-to-business e-commerce activity, historical data gathered by WITSA indicates that the United States and Japan accounted for 40.1% and 17.6% of global e-commerce activity during 2001, respectively.

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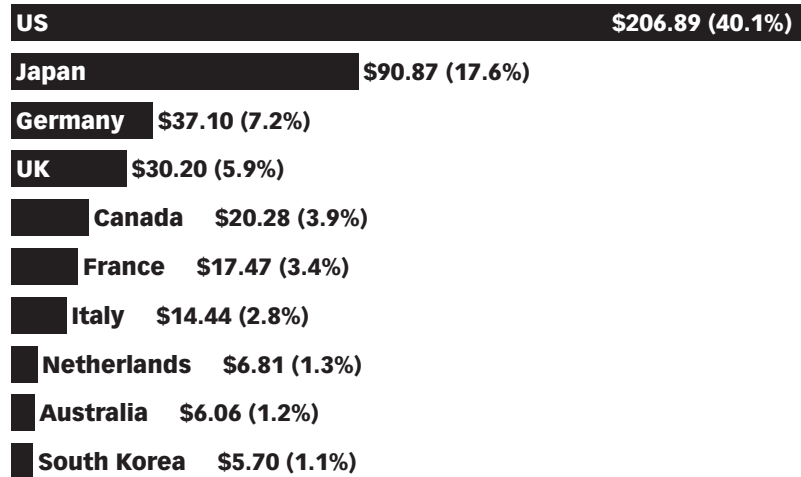
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Taken together, the 10 largest e-commerce economies traded \$435.8 billion in goods online during 2001, accounting for 84.5% of all Internet-based business-to-business e-commerce trade.

### Worldwide B2B E-Commerce Trade, by Country, 2001 (in billions and as a % of worldwide trade)



Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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### E-Business Spending

When it comes to estimating the percent of IT spending that is directed toward e-business initiatives, WITSA and IDC estimate that 17% of worldwide IT spending was directed toward Internet-based technology projects in 2001, up slightly from 15% of IT spending in 2000.

### Worldwide E-Business Technology Spending, 1999-2001 (as a % of IT spending)



Source: World Information Technology and Services Alliance (WITSA), International Data Corporation (IDC), February 2002

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In terms of the dollar value of e-business spending, IT industry research firm INPUT estimates that worldwide spending will grow to \$245 billion by the end of 2003, prior to more than doubling over the next three years to reach \$582 billion by 2006.



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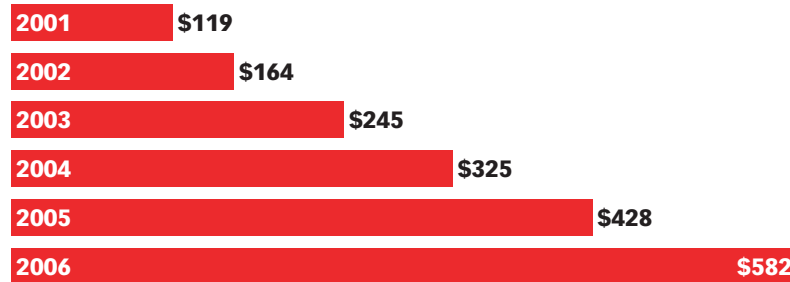
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INPUT includes spending on hardware and software, as well as external services within its definition of e-business spending.

The United States will account for \$170 billion, or 69.3% of global e-business spending in 2003, according to INPUT.

### Worldwide E-Business Technology Spending, 2001-2006 (in billions)



Source: INPUT, January 2002

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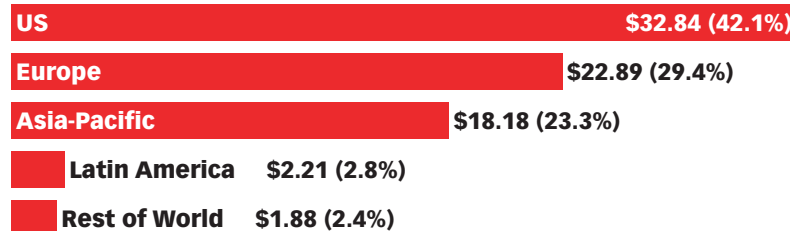
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Compared to INPUT's forecast of \$164 billion in worldwide e-business spending during 2002, Computer Economics estimates that global e-business spending totaled \$78.0 billion at the end of 2002.

Despite its considerably lower estimate, Computer Economics has a broad definition of e-business spending, which includes the cost of hardware and software that is used to enable e-business processes, as well as outside services and internal staff resources that are used to develop or provide e-business processes and applications.

Broken down by regional market, Computer Economics believes that the United States accounted for \$32.8 billion, or 42.1% of worldwide e-business spending in 2002, followed by Europe which spent an estimated \$22.9 billion on e-business technology last year.

### Worldwide E-Business Technology Spending, by Region, 2002 (in billions and as a % of total spending)



Source: Computer Economics, May 2002

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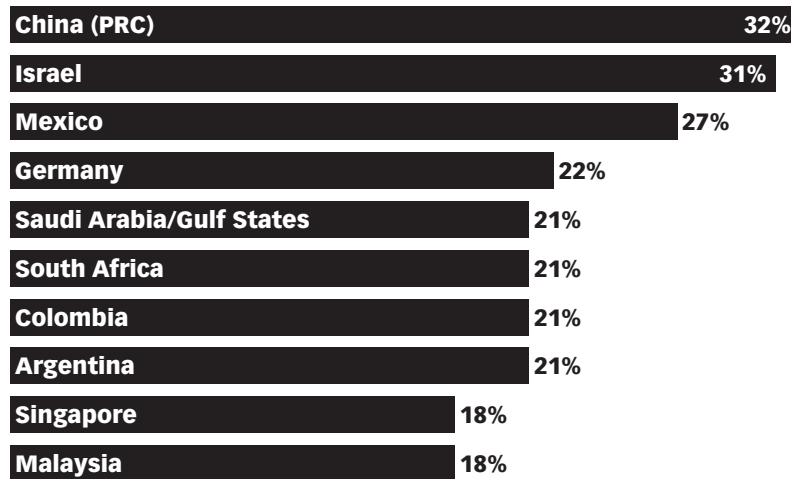
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Taking a look at e-business spending from another perspective, WITSA found that China, Israel and Mexico were the three countries that channeled the greatest portion of their IT spending toward e-business initiatives in 2001.

**Leading E-Business Technology Markets Worldwide, by Country, 2001 (ranked by e-business spending as a % of IT spending)**



Source: World Information Technology and Services Alliance (WITSA), International Data Corporation (IDC), February 2002

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Indeed, eMarketer has found that many developing countries are buying next-generation technology as they play catch up with their American and European counterparts. Furthermore, since most developing countries are starting to build the foundation of their technology infrastructure at a later time than countries in the West, many are able to invest more heavily in new Internet-based infrastructure, while their American and European competitors are still paying to maintain and/or upgrade legacy systems.

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## Stage of E-Business Development

Among those national economies that the Economist Intelligence Unit (EIU) has deemed to be the most e-business ready in 2002, the United States, the Netherlands and the United Kingdom ranked highest on its index list.

Countries were scored using more than 30 variables, as the study considered such factors as telephone penetration rates, online security and intellectual property protection.

According to the survey's authors, the United States came out on top because of "the degree to which the Internet has become embedded in [American] commercial culture."

### Leading E-Business Ready Countries Worldwide, 2002 (ranked by index\* score)

<b>US</b>	<b>8.41</b>
<b>Netherlands</b>	<b>8.40</b>
<b>UK</b>	<b>8.38</b>
<b>Switzerland</b>	<b>8.32</b>
<b>Sweden</b>	<b>8.32</b>
<b>Australia</b>	<b>8.30</b>
<b>Denmark</b>	<b>8.29</b>
<b>Germany</b>	<b>8.25</b>
<b>Canada</b>	<b>8.23</b>
<b>Finland</b>	<b>8.18</b>

Note: \*based upon an index of 1 to 10 where 10=most e-business ready  
Source: Economist Intelligence Unit, July 2002

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Although the study found that countries in North America and Europe had the most developed e-business capabilities, other countries of note include Singapore and Hong Kong in Asia, along with Chile in Latin America and Israel in the Middle East.

By comparison, in what is arguably the most comprehensive study of national technology use to date, the World Economic Forum in partnership with INSEAD and the World Bank released the *Global Information Technology Report 2002-2003* in February 2003, naming Finland, the United States and Singapore as the three most networked economies in the world.

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This detailed report ranks countries according to its Networked Readiness Index, which compares the relative technological preparedness of 82 national economies and their ability to participate in the benefits of information and communications technology (ICT). Using a combination of subjective surveys and hard statistical data to examine each country's technology environment and use of ICT, a total of 64 variables were considered, prior to arriving at a final index score for each country.

**Leading Networked Economies Worldwide, 2002-2003 (ranked by Networked Readiness Index score)**

<b>1. Finland</b>	<b>5.92</b>
<b>2. US</b>	<b>5.79</b>
<b>3. Singapore</b>	<b>5.74</b>
<b>4. Sweden</b>	<b>5.58</b>
<b>5. Iceland</b>	<b>5.51</b>
<b>6. Canada</b>	<b>5.44</b>
<b>7. UK</b>	<b>5.35</b>
<b>8. Denmark</b>	<b>5.33</b>
<b>9. Taiwan</b>	<b>5.31</b>
<b>10. Germany</b>	<b>5.29</b>
<b>11. Netherlands</b>	<b>5.26</b>
<b>12. Israel</b>	<b>5.22</b>
<b>13. Switzerland</b>	<b>5.18</b>
<b>14. South Korea</b>	<b>5.10</b>
<b>15. Australia</b>	<b>5.04</b>

*Note: based upon an index of 1 to 7, where 7 equals most networked*  
*Source: INSEAD, World Economic Forum, February 2003*

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Three main sub-indices were used in this study to examine each national economy, rating a country's technology environment, its readiness to use technology, as well as the current use being made of its technology infrastructure. These three sub-indices were further broken down to examine the activity of three main constituencies – government, business and individuals – as a means of scoring each country's use of ICT.

Within the sub-index that examined current technology use, the component covering business usage surprisingly ranks Germany and Sweden ahead of the United States as the countries where businesses have made the greatest progress in using ICT as part of their regular commercial activity.

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Variables that were considered within this sub-index category include the amount of both business-to-business and business-to-consumer e-commerce activity in each country, as well as businesses' use of online marketing and other Internet-based communications. The study examined technology use among large businesses, as well as small and medium enterprises within each national economy.

### Leading Economies' Business Usage of ICT, 2002-2003 (ranked by Networked Readiness Index score)

<b>1. Germany</b>	<b>6.19</b>
<b>2. Sweden</b>	<b>5.96</b>
<b>3. US</b>	<b>5.95</b>
<b>4. Finland</b>	<b>5.93</b>
<b>5. Iceland</b>	<b>5.58</b>
<b>6. Netherlands</b>	<b>5.51</b>
<b>7. Singapore</b>	<b>5.49</b>
<b>8. UK</b>	<b>5.42</b>
<b>9. Denmark</b>	<b>5.40</b>
<b>10. Switzerland</b>	<b>5.39</b>
<b>11. Norway</b>	<b>5.23</b>
<b>12. South Korea</b>	<b>5.20</b>
<b>13. France</b>	<b>5.14</b>
<b>14. Canada</b>	<b>5.14</b>
<b>15. Hong Kong SAR</b>	<b>5.08</b>

*Note: based upon an index of 1 to 7, where 7 equals most networked*  
*Source: INSEAD, World Economic Forum, February 2003*

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Among the World Economic Forum's most important findings, the study noted that a high level of per capita ICT spending does not necessarily lead to extensive use of technology within any given national economy. Rather, it was found that countries such as Finland, South Korea and Singapore have outperformed other economies, thanks to regulatory environments and government initiatives that encourage the use of ICT among all three major constituencies within their countries.

Taking a slightly different view of the principal drivers behind e-business development, a study conducted by the Center for Research on Information Technology and Organizations (CRITO), found that multinational corporations also play a significant role in bringing e-business technology to countries throughout the world.

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**“...B2B is driven by global competition and multinational corporations that ‘push’ e-commerce to their global suppliers, customers and subsidiaries.”**

– *Kenneth Kraemer, et. al., Center for Research on Information Technology and Organizations*

Compared with business-to-consumer e-commerce, which typically develops as a result of local demand within domestic markets, CRITO discovered that the adoption of business-to-business e-commerce solutions is largely driven by the need for local companies to become more competitive with firms from other countries. Furthermore, smaller firms in developing countries often become e-business ready thanks to their being subsidiaries of larger multinational enterprises, or because of their role within a larger company’s supply chain.

Similar to the World Economic Forum report, CRITO found in its November 2002 study that countries with open regulatory environments that encourage the growth of trade or technology use were the most successful at facilitating the adoption of e-business technology. On the other hand, the CRITO study also found that specific legislation intended to foster the growth of e-commerce was not as effective.

In partnership with IDC, CRITO surveyed more than 2,100 companies from 10 different countries as part its study. The countries represented in the survey include Brazil, China, Denmark, France, Germany, Mexico, Japan, Singapore, Taiwan and the United States.

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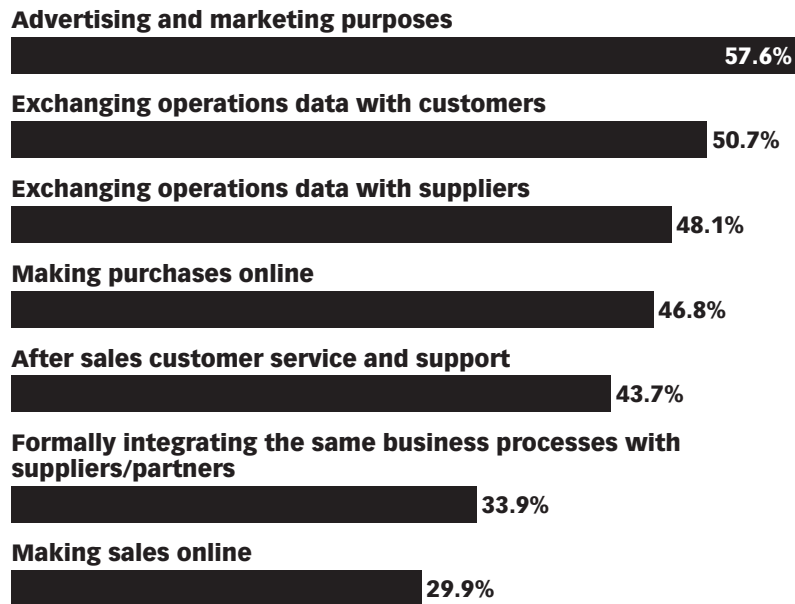
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Among the leading Internet solutions that survey respondents were found to be using, online advertising and marketing solutions were the most common, followed by solutions that permit the online exchange of information with companies' customers and suppliers. However, it should be noted that although half of the survey's respondents said that they used the Internet to exchange information with customers or suppliers, only one-third of respondents said that they had formally integrated their business processes with any of their trading partners.

**Primary Use of the Internet among Companies Worldwide, 2002 (as a % of respondents)**



*Note: n=2,139  
Source: Center for Research on Information Technology and Organizations (CRITO), International Data Corporation (IDC), August 2002*

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Just under 47% of respondents confirmed that they were making purchases via the Internet, with manufacturers channeling an average 6.7% of their direct purchases and 12.2% of their indirect purchases online. Overall, survey respondents from the manufacturing, wholesale/distribution and banking & insurance sectors said that they were channeling an average 6.2% of their entire indirect purchases online.

CRITO uses a broad definition of e-commerce to include the use of the Internet to buy, sell or support products online. Traditional (non-Internet) EDI transactions are excluded from its definition of e-commerce, however.

Taking a closer look at the e-commerce capabilities of companies from around the world, 98.5% of respondents said that they were using e-mail in mid-2002, while 74.1% said that they had a company Web site.

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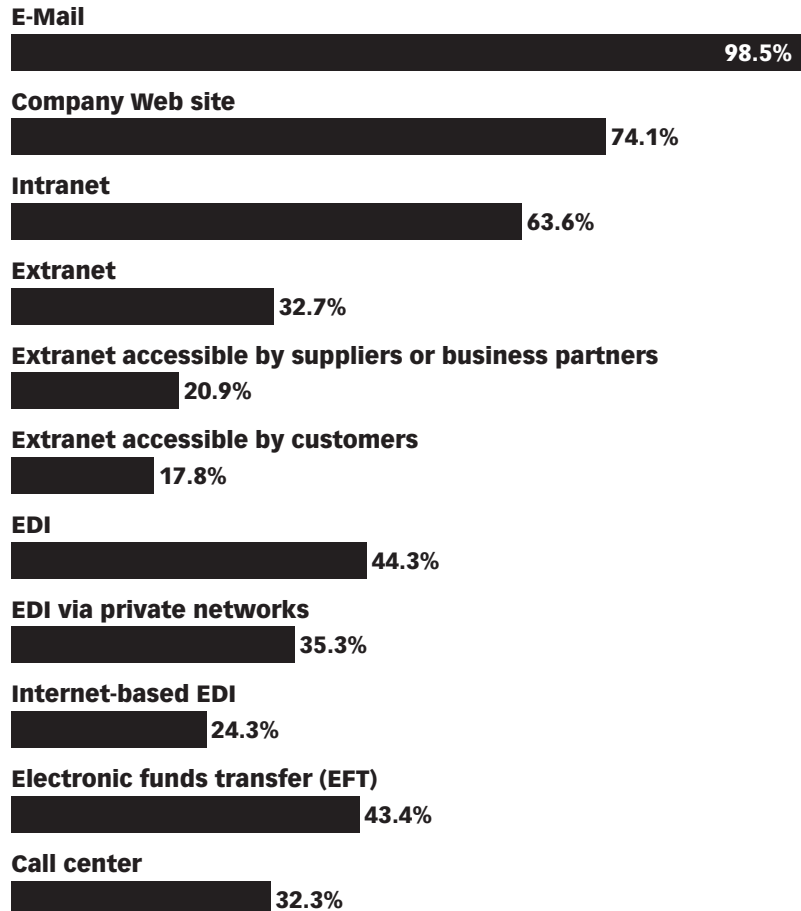
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As for their use of various electronic networks, 44.3% of the businesses surveyed said that they used EDI, while 24.3% said they were using Internet-based EDI. A further 32.7% of respondents confirmed that they operated an extranet, with 20.9% saying that their extranet was accessible by suppliers or business partners, and 17.8% operating an extranet that was accessible to customers.

**Use of E-Commerce Technologies by Companies Worldwide, 2002 (as a % of respondents)**



Note: n=2,139

Source: Center for Research on Information Technology and Organizations (CRITO), International Data Corporation (IDC), August 2002

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Among the leading benefits that businesses said they have experienced from using the Internet, 34.8% of respondents believe that their customer service has improved, while 33.9% of the global companies surveyed said that their internal business processes have been made more efficient.



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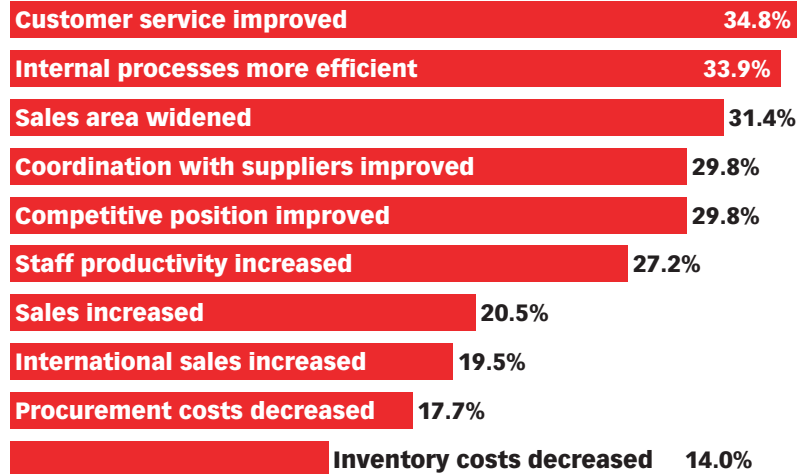
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Perhaps most interestingly, while 31.4% of respondents said that their sales area had widened, just 20.5% of businesses said that their sales had actually increased. A further 19.5% of respondents said that their international sales had increased.

### Leading Benefits from Internet Use According to Companies Worldwide, 2002 (as a % of respondents)



Note: n=2,139

Source: Center for Research on Information Technology and Organizations (CRITO), International Data Corporation (IDC), August 2002

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Focusing on the buy-side of e-business initiatives, the Bordeaux Business School's MAI Institute of International Purchasing surveyed 869 procurement professionals from around the world, finding that most respondents believe that supply chain integration initiatives will produce the greatest returns over the long term, of all online purchasing initiatives.

A further 19% of respondents said that productivity improvements within their company's purchasing operations would produce the most significant returns by 2005.

**E-Procurement Initiatives that Purchasing Professionals Worldwide Believe Will Provide the Greatest Value Add to Their Business in the Next Three Years, 2002 (as a % of respondents)**



Note: n=869

Source: MAI Institute of International Purchasing, September 2002

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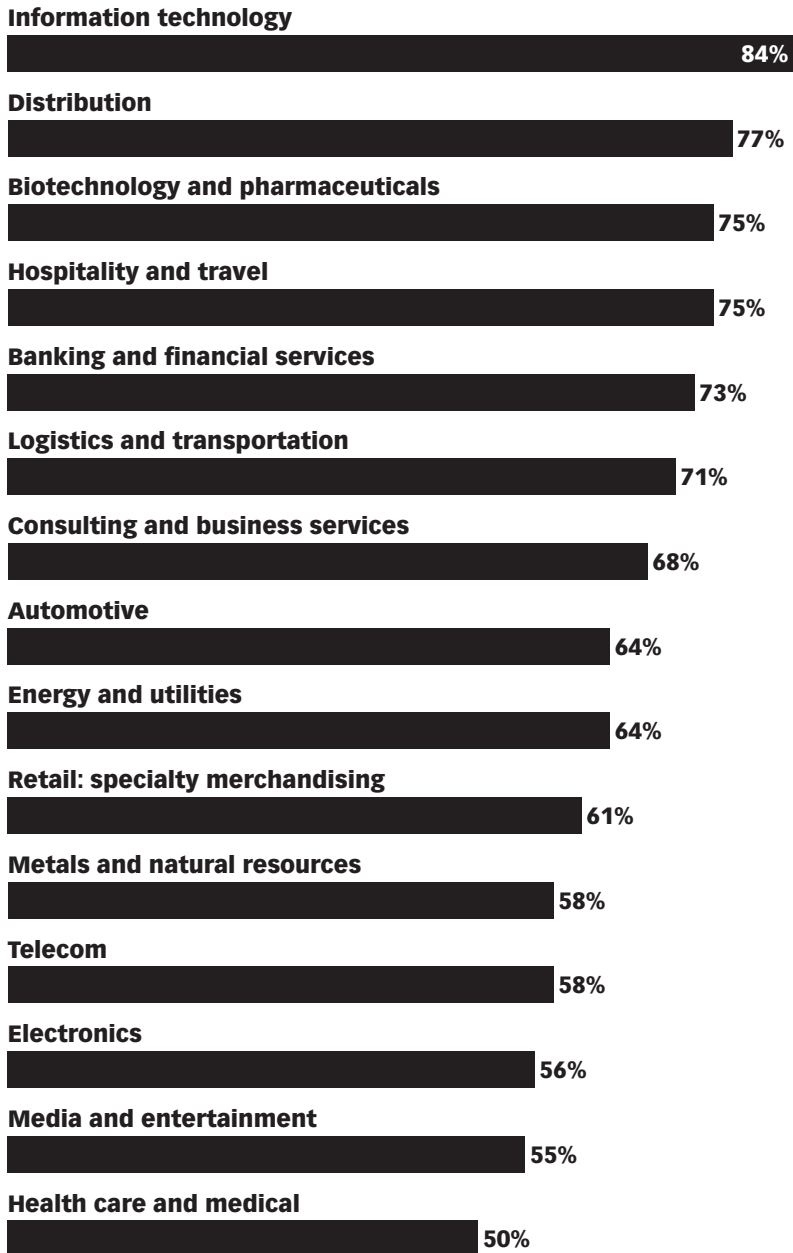
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When it comes to gauging the relative success of e-business operations to date, *InformationWeek* has found that there are significant differences in the degree of success that has been achieved among different industries. For example, while 84% of IT industry firms claim to have profitable e-business operations, just 36% of food and beverage companies are able to make a similar claim.

**InformationWeek 500 Companies that Have Profitable E-Business Operations, by Industry, 2002 (as a % of respondents)**



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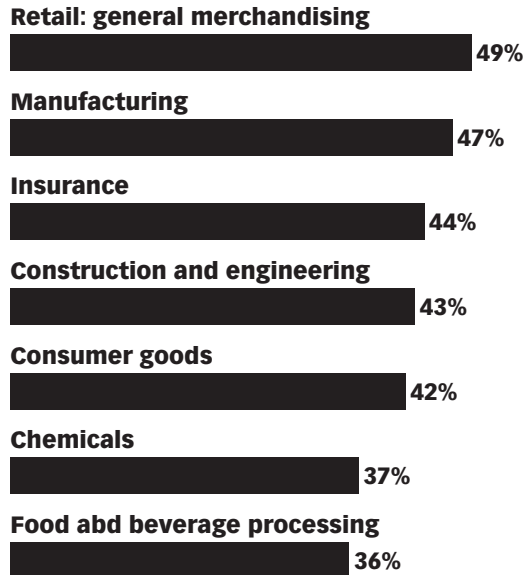
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Source: *InformationWeek, September 2002*

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This divergence may be explained in part by the rate at which different industries have embraced e-business technology. Indeed, eMarketer has found that companies in the information technology and pharmaceutical industries, for example, have been aggressive early adopters of e-business solutions, due in part to their long history of using technology to reduce costs and achieve greater efficiency.

Another factor that explains these differences has to do with the nature of e-business solutions that are being adopted by different industries. Pharmaceutical companies, for example, have been able to see a relatively rapid return on their e-business investments in online marketing solutions, early versions of which they have been able to adopt within a short period of time.

By contrast, a handful of food and beverage processors are in the process of adopting more complex CPFR solutions, which require more time to implement, and require complex collaborative agreements with their retail/distribution industry trading partners.

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## Business-to-Business E-Commerce

According to the World Information Technology and Services Alliance (WITSA) and IDC, business-to-business e-commerce in North America climbed to \$227.2 billion in 2001, up 77.5% from the \$128.0 billion in online trade that occurred during 2000.

### B2B E-Commerce in North America, by Country, 1999-2001 (in billions)

	1999	2000	2001
Canada	\$6.65	\$11.27	\$20.28
US	\$54.22	\$116.75	\$206.89

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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By comparison, eMarketer estimates that US business-to-business e-commerce totaled \$306.1 billion in 2001 and will rise to \$721 billion by the end of 2003.

Significant growth is expected to continue during 2003, with Internet-based trade between businesses forecast to grow by 49.6% this year, compared with growth of 57.4% in 2002.

### US B2B E-Commerce Revenues, 2001-2005 (in billions)

2001	\$306.12
2002	\$481.98
2003	\$720.97
2004	\$1,011.17
2005	\$1,333.02

Source: eMarketer, February 2002

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A comparative estimate by INPUT puts US business-to-business e-commerce at \$591 billion in 2001, and forecasts that online trade between businesses in the United States will increase to \$815 billion by the end of 2003.

**B2B E-Commerce in the US, 2001-2006 (in billions)**



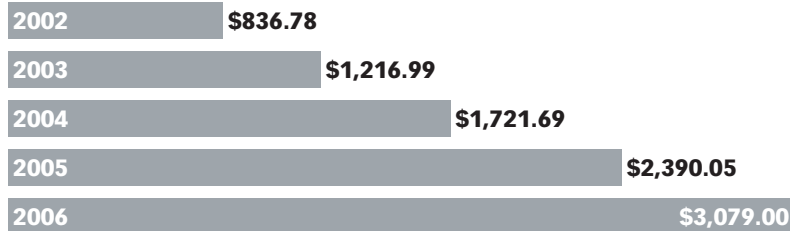
Source: INPUT, January 2002

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A third comparative estimate from Computer Economics predicts that electronic trade between North American companies will reach \$1.2 trillion by the end of 2003, before growing to nearly \$3.1 trillion by 2006.

**B2B E-Commerce in North America, 2002-2006 (in billions)**



Source: Computer Economics, June 2002

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Breaking out EDI-based transactions in the United States by industry, the Giga Information Group estimates that EDI accounted for \$3.24 trillion in electronic trade during 2002, with the manufacturing sector accounting for the largest proportion of EDI trade, at \$665 billion.

### Value of US-Based EDI Transactions, by Industry, 2001-2005 (in billions)

	2001	2002	2003	2004	2005
Chemicals	\$60	\$60	\$63	\$65	\$68
Consumer goods	\$289	\$291	\$302	\$314	\$327
Electronics	\$86	\$87	\$90	\$94	\$98
Food and beverage processing	\$379	\$381	\$396	\$412	\$428
Health care	\$347	\$349	\$432	\$477	\$527
Manufacturing	\$661	\$665	\$690	\$718	\$747
Metals and natural resources	\$414	\$417	\$433	\$450	\$468
Pharmaceuticals and medical	\$171	\$172	\$179	\$186	\$194
Retail and distribution	\$360	\$363	\$376	\$392	\$407
Transportation	\$299	\$301	\$312	\$325	\$338
Utilities	\$161	\$162	\$168	\$175	\$182
<b>Total</b>	<b>\$3,277</b>	<b>\$3,248</b>	<b>\$3,441</b>	<b>\$3,608</b>	<b>\$3,783</b>

Source: Giga Information Group, March 2002

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Like most industry analysts, the Giga Information Group believes that many large corporations will continue to make use of their EDI networks over the next several years, as they choose to slowly retire their legacy systems.

However, there have been a handful of instances where companies have chosen to retire their EDI networks sooner rather than later, thanks to the substantial cost savings that they will be able to achieve through lower data transmission and maintenance fees from the use of Internet-based networks.

Most notable among those firms that have chosen to switch to entirely Internet-based networks is Wal-Mart, which in October of 2002 insisted that all of its suppliers begin trading with it via its private Internet-based exchange.

eMarketer shares a similar view with most industry analysts, that during the next decade, large companies will begin to migrate much of their EDI-based trade over to the Internet. While such changes have been underway in some industries since late 2001, different industries are expected to make the shift to Internet-based networks at their own pace, largely depending upon their competitive environments and the development of Internet-based alternatives to EDI, or traditional offline trading patterns.



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Among the US industries that eMarketer believes will lead this shift are the aerospace and motor vehicles industries. Slower movers include the food & beverage and retail industries, although they each contain a handful of companies that are currently leading the adoption of Internet-based trade.

## US B2B E-Commerce, by Industry, 2001-2005 (in billions)

	2001	2002	2003	2004	2005	% of industry trade 2005
Utilities	\$17.58	\$27.16	\$40.65	\$58.46	\$80.31	10.8%
Food and beverage products	\$17.43	\$26.44	\$39.16	\$56.16	\$77.40	4.2%
Consumer goods	\$18.15	\$28.68	\$43.93	\$64.54	\$90.01	9.5%
Construction materials and wood	\$10.34	\$12.97	\$19.78	\$29.57	\$43.09	4.1%
Paper and office products	\$8.69	\$13.47	\$20.04	\$28.29	\$37.68	5.7%
Energy and petroleum products	\$9.79	\$14.92	\$22.20	\$31.99	\$44.30	4.2%
Chemicals	\$15.72	\$24.21	\$34.81	\$46.45	\$57.83	9.2%
Plastics and rubber products	\$6.81	\$10.86	\$16.58	\$24.05	\$32.91	9.0%
Metals and mining products	\$7.15	\$10.51	\$15.06	\$20.91	\$28.00	4.4%
Industrial equipment and machinery	\$25.71	\$39.66	\$59.25	\$85.05	\$116.64	8.7%
Computers and electronics	\$47.75	\$79.77	\$121.21	\$167.55	\$214.00	10.1%
Aerospace and defense	\$9.17	\$13.70	\$19.09	\$24.69	\$29.79	18.8%
Motor vehicles and parts	\$85.22	\$135.06	\$199.69	\$274.07	\$350.94	18.8%
Healthcare and pharmaceutical products	\$22.05	\$37.82	\$59.95	\$86.42	\$113.34	18.3%
Transportation and warehousing	\$4.56	\$6.74	\$9.57	\$12.98	\$16.78	3.5%
<b>Total</b>	<b>\$306.12</b>	<b>\$481.97</b>	<b>\$720.97</b>	<b>\$1,011.18</b>	<b>\$1,333.02</b>	<b>9.2%</b>

Source: eMarketer, 2002

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For further industry-specific coverage, please see eMarketer's reports for the Consumer Electronics, Pharmaceutical, Automotive and CPG industries, all available at <http://www.emarketer.com/products/reports.php>

Readers should note that the US Census Bureau will be releasing its 2002 Annual Survey of Manufacturers in March 2003, which will include its Electronic Network Use Supplement. eMarketer will be entering these numbers in the eStat Database and including them in our upcoming "North America E-Commerce" report.

Following the release of the 2002 US Economic Census in early 2004, eMarketer will undertake a substantial revision of our US and Worldwide business-to-business e-commerce forecasts.

### E-Business Spending

When it comes to comparing e-business spending forecasts, it is worthwhile to note that these forecasts continue to vary considerably, due in part to the fact that it is almost impossible for technology vendors to break out their product sales by intended customer use. Furthermore, some technologies may have multiple uses that make it difficult to define them as internet-specific, while for many end-users, e-business spending is considered to be a part of their technology spending.

According to WITSA's *Digital Planet 2002* report, the United States and Canada directed 17% and 16% of their total IT spending toward e-business initiatives during 2001, respectively.

#### **E-Business Technology Spending in North America, by Country, 1999-2001 (as a % of IT spending)**

	1999	2000	2001
Canada	9%	13%	16%
US	13%	16%	17%

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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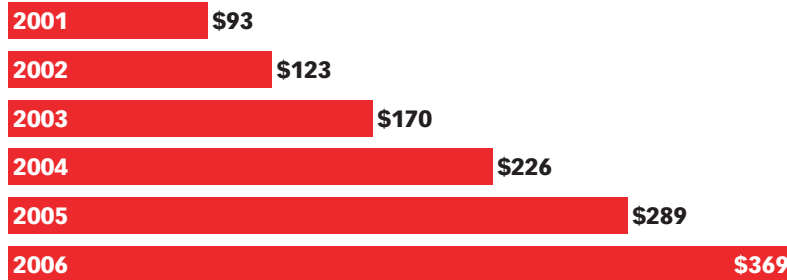
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In dollar terms, research firm INPUT estimates that the United States will spend \$170 billion on e-business technology in 2003, an increase of more than 38% from the \$123 billion that was spent in 2002.

**E-Business Technology Spending in the US, 2001-2006 (in billions)**



Note: CAGR=32%

Source: INPUT, January 2002

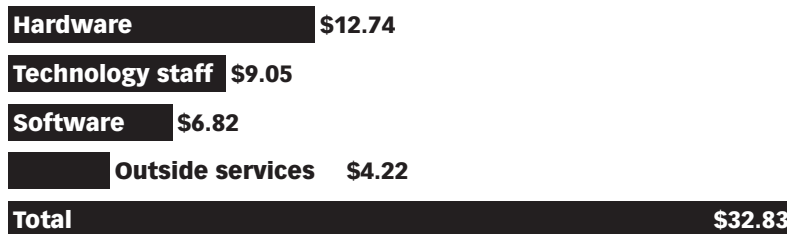
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By comparison, Computer Economics estimates that businesses in the United States spent a total of \$32.8 billion on e-business technology in 2002.

The greatest portion of this spending was directed toward IT hardware, according to Computer Economics, while technology staff accounted for \$9.05 billion of total e-business spending.

**E-Business Spending in the US, by Category, 2002 (in billions)**



Source: Computer Economics, May 2002

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As for those industries that are investing the most in Internet-based technology, the financial services industry spent an estimated \$4.96 billion in 2002, followed by the retail industry at \$4.35 billion and process manufacturing at \$2.3 billion, according to Computer Economics.

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## E-Business Spending in the US, by Industry, 2002 (in billions)

### Financial services

\$4.96

### Retail distribution

\$4.35

### Process manufacturing

\$2.83

### Professional services

\$2.73

### Discrete manufacturing

\$1.87

### Federal government

\$1.83

### Wholesale distribution

\$1.48

### Insurance

\$0.66

### Communications

\$0.64

### Health services

\$0.52

### Transportation

\$0.41

### Utilities

\$0.33

### State and local government

\$0.30

### Construction

\$0.14

### Hotels and lodging

\$0.09

### Natural resources

\$0.02

### Agriculture

\$0.01

Source: *Computer Economics, May 2002*

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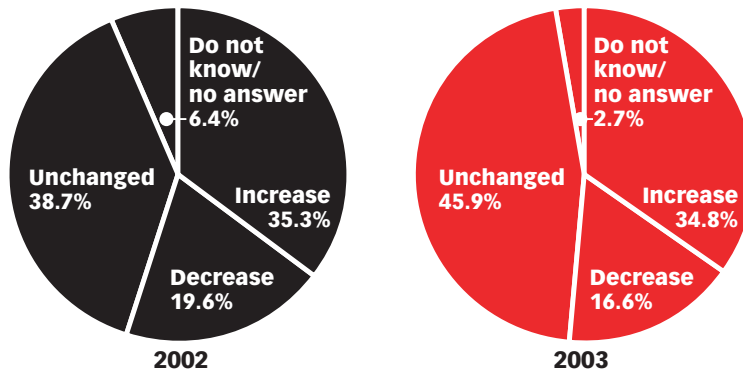
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Looking ahead to 2003, e-business software spending continues to be one of the few areas of most CIOs' IT budgets that will not be cut back. After increasing spending on e-business applications during 2002, a significant 45.9% of respondents to *CIO Magazine* and Deutsche Bank's January 2003 IT spending survey said that they planned to maintain spending levels on e-business applications, while a further 34.8% of CIOs said that they planned to increase spending.

**IT Executives' Planned Spending on E-Business Applications over the Next 12 Months, January 2002 & 2003 (as a % of respondents)**



Note: n=369

Source: *CIO Magazine* and Deutsche Bank, January 2003

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**Stage of E-Business Development**

As a means of gauging American companies' progress with the adoption of e-business solutions and their use of Internet-based procurement, Forrester Research in partnership with the Institute for Supply Management (ISM) has been conducting quarterly surveys of US purchasing executives since the fourth quarter of 2000.

To date, the surveys show that more than 80% of American companies have done at least some form of purchasing online, be it for indirect materials such as office supplies, or direct materials such as chemicals or metal products that are used as inputs for manufactured goods. However, the Forrester/ISM study has also shown that despite the widespread experimentation with Internet-based purchasing, very few businesses have channeled more than 10% of their buying activity online.

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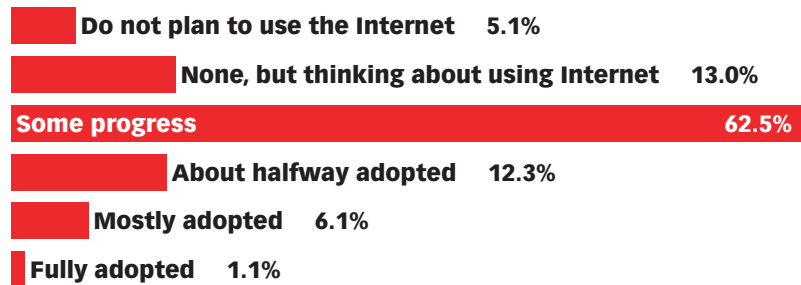
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This may be explained in part by the necessary back-end integration work that many companies must complete, prior to being able to significantly expand their external e-business trading activity. Although several companies were quick to adopt e-procurement systems for indirect materials purchasing, many have seen slower progress in the adoption and integration of more complex supply chain management systems, for example.

Industry groups and individual businesses have also needed time to work out data standards, so that companies may easily exchange information with one another via the Internet. Furthermore, although several enterprises have started by integrating online trading capabilities with their largest trading partners, many smaller companies remain unprepared to trade online, although this situation is slowly improving.

The best way to describe the current situation is to say that progress toward fully integrated business-to-business e-commerce has been slower than originally anticipated, although it continues to steadily move forward. This is confirmed by the Forrester/ISM survey that was taken in December 2002, which found that 75% of respondents were no more than halfway through their implementations of Internet-based purchasing systems, while only 5% of respondents said that they had no intention of using the Internet for procurement.

**Amount of Progress that US Companies Have Made Toward Fully Adopting the Internet for Purchasing Activities, Q4 2002 (as a % of respondents)**



Note: n=294

Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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Quarterly survey data from 2001 and 2002 show that the percent of US businesses using the Internet to purchase indirect goods or services has seen steady growth, increasing to more than 85% of respondents by the end of 2002.

**Percent of US Companies Buying Indirect Goods/Services via the Internet, by Quarter, 2001**

<b>Q1 2001</b>	<b>70.9%</b>
<b>Q2 2001</b>	<b>72.7%</b>
<b>Q3 2001</b>	<b>75.3%</b>
<b>Q4 2001</b>	<b>77.5%</b>

Source: *Institute for Supply Management, Forrester Research, 2001 & 2002*  
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**Percent of US Companies Buying Indirect Goods/Services via the Internet, by Quarter, 2002**

<b>Q1 2002</b>	<b>78.1%</b>
<b>Q2 2002</b>	<b>84.2%</b>
<b>Q3 2002</b>	<b>81.9%</b>
<b>Q4 2002</b>	<b>85.3%</b>

Source: *Forrester Research, Institute for Supply Management (ISM), January 2003*  
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However, American companies' indirect e-procurement as a percent of their total indirect spending has largely stayed within the 9.0% to 10.5% range during the past two years, with online spending showing a decline as the US economy fell into recession.

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This relatively small portion of total indirect spending being channeled online has been attributed in part to integration issues, as well as to complaints about supplier readiness. Integration has been especially difficult for small and medium companies, although it is worth noting that even the most advanced technology users are taking more than one year to roll out new e-procurement systems to hundreds of users company-wide.

**Average Amount of Indirect Goods/Services Purchasing Done via the Internet, by Quarter, 2001 (as a % of total company purchasing)**



Source: Institute for Supply Management, Forrester Research, 2001 & 2002

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**Average Amount of Indirect Goods/Services Purchasing Done via the Internet, by Quarter, 2002 (as a % of total company purchasing)**



Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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Because the procurement of direct materials is more complex and strategically important than the purchase of indirect materials, it is not surprising that there are fewer companies that have begun to channel a significant portion of their direct materials purchasing online.

Many businesses have also needed time to develop technical standards with their trading partners, prior to expanding or even initiating pilot projects designed to facilitate online trade.



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Nonetheless, Forrester and the ISM have found that just over 70% of American companies have at least experimented with some form of purchasing direct materials online as of the fourth quarter of 2002.

**Percent of US Companies Buying Direct Goods/Services via the Internet, by Quarter, 2001**



Source: Forrester Research, Institute for Supply Management (ISM), 2001 & 2002

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**Percent of US Companies Buying Direct Goods/Services via the Internet, by Quarter, 2002**



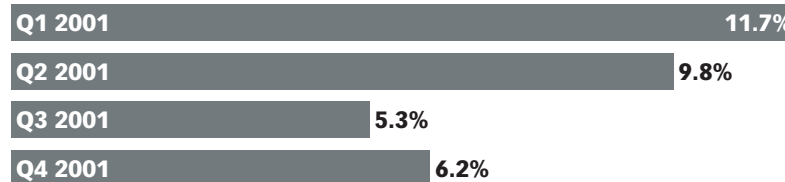
Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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As a percent of total direct materials spending, the Forrester/ISM study has found that American companies have directed less than 7.0% of their total spending online during the toughest quarters of the recent recession, while at their peak, online buyers channeled as much as 11.7% of their spending on direct goods through the Internet. As of the fourth quarter of 2002, Internet-based procurement has rebounded to an average 9.4% of American companies' total direct goods spending.

**Average Amount of Direct Goods/Services Purchasing Done via the Internet, by Quarter, 2001 (as a % of total company purchasing)**



Source: Forrester Research, Institute for Supply Management (ISM), 2001 & 2002

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### Average Amount of Direct Goods/Services Purchasing Done via the Internet, by Quarter, 2002 (as a % of total company purchasing)



Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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It is important to note that much of this online procurement of direct goods has been through the use of eRFPs / eRFQs, or one-time online auction events.

Although such activity confirms businesses' willingness to experiment with the use of the Internet as a purchasing channel, this kind of online procurement requires a much smaller commitment than the truly integrated and more collaborative forms of Internet-based purchasing that come through the use of supply chain management or collaborative planning forecasting and replenishment (CPFR) systems.

The Forrester/ISM data indicates that during 2002, the number of American companies using online RFP and supply chain tools has trended higher, while online marketplace use has remained rather stagnant at just under one third of businesses. Online auction activity, on the other hand, has been somewhat erratic as businesses use Internet auctions for one-time purchase events, after which contracts are often fulfilled through other channels over the course of a specified period.

### US Companies that Have Used the Internet As Part of an RFP Process, by Quarter, 2002 (as a % of respondents)



Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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**US Companies that Collaborate with Suppliers Using Internet-Based Supply Chain Tools, by Quarter, 2002 (as a % of respondents)**



Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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According to Forrester's index of corporate buyers' future interest in using each of these online purchasing solutions, American companies are rather luke-warm about the prospects for online auctions and exchanges. However, interest in the use of online RFQs and supply chain tools appears to have strengthened as of the fourth quarter of 2002.

**US Companies that Have Purchased Goods/Services via an Electronic Marketplace or Private Hub, by Quarter, 2002 (as a % of respondents)**



Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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**US Companies that Have Purchased Goods/Services via an Internet Auction, by Quarter, 2002 (as a % of respondents)**



Source: Forrester Research, Institute for Supply Management (ISM), January 2003

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As confirmation of Forrester’s findings that show a stable interest in online procurement, *Purchasing* magazine discovered in a mid-2002 survey of American purchasing professionals that most companies have not significantly changed their use of various electronic sourcing tools over the past two years.

Although as many as two thirds of respondents to the *Purchasing* survey are continuing to make online purchases with “easy-to-use” e-sourcing tools such as supplier directories and supplier-hosted storefronts, less than 25% of companies are using more complex solutions such as e-commerce enabled extranets to interact with their suppliers.

Once again, however, it is worthwhile to note that this apparent lack of progress is less an indication that businesses have rejected e-commerce, but rather a confirmation that more robust e-business integration requires considerable time and effort.

**US Purchasing Professionals' Use of Electronic Sourcing Tools, by Channel, 2000 & 2002 (as a % of respondents)**

	<b>2000</b>	<b>2002</b>
Supplier directories/databases	73%	74%
Tools for supply base/strategic sourcing research	66%	60%
Supplier-hosted web storefronts	56%	57%
EDI	32%	38%
E-RFQs	30%	34%
Commerce-enabled extranets with select suppliers	25%	23%
E-Collaboration with suppliers	10%	21%
E-Auctions (reverse, buyer controls)	6%	15%
E-Auctions (real time)	9%	11%
E-Auctions (forward, seller controls)	6%	8%
E-Auctions (not real time)	4%	6%
E-Matching (Nasdaq style)	4%	8%
Demand aggregation with other companies	6%	9%

Source: *Purchasing Magazine, June 2002*

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Another study that was conducted by Benchmark Research on behalf of Commerce One found that 61% of US-based Commerce One customers were regularly making purchases from suppliers’ online catalogs. A further 42% of respondents said that they were using e-procurement software to make online purchases, while 38% said they were using online auctions.

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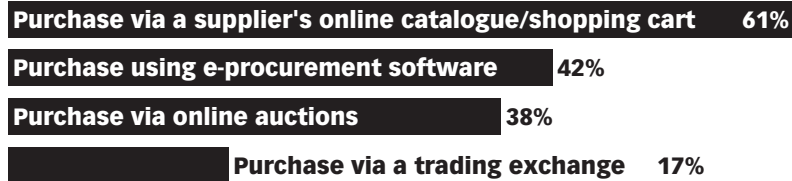
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This study surveyed 150 companies in total, including an additional 50 large enterprises based in the United Kingdom and 50 enterprises that are based in Germany.

### Use of E-Procurement Solutions by Enterprises in the US, by Channel, 2002 (as a % of respondents)



Note: n=50 US enterprises with 5,000+ employees  
Source: Benchmark Research Ltd. for Commerce One, July 2002

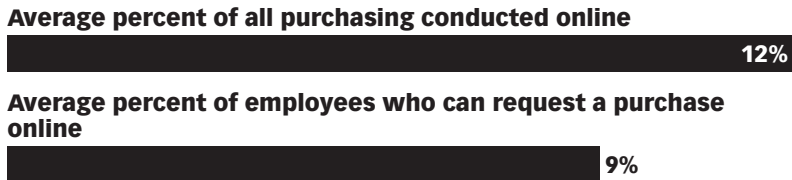
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However, even among this sample group of relatively advanced technology users, just 12% of companies' total purchasing activity was channeled online, according to the Benchmark/Commerce One survey.

On average, 9% of these large enterprises' employees have the ability to request a purchase online.

### Extent of US Enterprises' Use of E-Procurement Solutions, 2002



Note: n=50 US enterprises with 5,000+ employees  
Source: Benchmark Research Ltd. for Commerce One, July 2002

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As for American companies' degree of integration between their e-procurement and core business systems, just 24% of Commerce One users said that they had integrated their e-procurement solutions with their ERP or SCM systems.

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External integration with suppliers was in fact more common, with 40% of respondents confirming that they are able to receive automated price updates from suppliers that go into a vendor database. About one third of companies had integrated their e-procurement systems with a central database of supplier information.

**Integration Level of US Enterprises' E-Procurement Solutions, 2002 (as a % of respondents)**

**E-procurement solution provides an automated format for internal customers to submit requests for purchases**



**E-procurement solution receives regular price update information from suppliers to update vendor database**



**E-procurement technology is linked to extensive central database of supplier information**



**E-procurement solution issues tenders to suppliers electronically and receives bids back in standard format**



**E-procurement system is integrated with ERP/SCM**



Note: n=50 US enterprises with 5,000+ employees  
Source: Benchmark Research Ltd. for Commerce One, July 2002

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In Canada, purchasing professionals are not unlike their American counterparts when it comes to their widespread use of simple e-procurement solutions, such as those that let them search supplier databases or view suppliers' catalogs online.

According to the Purchasing Management Association of Canada's (PMAC) survey of 173 Canadian purchasing professionals, just under half of respondents said that their companies were using online RFQs/RFPs as of mid-2002, while only 8% were participating in online auctions.

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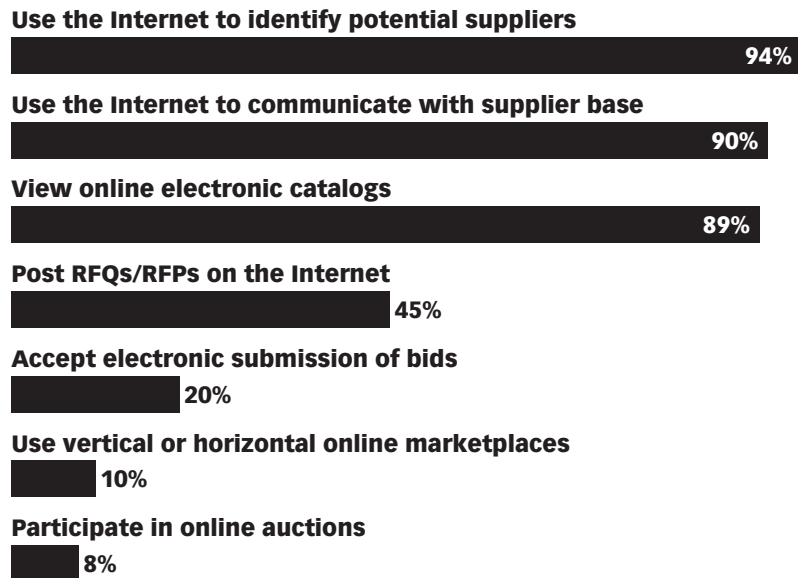
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This compares with 68.4% of American companies that used online RFQs/RFPs and 27.2% of US companies that used an online auction during the fourth quarter of 2002, according to the Forrester Research/ISM survey of American purchasing professionals.

**Canadian Procurement Professionals' Use of E-Procurement Solutions, by Channel, 2002 (as a % of respondents)**



*Note: n=173 purchasing professionals*  
*Source: Purchasing Management Association of Canada, The Conference Board of Canada, May 2002*

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Canadian companies are still channeling small portions of their overall purchasing activity online, which is similar to their US counterparts.

Surprisingly though, the PMAC study noted a decline in online trade between its 2000 and 2002 surveys. Although this decline may be a result of a statistical variation, it does confirm that online purchasing has certainly not increased over the past two years.

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On the other hand, the study's authors point out that respondents to the 2002 survey expect that, on average, 35% of their total trade will be channeled online by 2005, indicating that as in the United States, the build-out of e-commerce capabilities is continuing, albeit at a slow pace.

### Percent of Canadian Companies' Total Purchasing Conducted via the Internet, 2000 & 2002



*Note: n=173 purchasing professionals surveyed in 2002*  
*Source: Purchasing Management Association of Canada, The Conference Board of Canada, May 2002*

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The PMAC study found that among the most popular products that Canadian companies are purchasing online, 42% of survey respondents listed office supplies, furniture and equipment as their top product category, followed by 29% of respondents who frequently purchase IT equipment, hardware and software online. Less than 20% of respondents said that they purchase other indirect goods or direct goods online.

The PMAC study also discovered that 36% of Canadian respondents use an ERP system, while 32% of the surveyed Canadian companies are using an extranet as of mid-2002. Looking forward to 2004, 64% of respondents said that they expect to be using an extranet or ERP system as part of their procurement operations by then.

Just under half of Canadian purchasing professionals, at 44% of respondents, said that online procurement was one of their companies' top ten strategic priorities.

The most significant finding of this survey, however, reveals that a substantial 82% of Canadian organizations said they do not request that prospective suppliers offer their products or services online, while 79% said that they do not give their current suppliers any incentives or encouragement to sell online either.

As mentioned in the previous chapter, one of the key drivers of e-business development is the leadership of large enterprises, which play a crucial role in encouraging the adoption of e-business technology throughout their own organization, as well as their supply chains. Data from the PMAC survey indicates that businesses in Canada are not as proactive as they could be at encouraging e-business adoption among their trading partners, which may in turn explain why Canadian companies trail their American counterparts in the use of various e-procurement tools.

This might further explain Canada's scoring in the World Economic Forum's Network Readiness Index. Although Canada ranked sixth overall, thanks in part to strong government support of e-business technology, Canada ranked 14th overall within the business usage index,



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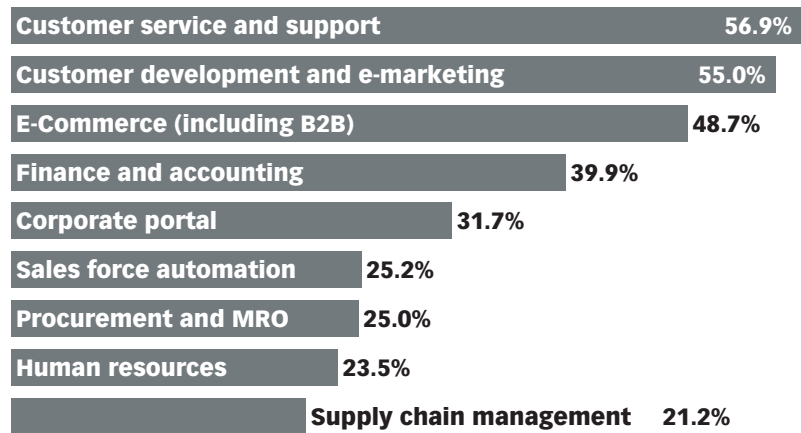
which considers businesses' adoption of e-commerce and related e-business solutions.

In light of the role that the Canadian government has already played in encouraging e-business development, the above findings indicate that Canadian businesses need to do a better job of stepping up and promoting e-business development themselves – both within their own organizations, and throughout their supply chains.

Taking a broader look that includes buy-side and sell-side operations, the *Net Impact Study Canada* found that the most popular e-business solutions that have been adopted by Canadian small and medium enterprises (SMEs) include customer service and support applications, followed by Internet-based marketing solutions.

The *Net Impact Study Canada* has also found that as of late 2002, 48.7% of Canadian SMEs were using an e-commerce solution of some kind, while just 21.1% were making use of supply chain management technology.

**Leading E-Business Solutions Used by Canadian SMEs, 2002 (as a % of respondents)**



*Note: n=398; small and medium enterprises defined as having between 50 and 500 full-time employees*

*Source: Net Impact Study Canada, November 2002*

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Surprisingly, when broken down by industry, government was the most likely economic sector to be using supply chain management solutions, followed by the communications industry, and well-ahead of the manufacturing sector.

As for e-commerce systems, the wholesale/retail sector was the most likely to be using such solutions, with 67.3% of respondents having adopted such technology.

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Similarly high numbers of SMEs were making use of online customer development and e-marketing solutions, at about two thirds of respondents from the wholesale/retail, communications/ISP and financial services sectors.

**Canadian SMEs Adopting E-Business Solutions, by Industry, 2002 (as a % of respondents)**

	<b>Manu- facturer</b>	<b>Financial services</b>	<b>Wholesale/ retail trade</b>	<b>Commu- nication and ISP</b>	<b>Public sector</b>
Customer develop- ment and e-marketing	38.5%	63.5%	68.8%	63.6%	55.8%
Customer service and support	40.4%	71.0%	62.5%	54.2%	68.2%
E-Commerce (including B2B)	42.5%	38.7%	67.3%	45.5%	39.5%
Finance and accounting	35.8%	58.1%	33.3%	35.7%	51.2%
Human resources	13.5%	25.8%	16.7%	43.6%	37.2%
Procurement and MRO	30.8%	19.4%	22.9%	20.0%	23.3%
Sales force auto- mation	25.0%	30.2%	34.7%	25.5%	9.3%
Supply chain management	17.3%	22.6%	18.8%	25.2%	30.2%
Corporate portal	11.5%	50.8%	32.7%	67.3%	44.2%

*Note: n=398; small and medium enterprises defined as having between 50 and 500 fulltime employees*

*Source: Net Impact Study Canada, November 2002*

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## Business-to-Business E-Commerce

According to the World Information Technology and Services Alliance (WITSA) and IDC, business-to-business e-commerce among the 10 leading online economies of Western Europe increased to \$128.9 billion in 2001, up from \$53.0 billion in 2000.

Other countries with significant e-commerce trade that lie outside of the top ten include Norway, Belgium and Finland, which generated \$3.2 billion, \$2.8 billion and \$2.0 billion in business-to-business e-commerce trade during 2001, respectively.

### B2B E-Commerce in Western Europe, by Country, 1999-2001 (in billions)

	1999	2000	2001
Germany	\$5.78	\$15.17	\$37.10
UK	\$5.52	\$13.82	\$30.20
France	\$1.87	\$6.17	\$17.47
Italy	\$1.56	\$5.54	\$14.44
Netherlands	\$0.81	\$2.73	\$6.81
Spain	\$0.57	\$2.00	\$5.37
Switzerland	\$0.86	\$2.29	\$5.32
Sweden	\$0.95	\$2.36	\$5.27
Denmark	\$0.55	\$1.47	\$3.57
Austria	\$0.65	\$1.49	\$3.41

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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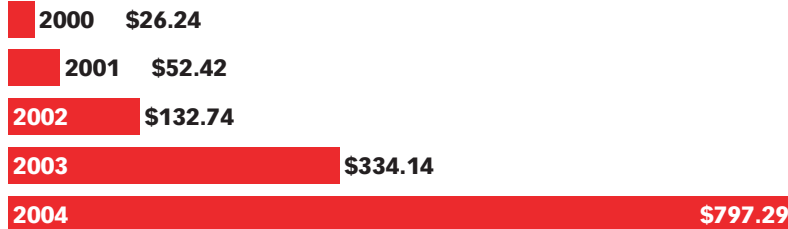
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Although WITSA's *Digital Planet 2002* report included coverage of IT and telecommunications spending in Eastern Europe, the study was unable to produce estimates of e-commerce activity within any Eastern European country, including the region's most notable economies of Russia, Poland, Hungary and the Czech Republic.

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According to eMarketer's 2002 forecast, business-to-business e-commerce in Western Europe is expected to reach \$334.1 billion by year's end.

**B2B E-Commerce Revenues in Europe, 2000-2004 (in billions)**



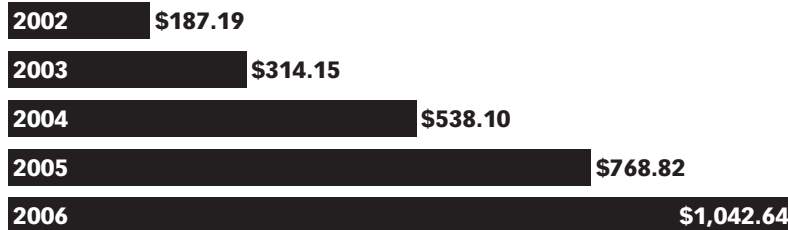
Source: eMarketer, 2001

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By comparison, using a broader definition that includes online sales of business services such as travel and financial expenditures, Computer Economics estimates that business-to-business e-commerce in Europe will grow by 67.8% in 2003 to reach \$314.1 billion by year's end.

**B2B E-Commerce in Europe, 2002-2006 (in billions)**



Source: Computer Economics, June 2002

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A third comparative estimate by Forrester Research predicts that online trade in the European Union will grow from EUR 77 billion (USD 85.1 billion) in 2001 to reach EUR 2.2 trillion (USD 2.3 trillion) by 2006.

**Online Trade in Europe, 2001 & 2006 (in billions of € and as a % of total business trade)**



Source: Forrester Research, August 2002

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As a percent of total online and offline commercial activity, e-commerce sales are expected to increase from just 1% of all business trade in 2001 to 22% of EU trade in three years' time. Businesses in the United Kingdom, Germany and France will direct an average 23% of their commercial activity online, according to Forrester, while these three countries together will account for 64% of the EU's total e-commerce trade.

**“The rapid growth and high volume of Internet-based trade in France, Germany and the UK will pressure proximate countries with deep trading relationships – like Belgium, Austria and Ireland – to accelerate their migration to the Net.”**

– David Metcalfe, Forrester Research

Citing relative levels of EU members' investment in IT infrastructure, Forrester believes that the Scandinavian countries will lead other EU members in the percentage of commercial activity that they will be able to channel online over the next several years, while southern European countries are expected to be laggards.

For example, Forrester estimates that e-commerce as a portion of total business spending will stay relatively low in Italy during 2003, at 2.2% of total online and offline commercial activity. By comparison, Sweden is expected to channel more than 13% of its total business-to-business trade online in 2003.

Like Italy, Greece and Portugal are expected to bring relatively small portions of their total trade online as well, with neither country projected to send more than 10% of its business-to-business commercial activity online by 2006.

Taking a closer look at industry-specific trade, Forrester believes that by 2004, the European manufacturing sector will conduct EUR 945 billion (USD 1.0 trillion) in online trade, or 9.9% of total business trade in the region. Of the leading verticals within this sector, the electrical equipment industry is expected to channel 11.7% of its sales online in 2003, up from 4.3% in 2002.

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## E-Business Spending

According to data gathered by WITSA and IDC, Germany leads all Western European countries in the proportion of IT spending that is directed toward e-business, or Internet-based initiatives. Furthermore, all of the top 10 countries spent at least 10% of their IT dollars on e-business in 2001.

Other countries of note include the Netherlands, which also directed 10% of its IT spending toward Internet initiatives, followed by Greece, Italy and Belgium, each of which spent an estimated 9% of their IT budgets on e-business. WITSA estimates that Sweden directed 7% of its IT spending toward e-business in 2001, while Denmark channeled 6% of its IT dollars toward Internet initiatives.

### E-Business Technology Spending in Western Europe, by Country, 1999-2001 (as a % of IT spending)

	1999	2000	2001
Germany	17%	21%	22%
Ireland	9%	12%	16%
Norway	11%	13%	15%
Spain	7%	9%	14%
Switzerland	9%	12%	14%
UK	9%	12%	14%
Portugal	10%	12%	13%
France	8%	10%	11%
Austria	6%	7%	10%
Finland	6%	7%	10%

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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Perhaps surprisingly, many Eastern European countries were found to be directing similar, if not higher, proportions of their IT budgets toward e-business initiatives when compared with their Western European counterparts.

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As mentioned in the first chapter, however, several of these modernizing economies have recently begun to lay the foundation of their technology infrastructure at a later time than their counterparts in the West. As a result, they are able to invest more heavily in new Internet-based infrastructure, while their American and European competitors must still direct a significant portion of their IT dollars toward maintaining or upgrading legacy IT systems.

**E-Business Technology Spending in Eastern Europe, by Country, 1999-2001 (as a % of IT spending)**

	<b>1999</b>	<b>2000</b>	<b>2001</b>
Czech Republic	11%	15%	18%
Hungary	11%	15%	18%
Poland	11%	15%	18%
Slovenia	11%	15%	18%
Bulgaria	7%	8%	10%
Romania	7%	8%	10%
Russia	7%	8%	10%
Slovakia	7%	8%	10%
Other Eastern European countries	7%	8%	10%

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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As for the dollar value of e-business spending in Western Europe, Computer Economics estimates that companies spent \$22.9 billion on e-business initiatives in 2002, with nearly half of that spending being directed toward hardware.

**E-Business Spending in Europe, by Category, 2002 (in billions)**

<b>Hardware</b>	<b>\$10.69</b>
<b>Technology staff</b>	<b>\$6.59</b>
<b>Software</b>	<b>\$3.27</b>
<b>Outside services</b>	<b>\$2.36</b>
<b>Total</b>	<b>\$22.90</b>

Source: Computer Economics, May 2002

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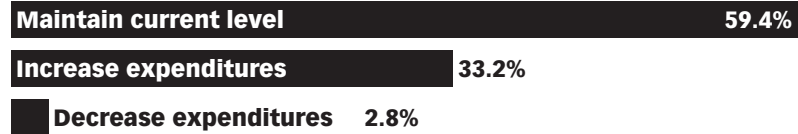
Looking ahead to e-business spending plans through the first half of 2003, E-Business Watch found that just under 60% of the companies it spoke with planned to maintain their current levels of e-business software spending as of mid-2002.



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A further 33.2% of companies said that they planned to increase their e-business spending heading into 2003, while a narrow 2.8% of respondents indicated that they would decrease spending on Internet-based initiatives.

### European\* Businesses' Planned Spending on E-Business Solutions over the Next 12 Months, July 2002 (as a % of respondents)



Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK  
 Source: e-Business W@tch, October 2002

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### Stage of E-Business Development

According to the Economist Intelligence Unit's (EIU) ranking of European countries' e-business readiness, the Netherlands, the United Kingdom, Switzerland and Sweden scored the highest.

The EIU ranked 60 countries from around the world, using an index that considered 30 variables to arrive at a final index score. Such variables include each country's overall business and regulatory environment, the social and cultural infrastructure of each country, as well as consumer and business adoption levels of e-business and information technology.

### Leading E-Business Ready Countries in Western Europe, 2002 (ranked by index\* score)

Netherlands	8.40
UK	8.38
Switzerland	8.32
Sweden	8.32
Denmark	8.29
Germany	8.25
Finland	8.18
Norway	8.17
Austria	8.10
Ireland	8.02

Note: \*based upon an index of 1 to 10 where 10=most e-business ready  
 Source: Economist Intelligence Unit, July 2002

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An even more comprehensive study conducted by the World Economic Forum in partnership with INSEAD and the World Bank listed Finland, the United States and Singapore as the three most networked economies in the world.

A total of 64 variables were considered in this study, which used three sub-indices to evaluate the level of e-business development in 82 countries. Within each sub-index, separate scores were assigned to three major constituents within each country's national economy – individuals, businesses and government.

Taking a closer look at the study's Business Usage sub-index, businesses in Germany, Sweden and Finland scored the highest in terms of their current use of the Internet as of 2002. Among the factors considered for this sub-index were each country's level of business-to-consumer and business-to-business e-commerce activity, as well as the extent to which businesses were using the Internet for online marketing and other communications.

### Leading Western European Economies' Business Usage of ICT, 2002-2003 (ranked by Networked Readiness Index score)

<b>1. Germany</b>	<b>6.19</b>
<b>2. Sweden</b>	<b>5.96</b>
<b>4. Finland</b>	<b>5.93</b>
<b>5. Iceland</b>	<b>5.58</b>
<b>6. Netherlands</b>	<b>5.51</b>
<b>8. United Kingdom</b>	<b>5.42</b>
<b>9. Denmark</b>	<b>5.40</b>
<b>10. Switzerland</b>	<b>5.39</b>
<b>11. Norway</b>	<b>5.23</b>
<b>13. France</b>	<b>5.14</b>

*Note: based upon an index of 1 to 7, where 7 equals most networked; ranking based on 82 economies included in study*

*Source: INSEAD, World Economic Forum, February 2003*

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As for the EIU's scoring of Eastern European countries' e-business readiness, the Czech Republic, Hungary and Poland scored the highest, ranking 27<sup>th</sup>, 29<sup>th</sup> and 31<sup>st</sup> respectively, out of the 60 countries that were surveyed worldwide.

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Russia and Ukraine registered the lowest scores among Eastern European countries, ranking 45<sup>th</sup> and 54<sup>th</sup>, respectively.

### Leading E-Business Ready Countries in Eastern Europe, 2002 (ranked by index\* score)

<b>Czech Republic</b>	<b>6.45</b>
<b>Hungary</b>	<b>6.05</b>
<b>Poland</b>	<b>5.52</b>
<b>Slovakia</b>	<b>5.00</b>
<b>Bulgaria</b>	<b>4.25</b>
<b>Romania</b>	<b>4.00</b>
<b>Russia</b>	<b>3.93</b>
<b>Ukraine</b>	<b>3.05</b>

Note: \*based upon an index of 1 to 10 where 10=most e-business ready  
Source: Economist Intelligence Unit, July 2002

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Similar results were posted in the World Economic Forum study, which assigned the Czech Republic a ranking of 28<sup>th</sup> overall within its broad Networked Readiness Index. Hungary ranked 30<sup>th</sup> out of the 82 countries that were surveyed, and Poland ranked 39<sup>th</sup>. Russia and Ukraine were at the bottom of the Networked Readiness Index, coming in at 69<sup>th</sup> and 70<sup>th</sup> overall.

Within the Business Usage sub-index, Poland, the Czech Republic and Estonia had the highest scores, with Slovenia ranking a respectable 37<sup>th</sup> overall.

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Business network use in Hungary was particularly low at 54<sup>th</sup> overall, especially when compared with Hungary's higher rankings for individual and government use. Ukraine was ranked 75<sup>th</sup> in the Business Usage sub-index, slightly ahead of Russia which ranked 81<sup>st</sup> out of 82 countries' business usage scores.

### Leading Eastern European Economies' Business Usage of ICT, 2002-2003 (ranked by Networked Readiness Index score)

<b>25. Poland</b>	<b>4.72</b>
<b>27. Czech Republic</b>	<b>4.71</b>
<b>31. Estonia</b>	<b>4.35</b>
<b>37. Slovenia</b>	<b>3.94</b>
<b>41. Croatia</b>	<b>3.74</b>
<b>44. Slovak Republic</b>	<b>3.63</b>
<b>50. Latvia</b>	<b>3.48</b>
<b>54. Hungary</b>	<b>3.43</b>
<b>75. Ukraine</b>	<b>2.72</b>
<b>78. Lithuania</b>	<b>2.55</b>

*Note: based upon an index of 1 to 7, where 7 equals most networked; ranking based on 82 economies included in study*  
*Source: INSEAD, World Economic Forum, February 2003*

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As part of the European Commission's effort to better understand how businesses in Europe are using the Internet for their day-to-day operations, E-Business Watch conducted a survey of more than 10,000 IT managers at companies from across the European Union in June and July of 2002. A total of 15 industry sub-sectors were surveyed, with an average sample of 100 companies per sub-sector surveyed in each country.

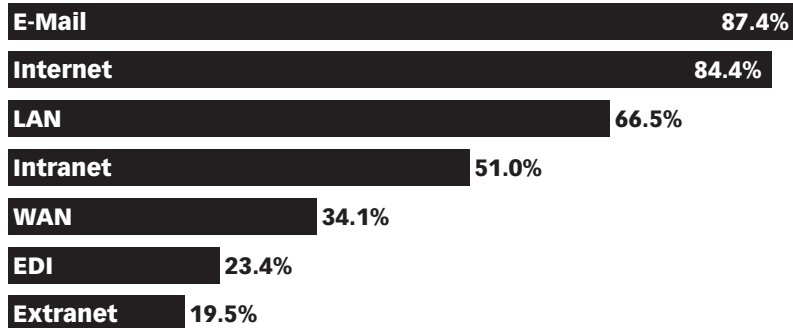
The study's top-level results were broken out to include the EU-4 - Germany, France, Italy and the UK - which typically account for 60% to 70% of all trade within any given industry that was polled.

Among the study's findings, E-Business Watch discovered that as of mid-2002, 84.4% of all companies in the EU-4 had Internet access, while 23.4% of respondents used EDI networks, and 19.5% used an extranet.

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EDI use was most common among transport equipment and chemicals manufacturers, where 50.6% and 39.5% of respondents said they used such networks, respectively. More than half of telecommunications and computer services companies used extranets, with 54.3% of respondents from that industry confirming they did so.

**European\* Businesses' Uses of Electronic Networks, by Channel, 2002 (as a % of respondents)**



*Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK*  
*Source: e-Business W@tch, July 2002*

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Among those firms that have access to an electronic network, 46.6% said that they are able to exchange documents with suppliers, while 45.1% of respondents said that they electronically exchange documents with customers.

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Not surprisingly, for those e-business solutions that require a greater degree of integration, less than 15% of respondents said their companies were engaged in some form of electronic collaborative demand forecasting, while 20.2% said they were using an electronic collaborative design solution with their business partners.

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### European\* Businesses' Uses of E-Business Technologies, 2002 (as a % of respondents)

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#### Electronically exchange documents with suppliers

46.6%

#### Electronically exchange documents with customers

45.1%

#### Online collaborative design with business partners to design products

20.2%

#### Online management of capacity/inventory

16.3%

#### Online negotiation of contracts

15.5%

#### Online collaboration to forecast product demands

14.9%

*Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK*

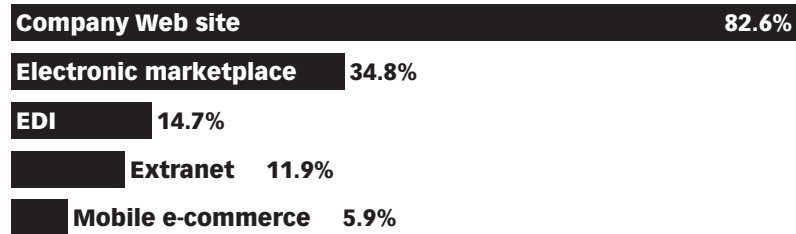
*Source: e-Business W@tch, October 2002*

When it comes to selling online, 82.6% of businesses in the EU-4 said that they were selling goods or services via their company Web site. It should be noted however, that this survey included businesses that sell to consumers, in addition to those companies that sell to other businesses.

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Indeed, among those electronic channels that are primarily intended for access by other businesses, about one third of companies sold goods electronically through online marketplaces, while less than 15% of companies were selling products via EDI.

### European\* Businesses' Uses of Electronic Networks for Online Sales, by Channel, 2002 (as a % of respondents)



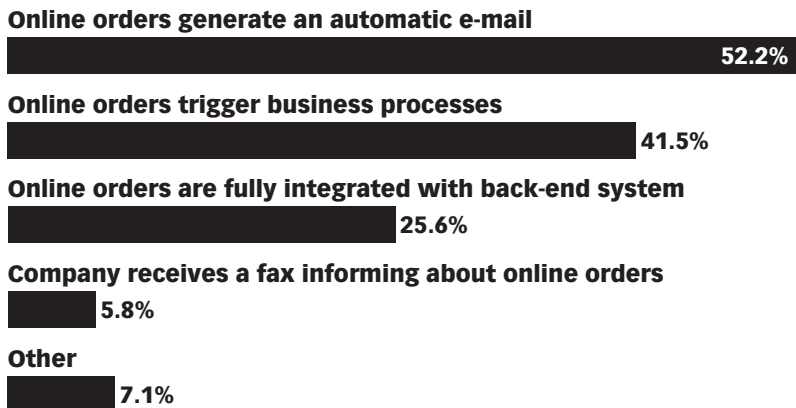
Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK  
 Source: e-Business W@tch, October 2002

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Only 25.6% of respondents had fully integrated their online ordering systems with their back-end systems, confirming that most companies' e-commerce capabilities remain at a rather early stage in their development. Instead, 52.2% of survey respondents said that online orders generate an automatic e-mail, while 41.5% of companies' online orders trigger a business process.

### European\* Businesses' Methods of Processing Online Orders, 2002 (as a % of respondents)



Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK  
 Source: e-Business W@tch, October 2002

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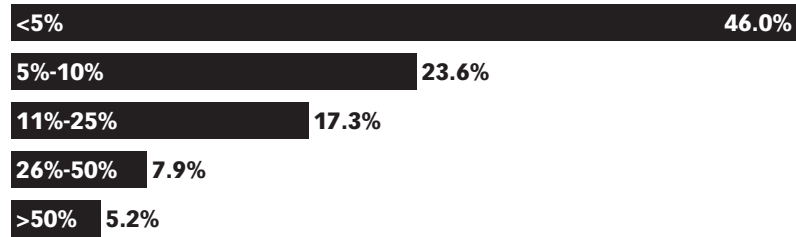
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On the buy-side of their operations, 42.7% of European companies said that they were making some purchases online, while an additional 6.8% of businesses planned to do so within the next 12 months.

However, not unlike their counterparts in the United States and Canada, of those companies that were making online purchases, nearly 70% of respondents were channeling less than 10% of their overall purchasing via the Internet. A narrow 5.2% of respondents said that they were doing more than 50% of their total purchasing online.

**Share of European\* Businesses' Total Purchasing Activity Conducted Online, 2002 (as a % of respondents)**



*Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK*

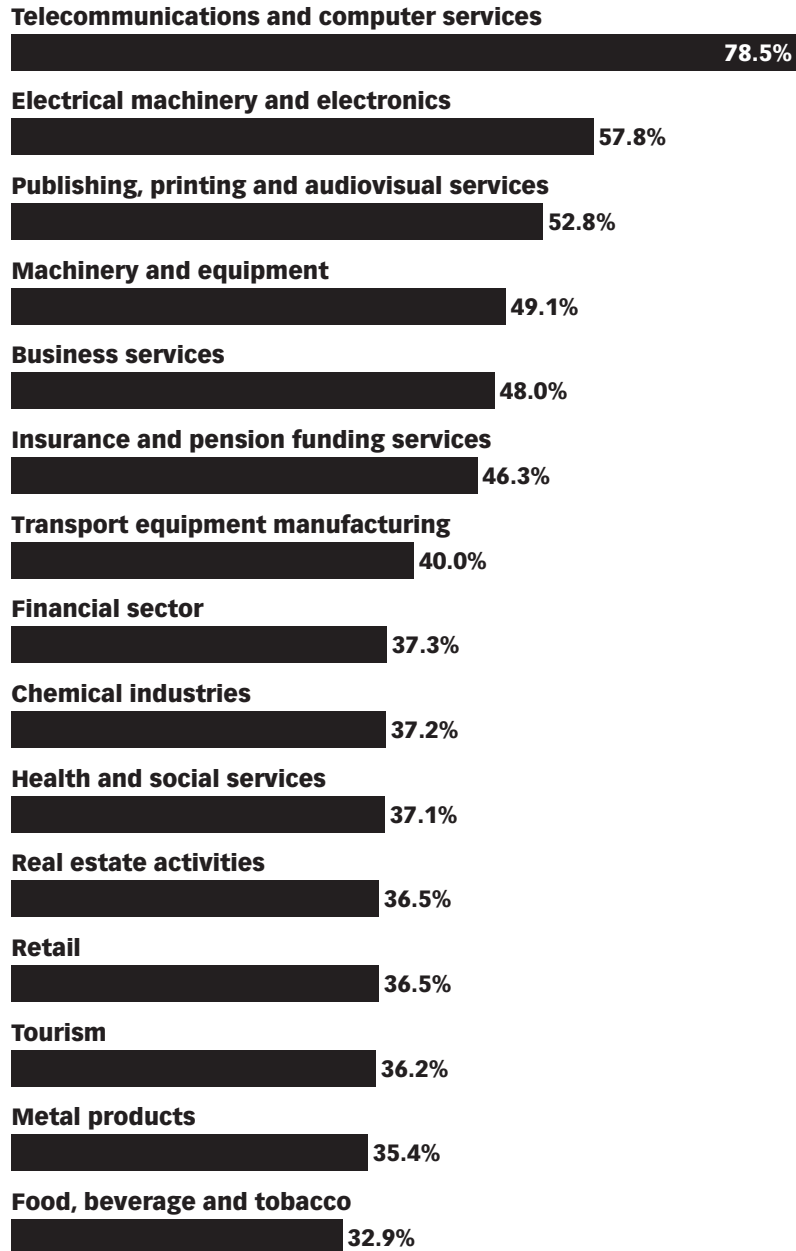
*Source: e-Business W@tch, October 2002*



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Broken down by industry, firms in the telecommunications and computer services vertical were by far the most likely to be purchasing online, followed by businesses in the electrical machinery and electronics sector, and then the publishing, printing and audiovisual services industry.

**European\* Businesses Purchasing Online, by Industry, 2002 (as a % of respondents)**



Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK  
 Source: e-Business W@tch, October 2002

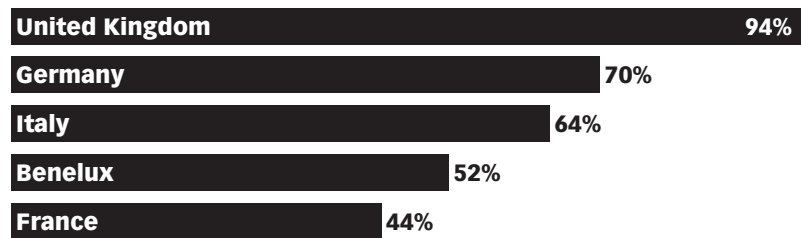
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In a separate study conducted by research firm Vanson Bourne on behalf of Ariba and the London Business School (LBS), businesses in the United Kingdom and Germany were found to be leading other European countries in their efforts to reduce costs by taking advantage of Internet-based technology.

According to the *European Spend Agenda Survey*, procurement professionals in early 2003 are under continued pressure to reduce costs and find ways to become more efficient, as companies search for ways to strengthen their competitive position and improve their bottom line during difficult economic times.

Among those solutions that European procurement professionals are turning to, 42% said they are looking for ways to improve ways of “sourcing suppliers and conducting negotiations,” while 36% are looking for “better access to and analysis of purchasing data.”

**Purchasing Professionals in Europe that Are Using the Internet to Reduce Costs, by Country, November 2002 (as a % of respondents)**



*Note: n=200*  
*Source: Vanson Bourne, Ariba, London Business School, January 2003*

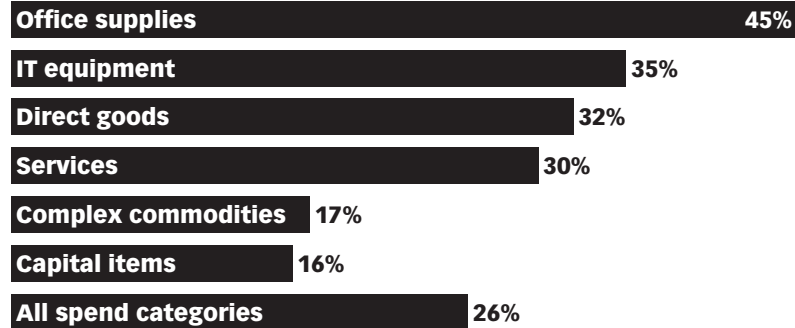
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In total, 39% of the 200 respondents to the Ariba/LBS study said that they already had an e-procurement system in place, with 45% of those companies saying that they used their e-procurement system to purchase office supplies.

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A narrower 32% of those 78 companies that have an e-procurement system said they were using it to purchase direct goods, while 17% said they were using their e-procurement system to purchase complex commodity products.

### Use of E-Procurement Systems by Purchasing Professionals in Europe, by Spend Category, 2003 (as a % of respondents)



Note: n=73

Source: Vanson Bourne, Ariba, London Business School, January 2003

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Among the survey's conclusions, the authors noted that heading into 2003, European purchasing managers were placing a greater emphasis on negotiating price reductions from their suppliers, rather than using technology to pursue productivity gains within their internal spend management processes.

Indeed, as a result of cost-cutting at their companies, purchasing professionals indicated that they were presently having to make do with whatever best of breed e-procurement technology that they had available, while many admitted that they had not yet implemented a "strategic and holistic approach" to automated supply chain management.

In a similar study conducted on behalf of Commerce One, Benchmark Research surveyed 150 purchasing managers from the United States, the United Kingdom and Germany, finding that in general, British companies were not far behind their American counterparts in their use of various e-procurement solutions. On the other hand, businesses in Germany tended to rely more heavily upon traditional offline purchasing procedures.

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For example, 61% of American companies said that they made some purchases from suppliers' online catalogs or shopping carts, while 57% of British companies and 40% of German businesses did so as well. Large German enterprises were also the least likely to be using online auctions, at 9% of respondents, compared with 38% of American firms and 32% of British firms that are using online auctions.

**Use of E-Procurement Solutions among Enterprises in the UK and Germany, 2002 (as a % of respondents)**

	<b>UK</b>	<b>Germany</b>
Purchase via a supplier's online catalogue/shopping cart	57%	40%
Purchase using e-procurement software	41%	30%
Purchase via online auctions	32%	3%
Purchase via a trading exchange	10%	9%

*Note: n=50 enterprises with 5,000+ employees in the UK and 50 enterprises with 5,000+ employees in Germany*  
*Source: Benchmark Research Ltd. for Commerce One, July 2002*

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Not surprisingly, German companies were found to be channeling a relatively small portion of their total purchasing via the Internet – about half that of British firms. Very few employees at German companies had access to online purchasing tools as well, compared with 9% of employees at American enterprises and 11% of employees who work for British firms.

**Extent of the Use of E-Procurement Solutions among Enterprises in the UK and Germany, 2002**

	<b>UK</b>	<b>Germany</b>
Average percent of all purchasing conducted online	13%	7%
Average percent of employees who can request a purchase online	11%	1%

*Note: n=50 enterprises with 5,000+ employees in the UK and 50 enterprises with 5,000+ employees in Germany*  
*Source: Benchmark Research Ltd. for Commerce One, July 2002*

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Despite US- and UK-based enterprises' early lead in their use of various e-procurement solutions, most of these companies have not yet integrated their e-procurement solutions with back end systems. Just 24% of American companies have connected their e-procurement systems with ERP or SCM systems, compared with 20% of British enterprises and 4% of German enterprises.

**Level of E-Procurement Solutions Integration among Enterprises in the UK and Germany, 2002 (as a % of respondents)**

	UK	Germany
E-procurement solution provides an automated format for internal customers to submit requests for purchases	30%	6%
E-procurement solution receives regular price update information from suppliers to update vendor database	18%	26%
E-procurement technology is linked to extensive central database of supplier information	30%	22%
E-procurement solution issues tenders to suppliers electronically and receives bids back in standard format	22%	12%
E-procurement system is integrated with ERP/SCM	20%	4%

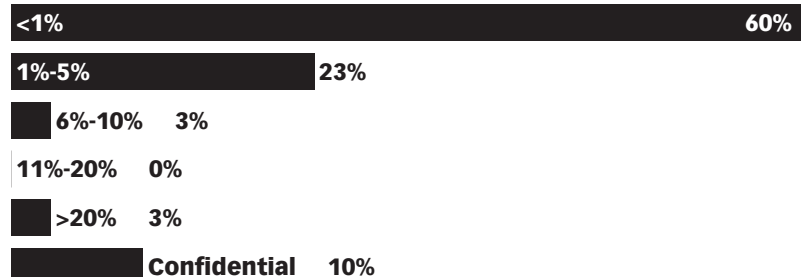
*Note: n=50 enterprises with 5,000+ employees in the UK and 50 enterprises with 5,000+ employees in Germany*  
*Source: Benchmark Research Ltd. for Commerce One, July 2002*

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When it comes to European companies' participation in business-to-business exchanges, Forrester Research found in late 2001 that for 60% of the companies it spoke with, less than 1% of their total direct spending was being channeled through such networks. A further 23% of respondents said that between 1% and 5% of their spending was going through a business-to-business exchange.

**Direct Purchasing Conducted through B2B Exchanges by Companies in Europe, 2001 (as a % of respondents)**



*Note: n=30 exchange users*  
*Source: Forrester Research, March 2002*

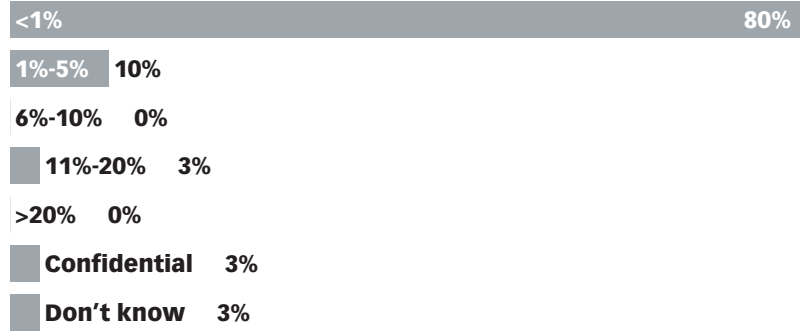
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Exchange-based sales were even lower among the 30 companies surveyed by Forrester Research, with 80% of respondents saying that they directed less than 1% of their companies' sales through a business-to-business exchange.

### Sales Conducted through B2B Exchanges by Companies in Europe, 2001 (as a % of respondents)



Note: n=30 exchange users  
 Source: Forrester Research, March 2002

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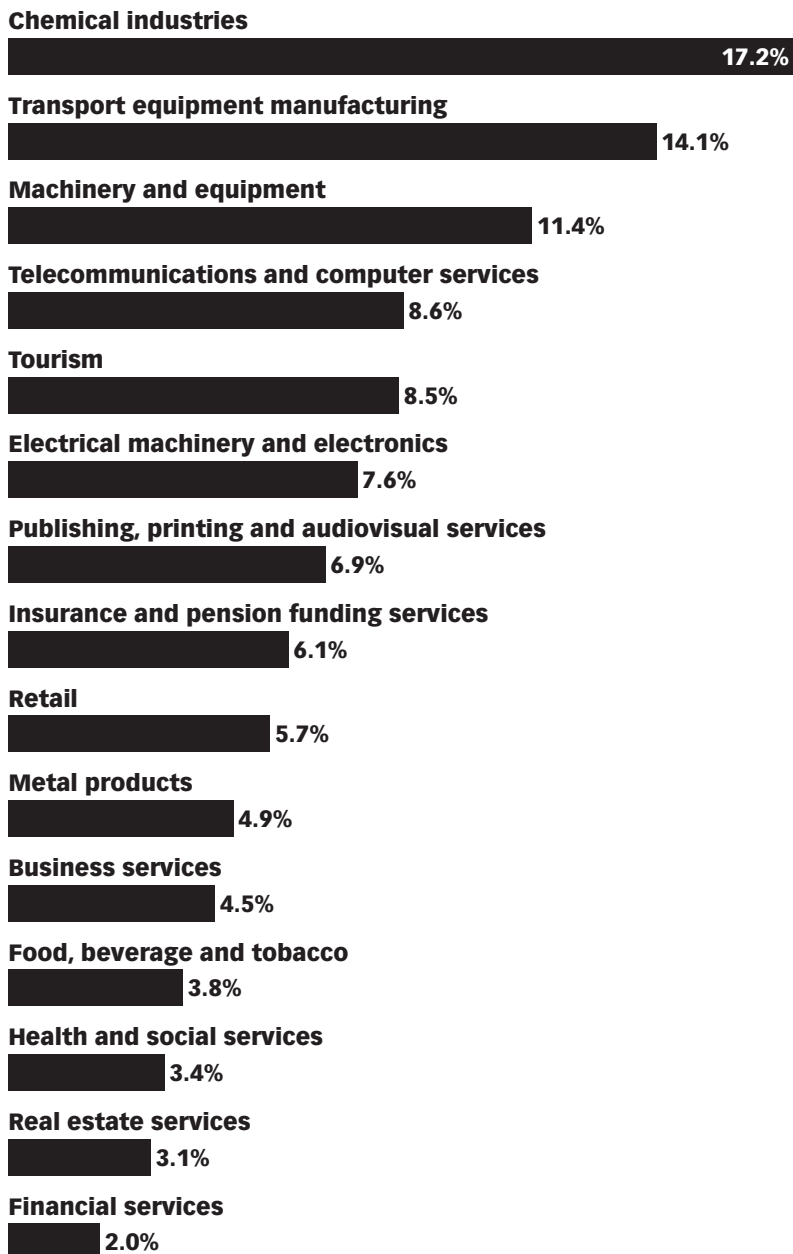
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As a partial explanation for the low sample groups used in Forrester's study, E-Business Watch found that out of the 5,917 European companies that it surveyed, just 6.5% said that they were currently participating in a business-to-business exchange as of mid-2002. A further 4.6% of respondents said that they planned to participate in an exchange within the next year, bringing the total to 656 companies, or 11.1% of those businesses surveyed in the EU-4.

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Among the industry verticals that are seeing the greatest participation in business-to-business exchanges, the chemical and transport equipment industries are ahead of most others. Compared with other manufacturing verticals, the metals and food, beverage and tobacco industries saw the lowest exchange participation rates.

**European\* Businesses' Participation in B2B Exchanges, by Industry, 2002 (as a % of respondents)**



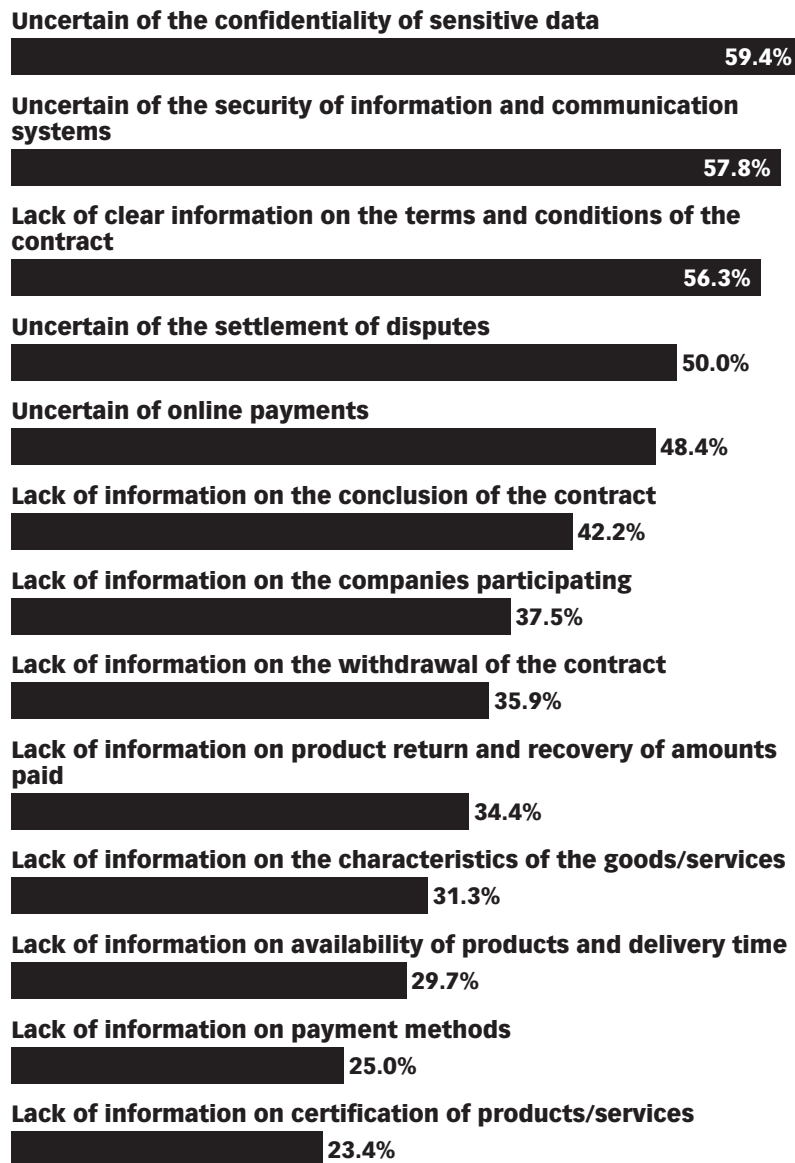
Note: n=5,917; \*respondents are from the EU-4 - France, Germany, Italy and the UK  
 Source: e-Business W@tch, October 2002

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Among the leading reasons cited by European firms for not joining a business-to-business exchange, privacy and security issues were the top two concerns for well over half of respondents in a separate European Commission study.

A significant number of companies also said that they lacked a proper understanding of a variety of issues relating to their potential use of exchanges, from their obligations as exchange members to contract settlement and delivery concerns.

**Important "Trust Barriers for the Use of E-Marketplaces for Online Purchasing" According to Businesses\* in the EU, 2002 (as a % of respondents)**



*continued on page 73*



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## Other

**23.4%**

### Lack of information on the prices of goods/services and additional charges

**20.3%**

### Lack of information on insurance of goods/services

**18.8%**

### Lack of information on the costs of delivery of goods/services

**15.6%**

### Lack of information on the language of the transaction

**14.1%**

*Note: \*companies (48,4%),associations (40,6%) and Chambers of Commerce (10,9%)*

*Source: European Commission, July 2002*

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As Chapter VII confirms, following a year in which exchanges focused on building out their technology offerings and working to expand their early members' use of their networks, many business-to-business exchanges are now in the process of assembling information that provides evidence of tangible benefits and returns that new members may expect to receive.

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## Business-to-Business E-Commerce

According to the World Information Technology and Services Alliance (WITSA), business-to-business e-commerce in Japan totaled \$90.8 billion in 2001, an increase of 31.2% from the \$69 billion that businesses traded online in 2000.

Among the next nine largest Internet economies in the Asia-Pacific region, business-to-business e-commerce totaled \$27.4 billion in 2001 – more than doubling from the \$12.3 billion in online trade that was conducted in 2000.

### B2B E-Commerce in the Asia-Pacific Region, by Country, 1999-2001 (in billions)

	1999	2000	2001
Japan	\$11.65	\$69.00	\$90.87
Australia	\$0.97	\$3.01	\$6.06
South Korea	\$0.18	\$2.59	\$5.70
Tawain	\$0.14	\$2.39	\$5.56
China (PRC)	\$0.07	\$1.69	\$4.33
Singapore	\$0.10	\$0.97	\$1.95
Hong Kong	\$0.16	\$0.60	\$1.23
India	\$0.01	\$0.36	\$1.06
New Zealand	\$0.09	\$0.47	\$0.97
Malaysia	\$0.08	\$0.23	\$0.52

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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By comparison, eMarketer estimates that business-to-business e-commerce in the Asia-Pacific region, including Japan, will increase from \$68.6 billion in 2001 to nearly \$200 billion by the end of 2003.

### B2B E-Commerce Revenues in the Asia-Pacific Region, 2001-2004 (in billions)

2001	\$68.6
2002	\$120.3
2003	\$199.3
2004	\$300.6

Source: eMarketer, 2001

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A third comparative estimate by Computer Economics puts Internet-based trade between businesses in the Asia-Pacific region, including Japan, at \$316.1 billion in 2003. Computer Economics uses a broad definition of e-commerce trade that includes Internet-based trade in business services such as travel and financial services.

**B2B E-Commerce in the Asia-Pacific Region, 2002-2006 (in billions)**

<b>2002</b>	<b>\$187.77</b>
<b>2003</b>	<b>\$316.09</b>
<b>2004</b>	<b>\$540.78</b>
<b>2005</b>	<b>\$812.53</b>
<b>2006</b>	<b>\$1,147.01</b>

Source: Computer Economics, June 2002

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According to mid-2002 estimates released by the Japanese Ministry of Economy, Trade and Industry (METI), business-to-business e-commerce revenues in Japan are forecast to grow from approximately \$514.9 billion in 2003 to more than \$1 trillion by 2006. METI includes internet-EDI as part of its definition of e-commerce, but does not include traditional EDI.

**B2B E-Commerce Revenues in Japan, 2001-2006 (in trillions of ¥ and billions of \$)**

	<b>Trillions ¥</b>	<b>Billions \$</b>
2001	¥34.03	\$285.95
2002	¥43.95	\$369.34
2003	¥61.27	\$514.90
2004	¥78.43	\$659.10
2005	¥98.98	\$831.80
2006	¥125.43	\$1,054.08

Note: converted on 12 August 2002 at a rate of 118.995 yen/USD

Source: Ministry of Economy, Trade and Industry (METI) - Japan, 2002

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The electronics and information products industry, followed by the automotive industry, are by far the biggest users of e-commerce technology in Japan, accounting for a combined 84.1% share of business-to-business e-commerce trade during 2001.

### **B2B E-Commerce Revenues in Japan, by Industry, 2001 (in trillions of ¥ and billions of \$)**

	<b>Trillions ¥</b>	<b>Billions \$</b>
Electronic/information products	¥15.085	\$126.77
Automotive	¥13.520	\$113.62
Industrial/precision machinery	¥0.966	\$8.12
Iron/nonferrous/raw materials	¥0.875	\$7.35
Textile/sundry goods	¥0.827	\$6.95
Food	¥0.817	\$6.87
Transportation/travel services	¥0.551	\$4.63
Chemical products	¥0.456	\$3.83
Information processing/software services	¥0.385	\$3.24
Construction	¥0.378	\$3.18
Paper/office products	¥0.133	\$1.12
Other services	¥0.027	\$0.23
Communications/broadcasting services	¥0.014	\$0.12
Financial/insurance services	¥0.001	\$0.01
<b>Total</b>	<b>¥34.027</b>	<b>\$285.95</b>

*Note: converted on 12 August 2002 at a rate of 118.995 yen/USD; numbers may not equal total due to rounding*

*Source: Ministry of Economy, Trade and Industry (METI) - Japan, 2002*

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Both industries are expected to retain their leadership positions in 2006, while other economic sectors such as the construction and textile industries are expected to see their e-commerce activity increase dramatically over the next three years.

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(in trillions of ¥ and billions of \$)**

	<b>Trillions ¥</b>	<b>Billions \$</b>
Electronic/information products	¥31.006	\$260.57
Automotive	¥23.455	\$197.11
Construction	¥14.475	\$121.64
Textile/sundry goods	¥10.975	\$92.23
Iron/nonferrous/raw materials	¥8.241	\$69.26
Food	¥8.178	\$68.73
Chemical products	¥7.087	\$59.56
Industrial/precision machinery	¥6.986	\$58.71
Transportation/travel services	¥6.447	\$54.18
Paper/office products	¥5.155	\$43.32
Information processing/software services	¥2.295	\$19.29
Utility-related services	¥0.815	\$6.85
Other services	¥0.151	\$1.27
Communications/broadcasting services	¥0.138	\$1.16
Financial/insurance services	¥0.038	\$0.32
<b>Total</b>	<b>¥125.430</b>	<b>\$1054.08</b>

*Note: converted on 12 August 2002 at a rate of 118.995 yen/USD; numbers may not equal total due to rounding*

*Source: Ministry of Economy, Trade and Industry (METI) - Japan, 2002*

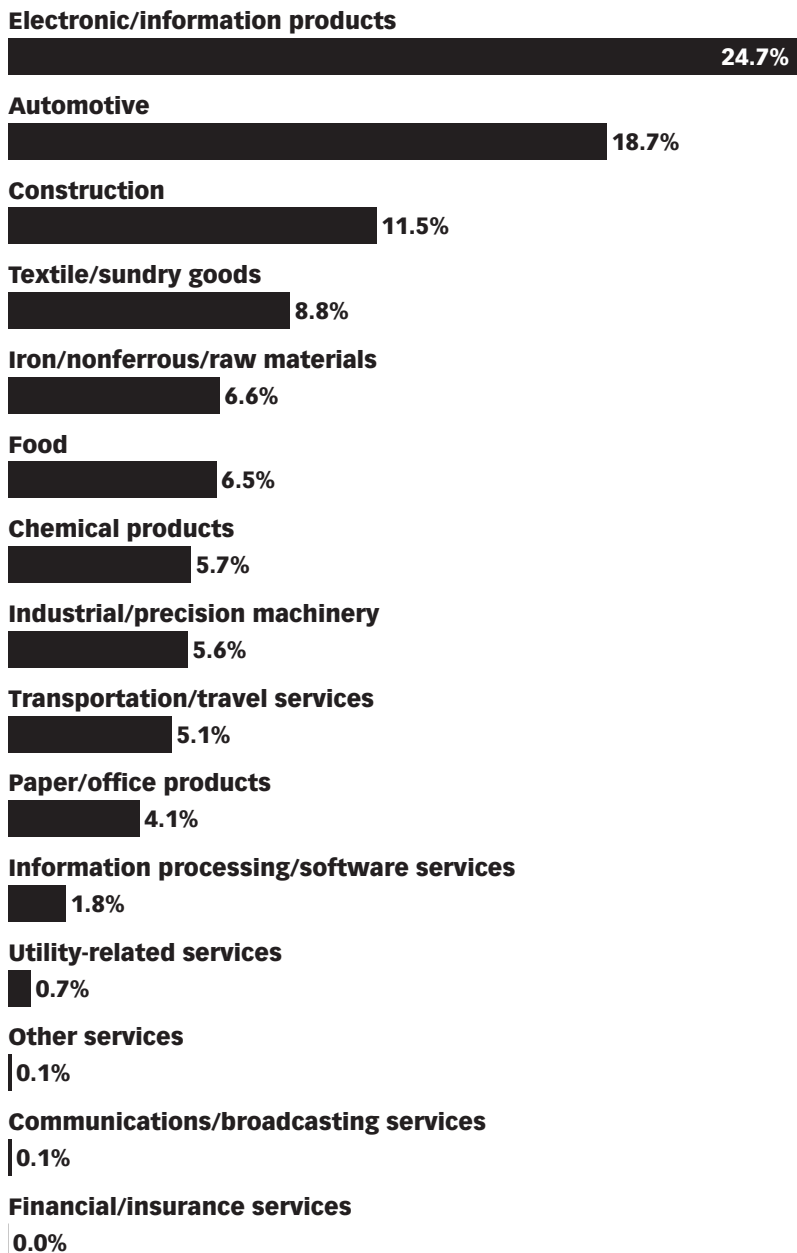
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As a percent of business-to-business e-commerce activity across all industries, the electronics industry is expected to make up 24.7% of all trade, while the automotive industry will make up 18.7% of electronic trade. This is down from these two industries' prior dominance of e-commerce activity, in which they accounted for a combined 84.0% of Japan's e-commerce in 2001.

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**Breakdown of B2B E-Commerce in Japan, by Industry, 2006**



Note: Total market=¥125.43 trillion  
 Source: Ministry of Economy, Trade and Industry (METI) - Japan, 2002

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As the second largest e-commerce economy in the Asia-Pacific region, Australia is forecast to see its online trade grow from \$6.2 billion in 2001 to \$87.1 billion by 2006, according to IDC.



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This fourteen-fold growth will be driven by the leadership of large Australian companies, coupled with strong adoption rates on the part of small and medium sized businesses in Australia.

### **B2B E-Commerce in Australia, 2001 & 2006 (in billions)**

<b>2001</b>	<b>\$6.2</b>
<b>2006</b>	<b>\$87.1</b>

Source: *International Data Corporation (IDC), March 2002*

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According to the Korean National Statistical Office, e-commerce activity in South Korea totaled \$92.5 billion in 2001. Business-to-business e-commerce accounted for \$84.7 billion, or 91.6% of that total.

The Korean government estimates that 8.8% of all economic activity in South Korea was channeled online in 2001, and has set a goal of driving 30% of all national trade online by 2005.

The electronics industry accounted for 32.1% of e-commerce activity in South Korea in 2001, while the retail/wholesale sector comprised 13% of the \$92.5 billion that was traded online in 2001.

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## E-Business Spending

According to WITSA's *Digital Planet 2002* report China leads the world in the percent of total IT dollars that are invested in e-business, or Internet-related initiatives. Already one of the fastest-growing technology markets in the world, China is seeking to modernize its IT infrastructure by investing in the most current technology available.

A similar pattern of e-business investment is common among most other developing countries as well, which are also directing a significantly large portion of their IT spending toward e-business technologies.

### E-Business Technology Spending in the Asia-Pacific Region, by Country, 1999-2001 (as a % of IT spending)

	1999	2000	2001
China (PRC)	19%	27%	32%
Singapore	12%	15%	18%
Malaysia	11%	15%	18%
Philippines	11%	15%	18%
Japan	11%	15%	16%
Australia	10%	13%	16%
South Korea	9%	15%	15%
India	10%	13%	15%
New Zealand	9%	12%	14%
Hong Kong	7%	9%	14%

Source: *World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002*

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Computer Economics estimates that e-business spending in the Asia-Pacific region, including Japan, totaled \$18.2 billion in 2002, with the greatest portion of e-business dollars being spent on hardware and technology staff.

### E-Business Spending in the Asia-Pacific Region, by Category, 2002 (in billions)

Outside services	\$1.27
Technology staff	\$5.00
Software	\$3.17
Hardware	\$8.74
<b>Total</b>	<b>\$18.18</b>

Source: *Computer Economics, May 2002*

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Looking ahead to 2006, IDC predicts that the Asia-Pacific market for e-commerce solutions alone will total \$4.5 billion, up from sales of \$1.5 billion in 2001.

**E-Commerce Solutions Market in the Asia-Pacific\* Region, 2001 & 2006 (in billions)**



*Note: \*excluding Japan*  
*Source: International Data Corporation (IDC), May 2002*

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**Stage of E-Business Development**

In mid-2002, the Economist Intelligence Unit (EIU) ranked 60 countries throughout the world according to their relative scores on its e-business readiness index. The EIU considered 30 variables to arrive at each country's final index score. Such variables include a country's overall business and regulatory environment, the social and cultural infrastructure of each country, as well as consumer and business adoption levels of e-business and information technology.

Surprisingly, Japan came in 25<sup>th</sup> overall, while Australia achieved the highest score in the Asia-Pacific region, ranking 6<sup>th</sup> worldwide. The EIU study singled out both Singapore and Hong Kong as having some of the best technology infrastructure in the world, although the study's authors also noted that neither country's business culture had embraced the Internet to the same extent as businesses had in the United States.

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Among those countries outside of the top ten in Asia, China ranked 51<sup>st</sup> worldwide, followed by Indonesia at 52 and Vietnam at 56.

### Leading E-Business Ready Countries in the Asia-Pacific Region , 2002 (ranked by index\* score)

<b>Australia</b>	<b>8.30</b>
<b>Singapore</b>	<b>8.17</b>
<b>Hong Kong</b>	<b>8.13</b>
<b>New Zealand</b>	<b>7.67</b>
<b>Taiwan</b>	<b>7.26</b>
<b>South Korea</b>	<b>7.11</b>
<b>Japan</b>	<b>6.86</b>
<b>Malaysia</b>	<b>5.50</b>
<b>Sri Lanka</b>	<b>4.05</b>
<b>India</b>	<b>4.02</b>

*Note: \*based upon an index of 1 to 10 where 10=most e-business ready*  
*Source: Economist Intelligence Unit, July 2002*

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By comparison, in an even more comprehensive study, the World Economic Forum's Networked Readiness Index examined 82 countries, using 64 different variables to arrive at an overall index score for each national economy.

Three separate sub-indices examined each country's overall business environment, its readiness to use information technology, and each country's current use of its installed base of IT infrastructure. Within each sub-index, three major domestic constituencies were scored – individuals, businesses, and government.

According to the Business Usage Index, companies in Singapore, South Korea and Hong Kong led all other Asian countries in their use of IT and telecommunications infrastructure. Once again, Japan scored lower than most of its regional counterparts.

Among the factors considered for this ranking include the level of business-to-consumer and business-to-business e-commerce activity, as well as businesses' use of online marketing and other Internet-based communications channels.

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Outside of the top 10 countries, Indonesia ranked 47<sup>th</sup> overall, followed by the Philippines at 48<sup>th</sup> and Bangladesh at 67<sup>th</sup>. China scored the lowest in the region, coming in 72<sup>nd</sup> out of 82 countries worldwide.

### Leading Asia-Pacific Region Economies' Business Usage of ICT, 2002-2003 (ranked by Networked Readiness Index score)

<b>7. Singapore</b>	<b>5.49</b>
<b>12. South Korea</b>	<b>5.20</b>
<b>15. Hong Kong SAR</b>	<b>5.08</b>
<b>16. Australia</b>	<b>5.06</b>
<b>18. Taiwan</b>	<b>5.05</b>
<b>23. Japan</b>	<b>4.90</b>
<b>29. New Zealand</b>	<b>4.54</b>
<b>36. Malaysia</b>	<b>3.95</b>
<b>42. India</b>	<b>3.71</b>
<b>45. Thailand</b>	<b>3.60</b>

*Note: based upon an index of 1 to 7, where 7 equals most networked; ranking based on 82 economies included in study*

*Source: INSEAD, World Economic Forum, February 2003*

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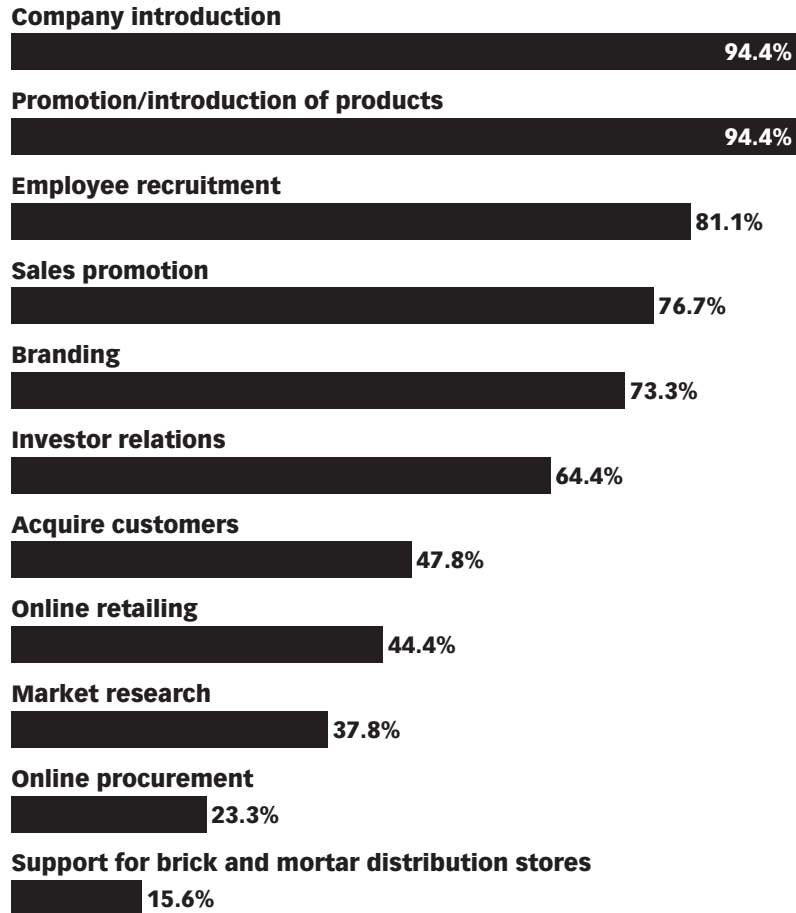
In taking a closer look at Japanese companies' use of the Internet, businesses in Japan are similar to their counterparts in Western Europe and Canada, with many firms operating a company Web site that provides background information about their organization, along with basic product information.

However, few Japanese companies are extensively using the Internet to buy or sell goods online, unlike American businesses, which are ahead of most other regions in the world.

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According to the 90 companies surveyed by the Japan Advertisers Association, just 23.3% were purchasing online, compared with 76.7% of businesses that promote their products or services online.

**Leading Uses of the Internet among Companies in Japan, 2002 (as a % of respondents)**



*Note: n=90 member companies of the Japan Advertisers Association  
Source: Japan Advertisers Association, Asia E-Business Workshop, August 2002*

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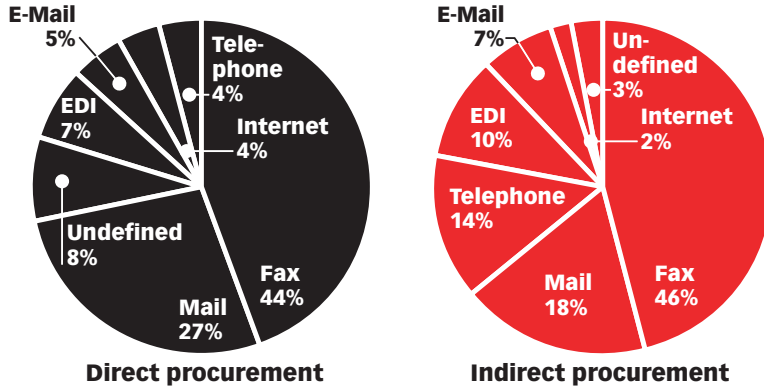
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During the first half of 2002, the SAP Australian Users' Group surveyed 38 medium and large Australian companies to measure their current and planned use of Internet-based procurement solutions.

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The study found that for the most part, Australian businesses were largely relying upon traditional mail and fax-based communications, for both their direct and indirect procurement needs. Just 10% of respondents used EDI for indirect procurement, while no more than 4% of companies used the Internet to purchase direct or indirect goods.

**Direct and Indirect Procurement Activity Conducted by Companies in Australia, by Channel, 2002 (average percent by channel)**



*Note: n=38 companies, members of the SAP Australian Users' Group  
Source: ERP Research Group at the School of Information Systems, Victoria University - Australia/SAP Australian Users' Group (SAUG), May 2002*

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When asked to look ahead to the first half of 2003, 41% of respondents said that they expected to still be using fax-based systems to purchase direct materials, with just 6% anticipating that they would be using the Internet. As for indirect materials, 42% of respondents planned to still be using faxes in early 2003, while 6% said they would be online.

There are exceptions, however. One firm in the health care sector was found to be conducting more than 50% of its total spending online.

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Among the barriers that Australian companies listed as their main reasons for not adopting e-procurement solutions to date, inadequate technology infrastructure and a lack of skilled personnel were rated the highest, along with a lack of preparedness on behalf of their trading partners.

**Leading Barriers to the Adoption of E-Procurement Solutions among Companies in Australia, 2002 (by average ranking\*)**



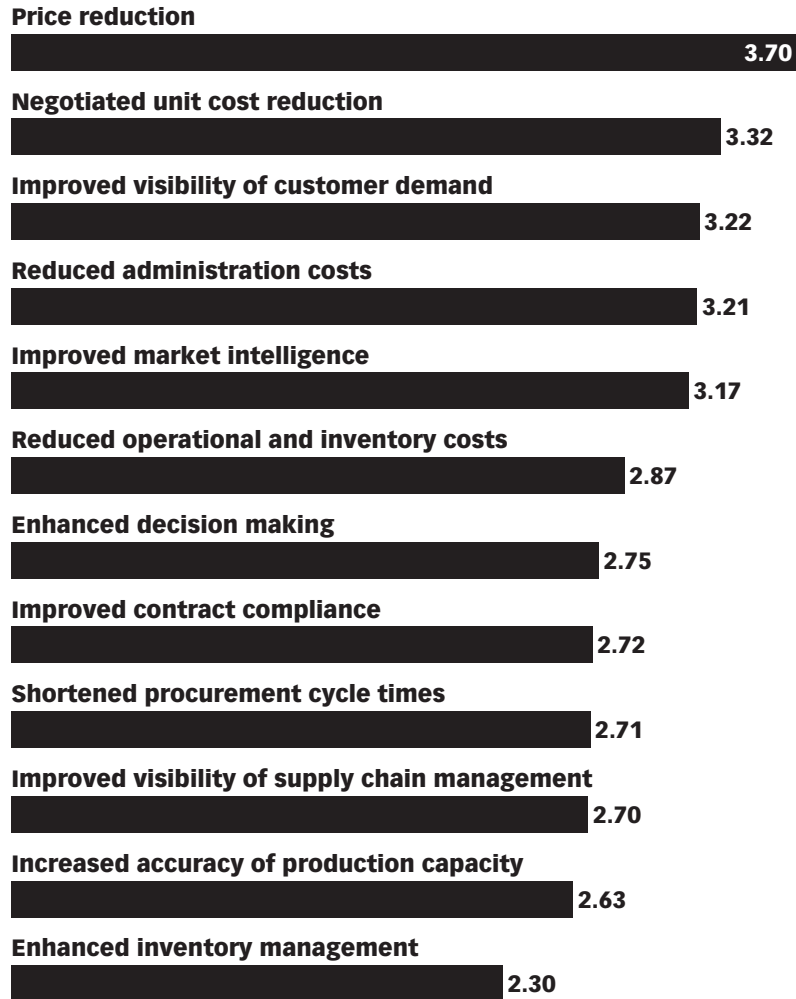
*Note: n=38 companies, members of the SAP Australian Users' Group; \*based on a scale of 1 to 5, where 5 = most important*  
 Source: ERP Research Group at the School of Information Systems, Victoria University - Australia/SAP Australian Users' Group (SAUG), May 2002



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On the positive side, Australian companies listed the goals of price reduction and negotiated cost reductions as the leading drivers that would encourage them to adopt e-procurement solutions. Improved visibility of customer demand and reduced administration costs were rated highly as well.

**Leading Drivers Behind the Adoption of E-Procurement Solutions among Companies in Australia, 2002 (by average ranking\*)**



*Note: n=38 companies, members of the SAP Australian Users' Group;  
 \*based on a scale of 1 to 5, where 5 = most important  
 Source: ERP Research Group at the School of Information Systems, Victoria University - Australia/SAP Australian Users' Group (SAUG), May 2002*

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## Business-to-Business E-Commerce

According to estimates from the World Information Technology and Services Alliance (WITSA), business-to-business e-commerce trade in Latin America totaled \$11.2 billion in 2001, a 130% increase from the \$4.8 billion in goods that were traded online during 2000.

Mexico and Brazil had the two largest online economies, with business-to-business e-commerce revenues of just under \$4 billion apiece.

### B2B E-Commerce in Latin America, by Country, 1999-2001 (in billions)

	1999	2000	2001
Mexico	\$0.17	\$1.74	\$3.99
Brazil	\$0.17	\$1.68	\$3.87
Argentina	\$0.03	\$0.64	\$1.46
Chile	\$0.02	\$0.22	\$0.50
Other Latin American countries	\$0.05	\$0.57	\$1.37

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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By comparison, eMarketer estimates that business-to-business e-commerce in Latin America totaled \$7.8 billion in 2001, and will reach \$33.6 billion by the end of 2003.

### B2B E-Commerce in Latin America by Country, 2000 - 2004 (in billions)

	2000	2001	2002	2003	2004
Argentina	\$0.27	\$0.75	\$1.98	\$3.48	\$5.92
Brazil	\$1.95	\$5.30	\$10.48	\$20.62	\$34.72
Mexico	\$0.44	\$1.26	\$3.52	\$6.47	\$11.84
Rest of Region	\$0.19	\$0.55	\$1.41	\$3.06	\$5.92
<b>Total</b>	<b>\$2.85</b>	<b>\$7.87</b>	<b>\$17.39</b>	<b>\$33.63</b>	<b>\$58.39</b>

Note: Figures may not add up precisely due to rounding.

Source: eMarketer, 2001

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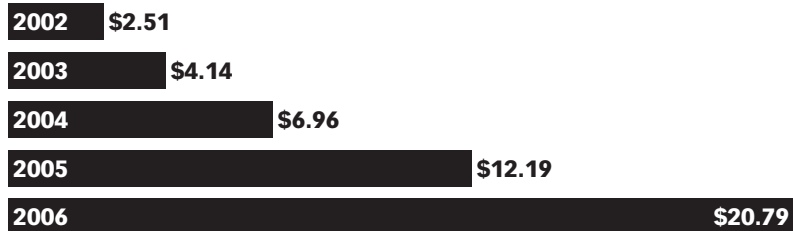
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In a second comparative estimate from Computer Economics, Latin American business-to-business e-commerce is forecast to reach \$4.14 billion by the end of 2003, and then increase nearly five-fold to almost \$20.8 billion in 2006. It is worthwhile to note that Computer Economics' definition of e-commerce revenues includes the online sale of business services, such as travel and financial services.

**B2B E-Commerce in Latin America, 2002-2006 (in billions)**



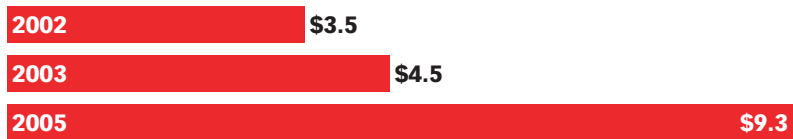
Source: Computer Economics, June 2002

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A much more conservative forecast by E-consulting estimates that business-to-business e-commerce in Latin America will grow to just \$4.5 billion in 2003. By 2006, online trade between businesses in the region is expected to more than double, reaching \$9.3 billion in three years' time.

**B2B E-Commerce in Latin America, 2002, 2003 & 2005 (in billions)**



Source: E-consulting, 2002; Business News Americas, July 2002

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## E-Business Spending

According to WITSA, Mexico directed a substantial 27% of all IT spending toward e-business initiatives in 2001, ranking third in the world behind China and Israel.

Indeed, most Latin American countries are spending a considerable portion of their technology dollars on the latest Internet-based technology, as they modernize their economies and play catch up with their counterparts in the United States and Europe.

### E-Business Technology Spending in Latin America, by Country, 1999-2001 (as a % of IT spending)

	1999	2000	2001
Mexico	11%	19%	27%
Colombia	9%	14%	21%
Argentina	12%	19%	21%
Brazil	11%	15%	18%
Chile	11%	15%	18%
Venezuela	11%	15%	18%
Other Latin American countries	7%	8%	10%

Source: World Information Technology and Services Alliance (WITSA), International Data Corporation, February 2002

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According to Computer Economics, e-business spending in Latin America totaled \$2.21 billion in 2002, with \$1.2 billion going to hardware. Another \$550 million was directed toward e-business software purchases.

### E-Business Spending in Latin America, by Category, 2002 (in billions)

Hardware	\$1.19
Software	\$0.55
Technology staff	\$0.30
Outside services	\$0.17
<b>Total</b>	<b>\$2.21</b>

Source: Computer Economics, May 2002

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## Stage of E-Business Development

In mid-2002, the Economist Intelligence Unit (EIU) ranked 60 countries from around the world based upon their relative e-business readiness. Each country was scored according to 30 variables that considered such factors as a country's regulatory environment, installed base of technology, and current use of technology by business and government.

Chile received the highest score among its peers in Latin America, ranking 28<sup>th</sup> worldwide. Mexico, Brazil and Argentina placed 30<sup>th</sup>, 34<sup>th</sup> and 35<sup>th</sup>, respectively.

### Leading E-Business Ready Countries in Latin America, 2002 (ranked by index\* score)

<b>Chile</b>	<b>6.36</b>
<b>Mexico</b>	<b>5.67</b>
<b>Brazil</b>	<b>5.31</b>
<b>Argentina</b>	<b>5.14</b>
<b>Venezuela</b>	<b>5.14</b>
<b>Colombia</b>	<b>4.77</b>
<b>Peru</b>	<b>4.43</b>
<b>Ecuador</b>	<b>3.68</b>

*Note: \*based upon an index of 1 to 10 where 10=most e-business ready*  
*Source: Economist Intelligence Unit, July 2002*

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In a separate study conducted by the World Economic Forum, 82 countries were rated according to 64 separate variables. Each country's Network Readiness Index score was calculated using three sub-indices, which in turn surveyed the readiness and usage of a country's IT infrastructure among three main constituents – government, business and individuals.

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According to the Business Usage sub-index, Argentina scored the highest in Latin America and placed 17<sup>th</sup> among all countries that were included in the survey. Brazil was not far behind Argentina, coming in 19<sup>th</sup> overall, while in contrast to the EIU's findings, Chile ranked relatively lower, in 35<sup>th</sup> place worldwide.

**Leading Latin American Economies' Business Usage of ICT, 2002-2003 (ranked by Networked Readiness Index score)**

<b>17. Argentina</b>	<b>5.05</b>
<b>19. Brazil</b>	<b>5.03</b>
<b>32. Mexico</b>	<b>4.31</b>
<b>32. Venezuela</b>	<b>4.01</b>
<b>35. Chile</b>	<b>3.98</b>
<b>40. Costa Rica</b>	<b>3.76</b>
<b>46. El Salvador</b>	<b>3.60</b>
<b>53. Panama</b>	<b>3.43</b>
<b>55. Ecuador</b>	<b>3.40</b>
<b>56. Uruguay</b>	<b>3.36</b>

*Note: based upon an index of 1 to 7, where 7 equals most networked; ranking based on 82 economies included in study*  
 Source: INSEAD, World Economic Forum, February 2003

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## Internet EDI

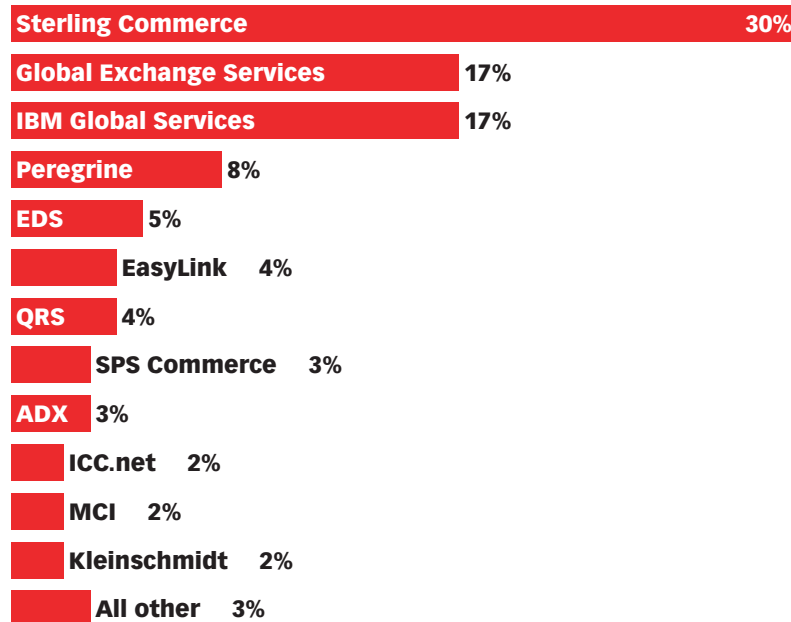
With electronic data interchange (EDI) networks still carrying the majority of automated transactions between businesses, it is worthwhile to consider the role of these legacy systems, which will continue to serve large enterprises and their key trading partners for the short to mid-term.

**“In day-to-day operational settings, integration starts with the transaction....It follows that automating the transaction is the first step toward supply chain collaboration.”**

– Jim Ericson, *Line56 Magazine*

According to the Giga Information Group, Sterling Commerce currently has the largest number of customers using its value added networks (VANs) in North America, with a 30% market share in the United States and Canada. Global Exchange Services, which was sold by GE to Francisco Partners in June of 2002, has a 17% share of North American VAN customers, as does IBM Global Services.

### Market Share of General-Purpose EDI Vendors in North America, 2002



Source: Giga Information Group, March 2002

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Several smaller Internet-EDI enablers have sprouted up over the past few years as well. Included among these companies are ADX and ICC.net, which have successfully developed niche implementation and data translation services that help large companies expand their EDI networks by handling the sign up, training and data translation needs of small and mid-sized trading partners.

**“Although Internet EDI has been available since 1996-97, the push by Global 2000 companies to deploy it is just beginning.”**

– Carl Lehmann, Meta Group

Indeed, the Meta Group has found that on average, Global 2000 companies are now targeting between 300 and 3,000 small and medium-sized trading partners when they choose to pursue Internet EDI initiatives. Enablement programs typically manage to sign up 70% of these targeted suppliers, although some enterprises that occupy a strong position within their value chain have achieved higher sign up rates that exceed 90% of suppliers.

With Internet EDI, the Meta Group has found that transaction costs for some paper-based transmissions are reduced to as little as \$1 to \$0.10 per transaction, down from \$8 to \$150 per transaction, depending on the offline or EDI-based processing method that large enterprises have previously used.

Readers should note that eMarketer's March 2002 *E-Commerce Trade & B2B Exchanges* report includes an extensive discussion of Internet-based EDI. Please refer to chapter III of this report for background on how companies such as Global Exchange Services and ADX are helping large enterprises expand their use of Internet EDI.

### Private Exchanges and Independent E-Business Initiatives

As part of its coverage of the business-to-business advertising industry, *BtoB Magazine* conducts an annual study of more than 800 business Web sites, 100 of which are ranked according to their effectiveness as a sales and customer service channel.

In rating each Web site, the study's authors consider the quality and organization of a Web site's information, as well as those customer service resources that encourage visitors to return in the future. Each Web site's aesthetic quality and navigability are considered as well.

In general, BtoB Magazine found that as of mid-2002, businesses are continuing to make strides in improving their overall Web presence, although many Web sites remain excessively cluttered, or continue to have navigational problems. For example, the study found that several Web sites require visitors to return to the home page, in order to go to another part of the Web site.

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On the positive side, 3Com's Web site received the highest index score, thanks to its ease of navigation and the thoroughness of available information. BtoB Magazine noted that 3Com's Web site includes extensive product information, in addition to a product selection wizard and online training capabilities.

ArvinMeritor, American Express, Microsoft and CDW Computer Centers tied for second place, while other companies that scored well but wound up just outside of the top 15 include Pitney Bowes, Wells Fargo and Dell Computer.

American Express was selected as a leader because of features on its home page that encourage visitors to apply for a credit card online, or take a tour of additional services offered by the company. Microsoft scored well because of the extensive product information and support options available on its Web site, including an innovative click-to-talk button for real-time customer service.

### Leading B2B Web Sites, 2002 (ranked by index\* score)

	Industry	Index score
3Com Corporation	Manufacturing: high tech	98
ArvinMeritor Inc.	Automotive	97
American Express Company	Financial services and insurance	97
Microsoft Corporation	Software	97
CDW Computer Centers Inc.	Wholesale/retail/distribution	97
General Motors	Automotive	96
Merrill Lynch & Company	Financial services and insurance	96
Apple Computer Inc.	Manufacturing: high tech	96
APL Ltd.	Transportation and shipping	96
Armstrong Holdings	Construction, construction equipment	95
Comerica	Financial services and insurance	95
National City Corporation	Financial services and insurance	95
IBM Corporation	Manufacturing: high tech	95
Sprint	Telecom services	95
ABF Freight Systems	Transportation and shipping	95

Note: \*index from 1 to 100 where 100 is the highest score

Source: BtoB Magazine, August 2002

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Apple's Web site was singled out for its simplicity and elegance, while Sprint's Web site was complimented for its clear display of customer service numbers. Burlington Northern Santa Fe was noted for its online shipping and tracking data, in addition to its useful display of industry news and resources.

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Please see eMarketer's "Online Selling and eCRM" report for further information about how businesses are using their Web sites to sell online: [http://www.emarketer.com/products/report.php?crm\\_online](http://www.emarketer.com/products/report.php?crm_online)

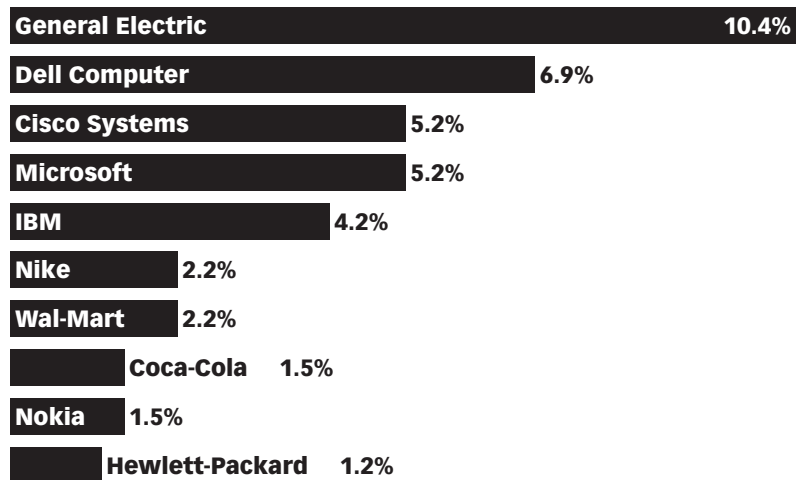
Turning to the buy-side of e-business operations, several companies have invested in various purchasing solutions, ranging from e-procurement portals for the purchase of indirect goods, to full-fledged private exchanges that integrate with key trading partners using supply chain management and other collaborative solutions.

Not surprisingly, detailed information about most enterprises' private e-business initiatives is difficult to come by, as the majority of companies see their technology deployments as a strategic advantage over competitors, and they are therefore reluctant to speak openly about it.

According to a late-2002 survey conducted by the Economist Intelligence Unit (EIU), international executives listed GE, Dell Computer and Cisco Systems as examples of industry leaders that they believe to be operating successful extended enterprises.

Other companies listed outside of the top ten include Procter & Gamble, BP, Pfizer and Toyota.

**Top Ten Companies Reputed to be Operating Successful Extended Enterprises, 2002 (as a % of respondents)**



Note: n=403; respondents were asked to name the most successful example of an extended enterprise operating today  
 Source: Economist Intelligence Unit, December 2002

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In one of the few studies to take a look at some of the early experiences of private exchange owners, the Aberdeen Group interviewed five European enterprises, finding that on average, each company had 62% of its suppliers up and running on its private network and was transacting Euro 660 million (698.9 million USD) in annualized purchasing volume as of mid-2002.

The five profiled companies reported average process cost savings of 22.9%, with average purchased material cost savings of 13.2%. One company reported process cost savings of 80%.

### Reported Benefits of Private Exchange Users in Europe, 2002

	Reported benefits
ALSTOM	50% process time savings, 5% to 30% purchasing savings
Capital One Bank (Europe)	1% to 20% purchasing savings, 20% to 25% supplier consolidation
H.J. Heinz Europe	1% to 2% process cost savings, 10% purchasing savings
Scania	Annual staff productivity savings of €106,000, annual publishing cost savings of €160,000
Siemens	40% process cost savings, 20% purchasing savings

Source: Aberdeen Group, August 2002

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According to the Aberdeen Group, nearly one quarter of all Fortune 100 companies have already built, or are in the process of building a private exchange.

In a separate study of 61 US-based manufacturers, 40% of which are from the chemical industry, AMR Research found that survey respondents had spent an average \$6.57 million to develop their buy- or sell-side e-commerce systems, with each firm expecting an average 7% return on investment.

As of mid-2002, these manufacturers said that 10% of their customers were using Internet-based transactions to purchase products, accounting for 6% of total sales. A further 13% of each firm's sales, on average, were being transacted via EDI.

### Percent of US Manufacturers' Customers Transacting Business via the Internet, 2002

Average % of customers



Average % of total sales conducted online



Note: n=61

Source: AMR Research, June 2002

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On the buy side, survey respondents were connected with an average 15% of their suppliers via the Internet, conducting 9% of their purchasing online. The same respondents said that another 10% of their purchasing was done via EDI, on average.

### Percent of US Manufacturers' Suppliers Transacting Business via the Internet, 2002

**Average % of suppliers**



**Average % of total purchasing conducted online**



Note: n=61

Source: AMR Research, June 2002

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AMR Research noted that many of the companies that it has spoken with had deployed e-commerce capabilities of varying complexity, from basic Web portals and Web sites to more sophisticated private trading exchanges.

Although the economic downturn has slowed many businesses' development of further e-commerce capabilities, AMR Research expects such initiatives to be of considerable benefit to companies as the economy recovers.

As for those companies that are willing to discuss the success of their various e-business initiatives, eMarketer has assembled the following case studies, which confirm that large enterprises are indeed seeing substantial gains thanks to their successful adoption of e-business technology.

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## Eastman Chemical

As one of the leading e-business pioneers in the chemical industry, Eastman Chemical has not only invested in public B2B exchanges such as ChemConnect and Elemica, it has also developed its own private e-commerce platform that it has used to integrate its supply chain systems with key trading partners.

As of mid-2002, Eastman Chemical's private e-commerce platform had 800 registered customers, 17 of which were able to conduct fully integrated e-commerce transactions with Eastman's back end systems.

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### E-Business Profile: Eastman Chemical's Global E-Commerce Platform Use, 2002

Number of registered customers	800
Number of registered users	20,000
Number of user sessions per month	100,000
Number of digitized connections with trading partners	17
Annual revenues generated via e-commerce platform	\$400 million+

*Source: Eastman Chemical, June 2002*

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As early as 2001, it had become apparent to Eastman Chemical that the simple automation of order to cash transactions with its trading partners would not deliver satisfactory returns on its technology investments. Instead, the company realized that it could generate greater value by using collaborative solutions such as CPFR and VMI to make efficiency improvements that would mutually benefit itself and its trading partners.

Prior to embarking upon such ambitious initiatives, Eastman Chemical found that it was crucial to develop a clearly defined e-business strategy, especially since the greatest costs and difficulties would occur in making changes to its own back-end systems, in preparation for external integration. As a side benefit of preparing for e-business integration, these new initiatives provided Eastman Chemical with the opportunity to review and improve many of its internal processes.

Other key lessons learned from the roll-out of Eastman's e-commerce platform include the need to work with those trading partners that are most ready to engage in external integration – both strategically and technically. Eastman Chemical has also found that after the first external integration, the process becomes easier as one expands with other trading partners.

## Wal-Mart

As of October 2002 Wal-Mart has decided to migrate all of its suppliers from its EDI-based value added networks (VANs) to the Internet, as part of an effort to reduce costs by eliminating VAN-based transaction fees.

According to the Giga Information Group, for a company of Wal-Mart's size these savings could add up into the millions. Giga has also noted,



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however, that the cost of maintaining its own Internet-based network could consume a significant portion of those savings.

Wal-Mart is estimated to have 14,000 suppliers who sell more than \$217 billion to the retail giant every year. By October 2003, Wal-Mart expects each of them to be exchanging documents with it via EDI-INT (EDI Internet integration) or AS2 (applicability statement 2) protocols. This affects all purchase orders, billings, invoices and pricing correspondence.

In order to help its suppliers with the transition, Wal-Mart has negotiated a discounted price with iSoft Corp. to provide trading community software to those suppliers that need it. Companies will be able to connect with Wal-Mart via iSoft's system for an annual support fee of \$300.

IBM and Sterling Commerce have also been recommended as integration service providers to Wal-Mart's suppliers.

**Staples**

As of late 2002, Staples' Contract Division had managed to Internet-enable 80% of Staples' largest customers via the company's private customer extranet, StaplesLink. Dedicated to companies with 100 or more employees, StaplesLink was said to have more than 14,000 organizations using its network in November 2002, with as many as 3.3 million individual users logging on to its Web site.

**E-Business Profile: User Metrics for StaplesLink.com, 2002**

Number of organizations buying online	14,000
Number of online users	3.3 million
Percent of enterprise customer base doing some buying online	80%
Reduction in product returns due to online orders	35%

Source: *BtoB Magazine*, November 2002

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Staples has benefited from a 35% reduction in order returns thanks to its online system, while its customers are able to conveniently log on to Staples' extranet to place online orders based upon their organization's independently negotiated prices. Staples does not charge its customers an access fee in order to use its extranet.

Approximately \$700 million of Staples' \$11 billion in annual sales were directed through StaplesLink during 2002, and in early 2003, Staples re-launched its Web site with the goal of increasing online sales by 80% over the next 18 months. According to *BtoB Magazine*, Staples hopes to eventually get rid of paper catalogs entirely, and move to a single online catalog supported by special e-commerce Web sites that are tailored to contract agreements with individual customers.

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### 3Com

For proof that the Internet does not mean disintermediation for distributors and resellers, one need look no further than the example of 3Com.

In 1999, electronics manufacturer 3Com began to sell its own products directly from its Web site, successfully channeling as much as 5% of its total sales through the Internet. However, by June of 2002 3Com had shut down its online store, and was instead using its Web site to redirect sales leads to local resellers.

In short, 3Com found that the headaches of order processing, fulfillment and customer support were best handled by local resellers, while 3Com had also found a way to retain those potential customers that originally come to its Web site, looking to purchase its products.

This was accomplished by using the technology and services of a company called Channel Intelligence, which links visitors to 3Com's Web site directly to product pages on resellers' Web sites. According to *BtoB Magazine*, manufacturers like 3Com pay a monthly fee, while Channel Intelligence handles the maintenance of these reseller links, as well as any necessary site-scraping used to update resellers' Web sites.

#### **E-Business Profile: Sales Generated via 3Com's Online Reseller Network, Q2 2002**

Value of incremental leads re-directed to channel partners	\$135 million
Number of buyers re-directed to channel partners	15,000
Sales conversion rate for re-directed leads	8% to 11%
Sales conversion rate for other marketing programs	1% to 2%

Source: *BtoB Magazine*, 3Com, July 2002

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The new Web site reportedly costs 3Com one-tenth of what it had previously cost the company to run its online storefront. As for early results, the electronics manufacturer has seen an improved conversion rate for re-directed sales leads, while its resellers have seen their sales volumes double.

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## Microsoft

Microsoft operates a proprietary e-procurement system called MS Market, which is accessible by 42,000 employees worldwide and installed at 55 Microsoft locations throughout the world. According to a January 2003 article in *Purchasing* magazine, MS Market processes 440,000 transactions annually.

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### E-Business Profile: Transaction Activity and Usage of Microsoft's MS Market E-Procurement System, 2002

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Number of transactions processed each year	440,000
Number of employees with access to MS Market	42,000
Number of Microsoft sites where MS Market is installed	55 locations
Average cost to process a purchase transaction	Approximately \$5

Source: *Purchasing Magazine, January 2003*

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As of early 2003, Microsoft estimates that it had saved approximately \$700 million in purchasing costs during the previous 18 months, thanks to its ability to consolidate and streamline its procurement practices. It appears that much of Microsoft's savings have come through its ability to achieve cost reductions, although it has reduced transaction processing costs to about \$5 per transaction, which translates to savings of \$7.3 million per year.

Citing Microsoft's procurement of PCs as an example, *Purchasing* noted that Microsoft had reduced its PC costs by 6.5%, in part through its encouragement of suppliers to compete on price. Microsoft accomplishes this by letting its three PC suppliers see each other's prices and product specifications as posted on the MS Market. Each supplier is reviewed quarterly, based on a variety of criteria including price, product quality and delivery execution, while their success is also measured in part by their relative market share of purchases made by MS Market users.

Interestingly, the MS Market system allows internal users to punch out and buy directly from each computer manufacturer's e-commerce portal. Microsoft has found it better to rely upon computer manufacturers' e-commerce systems, since they have already invested in such capabilities as product configuration and order tracking tools. Out of an entire fleet of approximately 120,000 PCs, Microsoft purchases about 40,000 new computers each year.

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## A. Introduction

In December 2002, Booz Allen Hamilton updated a study of B2B exchanges that it had conducted in 2001, finding that out of 1,100 exchanges it had initially reviewed, 45% had gone out of business.

Consortia-backed exchanges, which benefited from deeper pockets and the support of large brick-and-mortar members, had a much better survival rate than other exchanges, with only 21% of consortia-backed exchanges having failed by the end of 2002.

### B2B Exchange Failures, 2001-2002

% of total exchanges that failed	45%
% of consortia-backed exchanges that failed	21%

*Note: n=1,100 exchanges*  
*Source: Booz Allen Hamilton, 2002*

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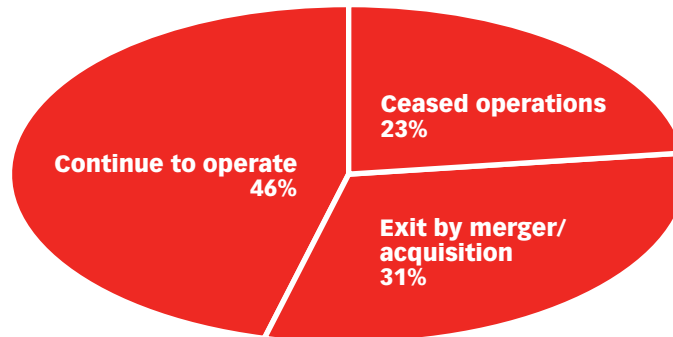
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Among the most successful exchanges were those that had adapted a former offline business model to the Web. Other exchanges survived by shifting to an application service provider (ASP) business model, while a handful of online marketplaces had managed to succeed as intermediaries facilitating Internet-based transactions.

In a narrower study of US-based B2B exchanges, George S. Day and Adam J. Fein examined the survival rate among 124 exchanges that had received at least one round of venture capital funding by the spring of 2000. The study included 77 independent exchanges and 47 non-private exchanges that were linked to an incumbent (brick and mortar) firm.

Of these 124 exchanges, Day and Fein's "Shakeouts in Digital Markets" found that 57 were still operating as of July 2002, while 28 had ceased operations. The remaining 39 exchanges had exited either by merger or acquisition.

### Survival Rates among B2B Exchanges in the US, July 2002 (as a % of exchanges surveyed)



*Note: n=124*  
*Source: George S. Day et al., "Shakeouts in Digital Markets: Lessons From B2B Exchanges", November 2002*

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Just over half of all incumbent-backed exchanges, at 51% of those studied, survived. Independent exchanges did not fare quite as well, although a significant 43% of these exchanges continued to operate.

Broken down by industry, the study found that B2B exchanges in the electronic components industry had the highest survival rate, followed by the food service & beverage industry and the health care sector.

The grocery industry had the lowest survival rate, with just 4 of the 17 initial exchanges continuing operations as of late 2002, while the industrial MRO space saw more than 60% of its exchanges shut down since their initial opening.

### Status of Select US B2B Exchanges, by Industry, July 2002

	# of ex- changes (August 2001)	Continue to operate	Ceased opera- tions	Exit by merger/ acquisition
Electronic components	12	67%	8%	25%
Food service and beverage	17	59%	12%	29%
Health care	13	54%	15%	31%
Paper	10	50%	10%	40%
Construction	23	52%	30%	17%
Automotive aftermarket	14	29%	29%	43%
Industrial MRO	18	39%	22%	39%
Grocery	17	24%	41%	35%

Source: George S. Day et al., "Shakeouts in Digital Markets: Lessons From B2B Exchanges", November 2002

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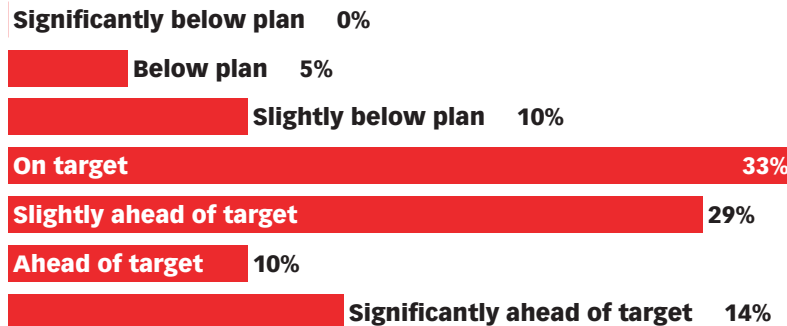
As for those B2B exchanges that have managed to survive, eMarketelect in partnership with the Open Network for Commerce Exchange (ONCE) surveyed 21 active exchanges in January of 2003, as part of an effort to gain insight into the key issues facing such organizations at the beginning of 2003.

In general, the study found that B2B exchanges had a difficult time signing up new members during 2002, although many exchanges succeeded in strengthening and expanding their relationships with current members.

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These results are confirmed by the differences between B2B exchanges' customer acquisition and customer retention numbers – although 86% of respondents said that they either met or exceeded their customer retention goals for 2002, just 43% of respondents could make the same claim for their customer acquisition goals.

### B2B Exchanges' Achievement of Customer Retention Goals, 2002 (as a % of respondents)



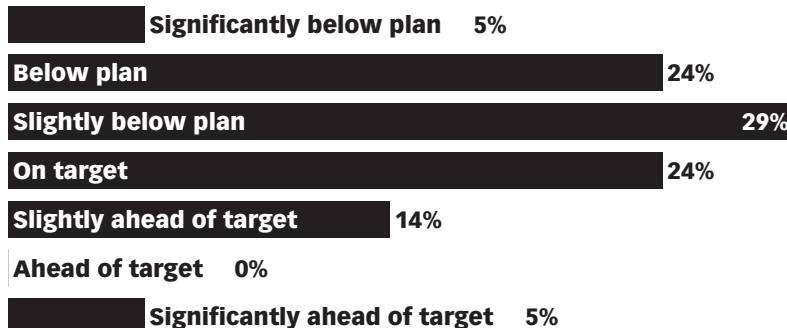
Note: n=21 exchanges  
 Source: eMarketect, Open Network for Commerce Exchange (ONCE), February 2003

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Respondents attributed their difficulties in signing up new customers to the tough economic environment, which led many prospective members to either delay or cancel any ambitious technology initiatives.

Several exchanges have also complained that the negative stigma associated with the dot-com bubble continues to affect non-members' perception of their business models, which in turn leads to prospective customers raising concerns about the long-term viability of their businesses.

### B2B Exchanges' Achievement of Customer Acquisition Goals, 2002 (as a % of respondents)



Note: n=21 exchanges  
 Source: eMarketect, Open Network for Commerce Exchange (ONCE), February 2003

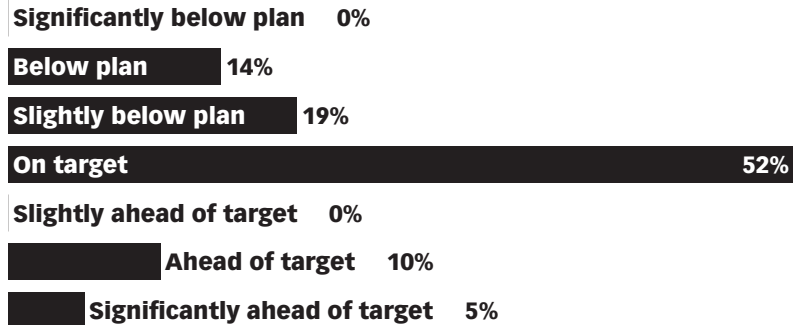
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It may be time for these perceptions to change, however, as 67% of survey respondents said that they had either met or exceeded their recurring revenue goals for 2002. Assuming that most exchanges expected to see some revenue growth last year, these results indicate that by increasing their recurring revenues, more than two-thirds of exchanges managed to strengthen their financial positions during 2002.

**B2B Exchanges' Achievement of Recurring Revenue Goals, 2002 (as a % of respondents)**

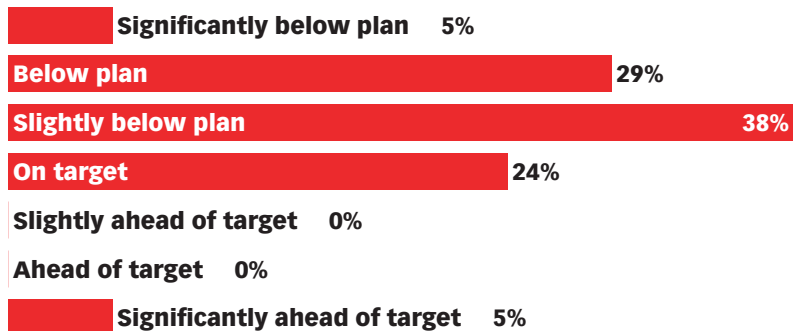


Note: n=21 exchanges  
 Source: eMarketect, Open Network for Commerce Exchange (ONCE), February 2003

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On the downside, just 29% of survey respondents said that they had succeeded in meeting their new revenue targets last year. As mentioned above, this has largely been a result of the difficult economic environment, which has led prospective members to be more cautious about initiating new e-business relationships.

**B2B Exchanges' Achievement of New Revenue Goals, 2002 (as a % of respondents)**



Note: n=21 exchanges  
 Source: eMarketect, Open Network for Commerce Exchange (ONCE), February 2003

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Looking ahead to 2003, respondents to the eMarketer/ONCE survey understand that they need to do a better job of communicating the benefits that their current members are presently enjoying through their use of these exchanges. They are, however, confident that as these success stories come to be better known, there is considerable upside to the future growth of their exchange networks.

**“It’s clear that customers are achieving ROI and other key benefits from participation in these networks. The challenge facing trading network executives is convincing prospects of these benefits.”**

– Casey Freymuth, publisher eMarketer

Few B2B exchanges have yet had the opportunity to produce case studies that clearly demonstrate these gains, due in part to their short histories – most exchanges have only completed one or two full years of active operation. One group that has begun to address this need to better communicate the benefits of exchange membership is ONCE, which in its role as a B2B exchange advocacy group is in the process of developing case studies on behalf of its members.

Among the 10 B2B exchanges that eMarketer interviewed for this report, the general outlook can be considered confidently optimistic. Although some exchanges have hinted that they expect further closures or consolidation among exchanges in non-competing industries, all are certain about the stability of their own businesses, and in most cases are predicting steady growth in the year ahead.

The exchanges featured in this report share a common characteristic – they are all eager to speak about their accomplishments to date, and their expectations for growth in the future.

Underwriting this confidence is the fact that most exchanges have successfully cut costs, developed their core service offerings, and are currently in the process of increasing their recurring revenues, while continuing to build out their membership bases at the same time. Although some exchanges have had to push back their goals of being profitable in 2002, most expect to become profitable during 2003.

Among the most advanced industry-sponsored exchanges, several have members that are in the process of integrating their back-end systems with their key trading partners via the exchange’s network. A handful of early adopters have already completed such integrations, while others are in the process of accelerating their supplier enablement programs.

Many of these exchanges have also indicated that further improvements to their technology portfolios are planned for 2003.

And finally, adding to their optimism, a turnaround in the economy is widely anticipated to be a significant boost for most exchanges, as prospective members become more open again to participating in new technology initiatives.

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## B. Independent Exchanges

### ChemConnect

During 2002, ChemConnect focused on expanding its network, following the acquisitions of former rival exchange CheMatch and the natural gas and liquids (NGL) exchange platform of Altra Energy. ChemConnect also forged a link with Global Exchange Services' EDI-based network, and in March 2003, it has recently announced another connectivity agreement with the forest products industry exchange, ForestExpress.

ChemConnect breaks down its operations into three main areas:

- Online auctions
- Commodity trading platform
- Connectivity services

In 2002, ChemConnect facilitated more than 1,000 buy- and sell-side auctions, finding that many large suppliers now view sell-side auctions as a supplementary sales channel through which they can reach new and existing customers. Sellers conducted more than 40% of ChemConnect's auctions last year.

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#### Exchange Profile: Number of Users and Transaction Activity Conducted via ChemConnect, 2002

Number of transactions during 2002	16,000
Value of transactions during 2002	\$8.8 billion
Number of individual registered users	30,000

Source: ChemConnect, January 2003

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As mentioned above, ChemConnect spent the first half of 2002 integrating the online commodity markets that it acquired from CheMatch and Altra Energy. Throughout the year, much of ChemConnect's focus was to expand both the amount of product traded via its online marketplace, as well as the number of companies using its trading services. ChemConnect estimates that more than 15,000 transactions were conducted via its marketplace during 2002.

Due to the slow economy, chemicals trade was down in general across ChemConnect's network, with trade in NGLs being hit the hardest. Nonetheless, ChemConnect is optimistic that throughput via its exchange will pick up, with strong upside potential, once a global economic recovery begins.

Building upon its 2001 acquisition of Envera, ChemConnect's connectivity offering has been further developed during 2002, thereby bringing ChemConnect into closer competition with Elemica, a rival chemical industry exchange that has focused on facilitating ERP to ERP connectivity between its members.

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ChemConnect believes that its interoperability agreements with other EDI- and Internet-based networks such as GXS and ForestExpress provide it with an advantage, as its members are able to connect with a wider number of trading partners that lie outside of the chemical industry. ChemConnect's connectivity agreement with GXS permits its members to exchange EDI or XML-based documents with trading partners, regardless of their preferred electronic trading platform.

Looking ahead to 2003, ChemConnect expects its business to grow as users increase their trading activity over its network, and expand their use of ChemConnect's enterprise connectivity solution. A handful of early adopters have said that they expect to channel as much as 40% to 50% of their total purchasing via the Internet by the end of 2003, up from between 20% and 30% in 2002.

The majority of exchange members channeled between 5% and 10% of their total trade via the Internet in 2002, confirming widespread acceptance of Internet-based trade in the chemicals industry. ChemConnect has noted however, that several of these members are not yet ready to expand their use of ChemConnect's services, nor certain of how they should proceed. Helping its members get beyond this phase in their e-commerce development will likely require some time and effort.

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## TransCore

With more than 25 years' experience serving the transportation industry, TransCore is an example of an offline business that has successfully adapted to the changes that the Internet has brought to its industry.

TransCore's traditional business is broken down into two divisions. The first is its automated toll collection services, which accounts for about two-thirds of the company's revenues. The second is its transportation logistics division, which provides software and services to the trucking industry. In early 2001, TransCore acquired DAT Services, which as an independent exchange had developed an online trading platform for the trucking industry.

Through this second division, TransCore serves as an intermediary, helping shippers match and manage loads with trucking companies and individual owner-operators through a multi-channel network of telephone, fax, kiosk and online access points. Users pay a minimum \$300 per month to access TransCore's network, plus an additional \$20 transaction fee for each load they secure thanks to the network's services.

In 2002, TransCore was processing more than 7 million monthly transactions via its entire network, with approximately 2 million of those transactions occurring online. TransCore has also reported an average 15 million Web page views per month, reflecting the number of visitors that log on to browse its regularly updated listings.

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### Exchange Profile: Monthly Transaction Activity Conducted via TransCore's Multi-Channel Trading Network, 2002

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Number of monthly transactions*	7.1 million+
Number of monthly online user sessions	2 million+

*Note: \*across online and offline channels  
Source: TransCore, November 2002*

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Thanks in large part to the development of its Internet capabilities, TransCore has seen annual transaction activity across its entire network grow by a substantial 137% in just three years, from 36.2 million transactions in 1999 to 85.9 million transactions in 2002. The company has continued to see strong subscriber growth, especially as shippers have found it to be increasingly convenient to post loads to TransCore's network via its Internet-based software solution.

As an intermediary that was supposed to have been threatened by B2B exchanges, TransCore serves as an example of how incumbent companies have not only survived, but significantly benefited from the adoption of Internet-based technology. Thanks to TransCore's offline roots, it has easily been able to sustain its business while startup competitors have failed. TransCore has furthermore incorporated the Internet into its own business operations, thereby providing its customers with better service, while at the same time becoming more efficient itself.

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## Inventory Locator Service (ILS)

In a case that is very similar to that of TransCore's, Inventory Locator Service (ILS) has its roots as an offline intermediary, serving as a listing service for aftermarket parts in the aerospace industry – ask anyone in the industry where they would go for such parts, and ILS would be one of the first places they would look.

Originally started in 1979, ILS initially provided a telephone and fax-based directory of aftermarket parts to airplane owners and mechanics, along with government procurement professionals. As early as 1984 ILS incorporated e-mail capabilities as part of its RFQ services, and by 1998, it had begun to conduct online auctions for hard-to-find parts.

Today, ILS maintains an Internet-accessible database of aerospace and marine industry parts, while it has also developed an eRFQ feature that helps users streamline their sourcing processes. A substantial 91% of users currently access the ILS database via the Internet, although it is worthwhile to note that transactions are typically concluded offline, either by telephone or via e-mail.

The network's 3,800 subscribing companies and 10,000 individual users conducted more than 27 million parts searches via ILS during 2002. Among these member companies are 200 airlines and 700 repair facilities, as well as 53 government procurement sites.

### Exchange Profile: Number of Users and Transaction Activity Conducted via ILSmart.com, 2002

Number of subscribing companies	3,800
Number of individual users	10,000
Number of government procurement sites	53
Number of government users	3,000
Number of SKUs listed	50 million+
Number of transactions* per day	43,000 to 46,000

*Note: \*transaction defined as a part search, quote request, inventory message or broadcast message to all subscribers*  
 Source: Inventory Locator Service (ILS), February 2003

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During 2002, ILS saw the number of searches via its network grow by about 11%, and the company anticipates similar growth in 2003. Smaller network members typically pay about \$300 per month in membership fees, while larger users pay anywhere from \$10,000 or more per month, depending on the volume of their business and the services that they use.

Last year ILS expanded its technology offering by providing hosted catalog services and analytic tools that permit users to track industry-wide supply and demand trends for various aviation parts. In 2003, ILS plans to roll out a government bid alert system that summarizes and advises parts suppliers of government tenders.

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Besides the success behind ILS's ability to adapt to the Internet, it is interesting to note its niche between two significant consortia-backed exchanges in the aerospace industry – Exostar and Cordiem. While these two larger exchanges serve both manufacturers and large airline purchasers, their respective technology offerings are primarily targeted at their customers' integrated supply chains.

By contrast, as an aftermarket parts directory, ILS lies outside of manufacturers' and airlines' direct supply chains, and has been able to continue in its role as a directory service. As for the possibility that either industry exchange may one day move in on its territory, ILS is confident that the investment it has made in developing its online content would be excessively costly for either exchange to replicate. Rather, it is more likely that in the future, industry-sponsored exchanges may eventually prefer to partner with ILS by building links out to its network.

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## Global Wine and Spirits

Global Wine and Spirits (GWS) is unique among independent exchanges, not only as a start-up that has managed to survive, but also as a latecomer to the B2B community – Global Wine and Spirits opened in 1999, but did not begin to trade products online until May 2001.

Based in Montreal, Quebec, GWS divides its operations into two segments – a public eMarketplace and a division called Global Wine and Spirits Business Solutions.

After nearly two years of online operations, the public eMarketplace has 850 sellers and 680 buyers subscribing to its services. An additional 75 wine and spirits agencies are also members. A one year subscription to the GWS public marketplace costs \$1,395 USD.

The main capabilities of the exchange include its role as an online directory of supplier catalogs, as well as a central marketplace to which buyers can post requests for tender. Purchase orders are not issued electronically via the public eMarketplace, although GWS does offer this capability to customers of its business solutions division.

During 2002, 5,250 purchase orders were filled via the Global Wine and Spirits public eMarketplace, accounting for approximately 30 million bottles, worth a total \$95 million. GWS has noted that since September 2002, sell-side activity via its marketplace has increased significantly.

### Exchange Profile: Number of Users and Transaction Activity Conducted via Global Wine and Spirits' Public Exchange, February 2003

Number of supplier members	850
Number of buyer members	680
Number of international calls for tender (past 6 months)	248
Number of total tenders (past 6 months)	945
Number of spot market place offers (past 6 months)	283
Number of recorded transactions* during 2002	5,250
Value of recorded transactions during 2002	\$95 million

*Note: \*transaction defined as having originated via the exchange, but PO's have not been issued electronically*

*Source: Global Wine & Spirits, February 2003*

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The Asia-Pacific region, followed by Scandinavia, the United Kingdom, Germany and Canada are the largest buy-side markets using Global Wine and Spirits' public marketplace. Not surprisingly, suppliers from France, Italy, Portugal, the United States, Australia and South Africa are the largest sell-side markets.

Launched in April 2002, Global Wine and Spirits' Business Solutions division helps members develop their own private buy- or sell-side portals that can be integrated with their back end systems.



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The first buy-side portal was launched by the Societe des alcools du Quebec (SAQ) in September of 2002 with considerable success – by February 2003, the SAQ announced that 100% of its purchasing is being conducted electronically, using a combination of GWS services, including its private portal, internet-EDI translation services, as well as the public eMarketplace.

Looking ahead to the future, GWS is targeting as many as 200 large wine and spirits buyers from around the world, which it believes will benefit from its private portal solution. As for its competition, Global Wine and Spirits notes that during the 2001 London Wine Fair, there were 14 companies selling industry specific e-business solutions. In 2002, 13 were no longer there.

Global Wine and Spirits has survived, in part, by taking a slow and steady approach to building its business. It has also succeeded thanks to the support of its technology platform vendor, MediaGrif Technologies, which holds a 45% ownership stake in Global Wine and Spirits.

This platform has been critical in developing what has emerged as a leading online content management solution for the wine and spirits industry. Among its many features, the exchange platform permits suppliers to post custom catalogs for separate national markets or individual trading partners, thereby bringing greater efficiency to their marketing operations.

Executives from GWS also credit their early success to the company's focus on customer service, which has enabled them to expand their membership base to more than 60 countries. Although nearly all requests for tender and catalog postings are channeled online, GWS has nurtured the use of its public exchange by proactively monitoring and matching online tenders with prospective suppliers.

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## Farms.com

Farms.com is yet another startup exchange that has managed to survive while several of its competitors have fallen by the wayside. Indeed, Farms.com has not only managed to survive, it is also profitable.

The marketplace and e-business solutions vendor divides its business into three major components:

- Trading/online marketplace
- Custom software for the swine industry
- E-business services

The first two segments of Farms.com's business account for approximately 40% of revenues each, while its e-business services segment brings in an additional 20% of company revenues.

The trading operation of Farms.com combines traditional offline brokerage services with an online marketplace where buyers and sellers can offer and respond to bids. Not unlike former competitor eMerge Interactive, Farms.com has also rolled out an online auction capability with mixed success – cattle and swine auctions are now conducted once every two weeks, with three or four lots closed per auction.

Offline brokerage services for both cattle and swine continue to do well however, and provide the majority of revenues within this segment. Farms.com's brokerage business, M&F Trading, frequently acts as a counter-party to trades, using the Farms.com trading platform as part of its internal information system.

Like many other commodity-based exchanges, Farms.com quickly understood that transaction revenues would not provide it with enough revenue to sustain its business. But as other agricultural industry exchanges began closing down around it, Farms.com started to make acquisitions, purchasing five different software solutions that have helped it create a package of Web-based supply chain and knowledge management software, tailored especially for the swine industry.

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### Exchange Profile: Number of Users and Transaction Activity Conducted via Farms.com, February 2003

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Number of swine marketed online each week	30,000
Number of hosted software solutions users (user seats)	4,000-5,000
Number of users logging on to Farms.com Web site each day	7,500

Source: Farms.com, February 2003

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These hosted solutions permit users to track and manage everything from their swine holdings to the feedstock and other materials that are necessary for raising swine. Farms.com's solutions are sold as knowledge management tools for the swine industry, as they also help farmers analyze sales and purchasing data. According to Forbes.com, about 4 million of the 7.5 million swine in the United States are tracked using Farms.com's

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solutions, with companies paying between \$25 to \$50 per month to use its various hosted solutions.

The e-business unit of Farms.com sells a range of products and services, from custom e-mail newsletters to advertising space on the Farms.com Web site. Costs have stabilized for this division now that the company Web site has been built, while revenues are growing. The number of subscribers increased by 100% during 2002, and a further 150% increase is projected for this year.

As of February 2003, there are currently 7,500 regular users who log on to the Farms.com Web site each day. Farms.com publishes a variety of newsletters, such as a risk management e-mail newsletter that subscribers may buy for \$240 per year. Another revenue generator is Farms.com's careers listings, to which companies can post job offers for \$199 per month. Online advertising brings in a steady revenue stream as well, with Farms.com selling advertising space to as many as 150 regular sponsors and advertisers.

During the past nine months, Farms.com has noted a significant increase in sales of its hosted solutions to large farm operators in particular. As for smaller farmers, Farms.com has found that most are regular e-mail users and many have begun to accept the Internet as a marketing and communications channel. There is, however, a great deal of confusion over technology standards in the industry.

Looking to the future, Farms.com plans to play a role in developing technology standards on the buy side of farm operations. As for the sell-side of food retailing, Farms.com believes that Wal-Mart will eventually play a significant role in setting standards and driving technology adoption among both large and small farmers.

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## C. Industry Sponsored Exchanges

As part of eMarketer's coverage of leading industry-sponsored exchanges, a common thread has emerged among the five that we spoke with – each of them is in the process of moving beyond the early stage of their development, toward truly integrated business-to-business e-commerce.

The first phase of exchange development has required a 'lighter' commitment on the part of members, as most companies have simply been logging on to Web-based catalog directories or participating in online auctions. But in the next phase of integrated e-commerce, the necessary server-to-server connections between businesses require a greater commitment, in the form of both internal preparation and further investment on the part of exchange members.

Leading business-to-business exchanges are now moving their members into this advanced stage. In preparation for this, it has taken most exchanges as many as three years to develop their e-business platforms. Many have also needed time to determine how to streamline the process of bringing their members' smaller trading partners on board.

During 2002, several of these leading exchanges were focused on getting a handful of early adopters up and running. In 2003, their goal is to significantly increase the number of integrated trading partners that are using their networks.

Please see the Appendix for a comprehensive breakdown of the estimated cost to build an industry-backed exchange.

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## Open Network for Commerce Exchange (ONCE)

Formerly known as the Global Trading Web Association, the Open Network for Commerce Exchange (ONCE) received its new name in September 2002. As a non-profit organization, its mission is to assist in the development of an interoperable network of B2B exchanges, so that any exchange member may connect with any of its trading partners through a single network of B2B exchanges.

As mentioned at the beginning of this chapter, ONCE has also emerged as a leading advocacy group on behalf of all B2B exchanges. In addition to this role, ONCE provides a forum where member exchanges are able to meet and share best practices, as they build out their own industry-specific trading networks.

Through the first half of 2002, ONCE members processed in excess of 1.1 million online transactions, trading an estimated \$3.3 billion worth of goods and services online. Year over year transaction volume increased by a weighted average 69% among the 18 survey respondents, while the dollar value of online transactions grew by a weighted average 124%.

### B2B E-Commerce Trade among ONCE Member Exchanges, January-June 2002

Dollar value of online trade	\$3.3 billion
Number of transactions	1.1 million+

*Note: 18 Open Network for Commerce Exchange (ONCE) member exchanges reporting*

*Source: Open Network for Commerce Exchange (ONCE), November 2002*

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Member exchanges include Exostar, Quadrem, ForestExpress, eScout, Pantellos, Hubwoo and CPGMarket.com, among others. ONCE has several technology partners as well, including Commerce One, webMethods, PeopleSoft, and SAP. Membership fees range from \$25,000 for an exchange with voting rights in ONCE to \$1,000 for an individual.

Looking ahead to 2003, more than 90% of ONCE members said that their primary goal is to break even or to become profitable.

As for their investment plans, most exchanges said that their technology spending in 2002 had been lower than in previous years, although they expected to continue to invest in hardware expansion and upgrades, security and disaster recovery, software integration tools and content management in 2003.

In light of the reported difficulties that exchanges have had in signing up new members during 2002, ONCE plans to help its members develop case studies that highlight the cost savings and ROI benefits that individual exchange users have so far achieved.

ONCE will also be developing a trading partner directory in 2003, so that member companies can see which of their trading partners may be accessing the ONCE network from other exchanges.

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## Covisint

Due to persistent stories of supplier resistance to joining its exchange, along with an abrupt change in CEOs in June 2002, Covisint has been held up by some observers as an example of how industry sponsored exchanges are continuing to struggle. After reviewing Covisint's accomplishments to date, eMarketer has found that nothing could be further from the truth.

Covisint divides its portfolio of technology solutions into three main segments:

- Connectivity solutions
- Quality management solutions
- Procurement solutions

Covisint's connectivity solutions presently include its portal offering, which has been steadily improved over the past three years, and is now on its third version. Thanks to this portal offering, individual users are able to log on to Covisint's central portal one time with a single password, which in turn permits them to access private portals or other areas of Covisint's Web site to which they have rights.

Within each manufacturer's private portal, suppliers are able to access as many as 50 to 100 different software applications, the majority of which are legacy systems that suppliers have been using for several years. Most of these legacy applications are equipped with a Web interface that makes them accessible via Covisint's portal solution, as are those Web-based solutions that Covisint offers, that manufacturers have chosen to adopt.

In 2001, Delphi was the first manufacturer to use Covisint's solution to develop its own private portal. Delphi began to bring its supplier base on board in early 2001, and had enabled close to 100% of its suppliers by year's end. Daimler-Chrysler, Ford and the Lear Corporation have all initiated their own private portals as of Q4 2002, and have nearly completed their supplier enablement programs as of early March 2003, with similar success.

Suppliers have appreciated the benefits of having to sign on only once, in order to access Covisint's public and private portals, and have needed few inducements to do so. As of December 2002, Covisint estimates that it had more than 77,000 individual users logging on to its network, up from just under 22,000 in December 2001. Approximately 14,000 of the 30,000 companies in the automotive industry have access to its network, according to Covisint.

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### Exchange Profile: Number of Registered Users with Access to Covisint's Network, 2001 & 2002

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#### Number of individual users, December 2001



21,796

#### Number of individual users, December 2002



77,058

Source: Covisint, February 2003

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Although Covisint has been rather tight-lipped about further connectivity offerings, there is another Web-based tool that is due to be released in April of 2003. Described as a hub that will permit information exchange between suppliers, eMarketer would speculate that this coming solution may serve as an internet-based alternative to EDI.

Turning to Covisint's quality management solutions, Covisint offers an Advanced Quality Planner (AQP) tool and a Problem Solver tool.

The former solution gathers engineering data and related information on thousands of individual products and parts, including each part's design history and subsequent modifications. By storing this information electronically, Covisint's solution substantially reduces paper filing, while at the same time making information retrieval much faster. Furthermore, all of the leading OEMs have agreed to standardize on Covisint's AQP solution.

The Problem Solver tool helps reduce production delays that occur due to unexpected problems – a car engine not fitting into a vehicle's frame, for example – that may shut down an entire production line, often at a cost of millions of dollars per day. By helping to coordinate the resolution of such problems among multiple suppliers, valuable time can be saved. Covisint hopes that the automotive industry will agree to standardize on its Problem Solver solution in the near future.

According to data provided to Covisint by AMR Research, Covisint's Problem Solver solution could save the industry between \$6 billion and \$8 billion per year, while Covisint's AQP solution could save another \$3 billion to \$4 billion through the improved communication of design changes.

**Exchange Profile: Potential Cost and Time Savings to the Automotive Industry via Covisint's Solutions, 2003**

Annual cost to manage quality processes	\$6 billion to \$8 billion
Annual cost of excess inventory due to poor communication of design changes	\$3 billion to \$4 billion
Annual cost to administer parts warranties	\$2 billion to \$3 billion
Number of days lost due to offline RFQ dissemination and response collection	30 days
Percent of product development time consumed by the need to wait for design partners' responses	25%

Source: AMR Research, January 2003

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Ever since its much-publicized founding, Covisint's e-procurement solutions have garnered the most attention. Covisint currently offers four separate solutions:

- Forward and reverse auctions
- Online catalogs for indirect and MRO goods
- eRFQ tool for contract buying
- Quote manager tool for engineered parts (in beta testing)

Although Covisint's auction solutions still account for roughly half of its revenues, the exchange expects that auctions will bring in less than 20% of its total revenues within the next few years, as adoption of other solutions proceeds.

And while outsiders have focused on Covisint's reliance upon its auction solutions for the bulk of its revenues to date, Covisint would counter that such solutions have served a useful purpose by providing members with a quick return on their initial investments in Covisint. By bringing users on board with these basic solutions, Covisint has been able to further develop other more complex solutions, which it is now in the process of rolling out to its members.

When it comes to measuring the benefits that users of its eRFQ solution have received, Covisint has found that the greatest savings have been through improved productivity, rather than substantial reductions in product costs. For example, in the past, several clerks took days to assemble what has been described as "mountains of data", in order to prepare RFQ documents. By making much of this information available online, information retrieval is much faster, while response times have also been substantially reduced thanks to eRFQs.

Over the long term, Covisint believes that the adoption of some of its solutions will take as many as 5 to 10 years. Its AQP solution, for example, is gradually being introduced into the design phase of manufacturers' new initiatives, but since current design projects may remain active for 5 or more years, it will take some time to retire legacy systems.

In a broader context, Covisint sees its role in the automotive industry as having two components. First, it is taking a leading role in the facilitation of internet-based connectivity throughout the industry, largely through its central location as Web-based portal that facilitates greater integration between manufacturers and suppliers within the industry.

Second, Covisint is playing a critical role as a facilitator of standardization – not only of technology standards, but more importantly, within the realm of process standards. Its auction, catalog and AQP solutions and their related processes have already been accepted as standards within the industry, which in turn reduces the burden on suppliers to adopt multiple technologies, and related business processes.



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## E2open

Compared with other industry-sponsored exchanges, E2open currently has what may be the largest number of members using fully integrated, collaborative e-business solutions, connecting one company to another, server-to-server. E2open has attributed this leadership, in part, to the high level of technical readiness among companies in the electronics industry.

Its members are presently using product lifecycle management (PLM), vendor managed inventory (VMI) and collaborative demand/supply planning solutions. IBM and i2 Technologies are the primary technology providers to E2open, and they are both key channel partners in their capacity as resellers as well.

As of early 2003, E2open had six leading electronics manufacturers hosting their private e-commerce hubs on its network. These manufacturers include Seagate, Hitachi and Solectron, in addition to three other unnamed OEMs. In total, 2,000 of these firms' trading partners are connected via E2open's network, with 25% to 30% of those partners engaged in fully integrated online trade with their OEM trading partners.

Solectron, for example, is processing more than one million transactions per month via E2open's network, connecting 15 of its own factories with about 400 of its trading partners. As of early 2003, Seagate is processing about one million transactions via E2open as well.

In terms of the savings that its members have achieved so far, E2open estimates that one manufacturer reduced its total cost of ownership for its private hub by as much as 50%, thanks to its use of E2open's hosted solutions.

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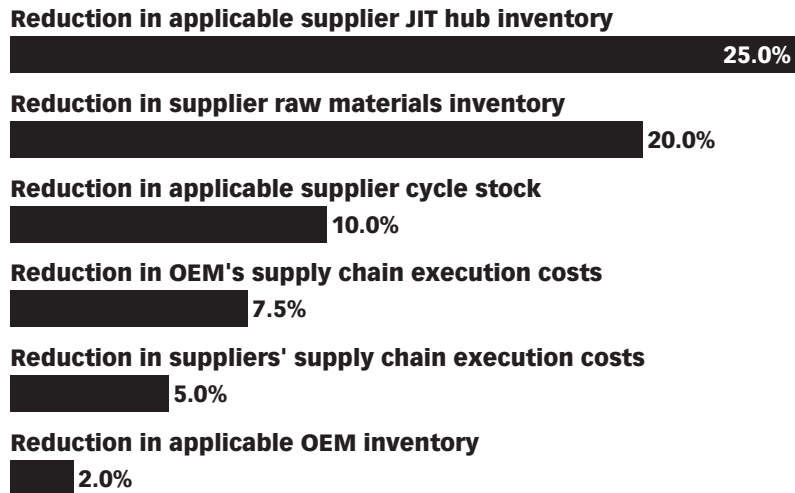
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In another case study, an unnamed hardware OEM has reduced its supply chain execution costs by 7.5%, while at the same time reducing its supplier just-in-time (JIT) hub inventories by 25%, thanks to improved supply chain coordination. Its suppliers, in turn, have reduced their raw materials inventories by as much as 20%, and reduced their own supply chain execution costs by 5%.

**Exchange Profile: Benefits Achieved by a Major Hardware Manufacturer's Use of E2open's Collaborative Demand/Supply Planning Solution, 2002**



Source: E2open, January 2003

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E2open's success at integrating so many trading partners via its network has been a result of its efforts to streamline and automate its onboarding process.

Supported by a central trading partner directory that monitors the electronic trading capabilities of each member company, E2open knows exactly which suppliers are RosettaNet ready, or require EDI-based connections. E2open also uses a trading partner test harness that automatically verifies new server-to-server integrations, first for connectivity, and then for data integrity.

For smaller trading partners, E2open offers a Web services gateway, which helps them access E2open's solutions without having to invest in a costlier integration server. Small trading partners typically pay monthly transaction fees of between \$50 and \$250 per month, per user, depending on the solutions that they use.

As more trading partners get signed up over the coming months, and as its largest customers expand their use of its hosted solutions, E2open expects to be profitable by late 2003.

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## Exostar

Between 2000 and 2002, aerospace industry exchange Exostar has taken a slow but steady approach to building its technology platform. Over the past three years, Exostar has kept its focus on the direct procurement and supply chain needs of its largest members, and it has taken its time developing a portfolio of technology solutions that meet their needs.

In early 2003, much of the early development work is now complete, and Exostar expects to see significant growth during the coming months.

Buyers are ready to switch much of their purchasing over to Exostar's network, and tier one suppliers will be encouraged to more closely integrate their systems with their smaller trading partners via Exostar.

Exostar has three main technology offerings, all of which have received significant upgrades during 2002:

- SourcePass 5.0
- ProcurePass 5.0
- ForumPass 2.0

SourcePass is Exostar's auction tool, which in late 2002 was processing more than 100 online auction events per month. In mid-December, Exostar estimated that approximately \$1.5 billion worth of goods had been transacted via its SourcePass solution during 2002.

Initially scheduled for release in the third quarter of 2002, Exostar has instead released the fifth version of its e-procurement solution in March 2003. Indicative of Exostar's emphasis on product quality over rapid time-to-market, ProcurePass 5.0 was delayed at the request of Exostar's largest buyers, which had asked for further features to be added to the solution's latest version.

ProcurePass 5.0 is now able to process 11 different electronic documents, up from its initial four - purchase orders (POs), PO acceptances, PO changes and invoices. Included among the new transaction capabilities are advanced scheduling notices (ASNs), invoice reports and goods received reports. Each of these electronic documents has been customized for the aerospace industry, with as many as 500 separate data fields within a single PO. By comparison, a typical PO for most other industries has an average 80 data fields.

ForumPass is Exostar's collaborative design solution, which as of December 2002 had as many as 50 companies paying for 600 individual user seats. Exostar believes that usage of its internet-based collaborative solutions will increase significantly during 2003, thanks in part to new features that incorporate digital certificates for added security.

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As of late 2002, Exostar had approximately 12,000 registered suppliers with access to its network, each paying an annual membership fee of just under \$400 per year. By the end of 2003, Exostar is aiming to have as many as 20,000 suppliers on board, representing just under half of the addressable market of 45,000 trading partners within the aerospace industry.

**Exchange Profile: Number of Users and Transaction Activity Conducted via Exostar, 2002**

Number of auction events during 2002	1,300
Number of registered suppliers	12,000
Number of weekly transactions	20,000
Number of collaborative solutions users	600 users, 50 organizations

*Source: Exostar, February 2003*

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It is worthwhile to note, however, that very few suppliers have installed integrated, server-to-server connections with large buyers via Exostar's network. Most are only able to access Exostar's network through a Web browser, meaning that any information they receive via Exostar must be re-keyed into their back end systems.

However, as mentioned above, Exostar has placed a priority on meeting the needs of its largest members and their tier one suppliers. Indeed, most industry leaders have needed 12 to 18 months just to prepare themselves for integration with Exostar's network.

A few large buyers have now installed XML-based gateways behind their own firewalls, connecting their back end systems with Exostar's procurement solution. Approximately 20,000 electronic transactions are being processed via Exostar's network each week, as of February 2003.

BAE Systems, for example, completed its back end gateway in September 2002, and is currently in the process of rolling out Exostar access across its various divisions. Lockheed Martin has been awaiting the release of ProcurePass 5.0, prior to beginning the process of retiring its private legacy network, SupplierNet, in favor of Exostar.

In early 2003, a handful of early adopters are channeling as much as 30% to 40% of their purchasing through Exostar's network. Eventually, Exostar's founders plan to channel 100% of their direct procurement via the exchange.

Exostar estimates that about 60% of the transactions that crossed its network during the third quarter of 2002 were for indirect procurement goods and services, with the remaining 40% being for direct procurement. By the end of 2003, Exostar projects that more than 70% of its throughput will come from direct procurement transactions. Exostar is aiming to be profitable by the first quarter of 2004.

It is interesting to note that representatives of Exostar attribute their exchange's success to its members' clear focus on the development of solutions that bring greater efficiency to their direct supply chains.

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Although the founding members each view supply chain management as a critical element of their own competitive advantage, they quickly understood that because there was so much overlap within the aerospace industry, there would be a considerable benefit to each of them if they mutually developed solutions that would make the entire industry supply chain more efficient.

As a result, Exostar has been able to proceed with its focus on developing quality solutions, and is now quite confident about its future.

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## GlobalNetXchange

Since it first opened in February 2000, GlobalNetXchange (GNX) has hosted more than 9,500 online auctions, worth a total \$7.5 billion. In 2002, its retail industry members conducted 6,600 auctions, which were valued at \$5.1 billion.

### Exchange Profile: Quarterly Transaction Activity Conducted via GlobalNetXchange, Q1-Q4 2002

	Number of auctions	Estimated value (in millions)
Q1 2002	1,000	\$700
Q2 2002	1,550	\$1,050
Q3 2002	1,750	\$1,200
Q4 2002	2,200	\$2,000

Source: GlobalNetXchange, November 2002

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GlobalNetXchange divides its business into four segments:

- Online sourcing and negotiations (auctions)
- Collaborative solutions
- Online exchange platform for perishable goods
- Catalog solutions

Well-suited to the sourcing and buying patterns of the retail industry, retailers have embraced online auctions as an effective means of streamlining the process of negotiating long-term contracts for merchandise that is to be resold in their stores. GNX estimates that approximately 80% of the auctions processed via its exchange are for resale goods, with the remaining 20% being used for indirect and MRO goods.

Retailers have found that the online auction tools offered by GNX have improved their purchasing departments' productivity significantly, while at the same time permitting them to negotiate better prices for large order contracts. As a result, companies like Sears, Roebuck have increased the size of their average auction purchases from \$20,000 in 2000 to more than \$1 million today.

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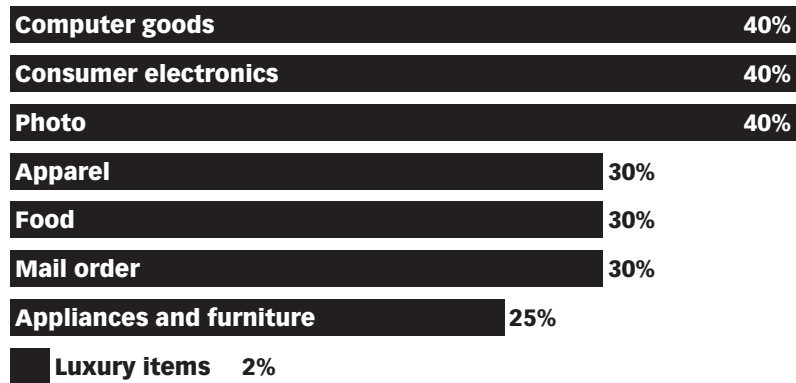
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GNX estimates that its members could potentially channel an average 30% of their total resale goods purchasing via online auctions. Some product categories are more conducive to being purchased through online auctions than others however, with as much as 40% of computer products and consumer electronics to be channeled online. Soft goods such as apparel lines are just starting to be more frequently purchased via GNX auctions.

**Exchange Profile: Percent of Goods for Resale that Retailers Can Purchase via Online Auction, by Category, 2003**



Source: GlobalNetXchange, February 2003

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In evaluating the use of its auctions, GNX has discovered that mature products with growing purchase volume and commodity-like characteristics are most easily channeled online. Furthermore, auctions produce the best returns when there are five or more potential suppliers of a given product line. Branded products, or goods that are highly customized or uniquely designed are less readily sourced via an online auction.

Once a contract order is completed, it will in most cases be fulfilled over an extended time period. To help facilitate better coordination between retailers and their suppliers, GNX offers a hosted collaborative planning forecasting and replenishment (CPFR) solution from Manugistics.

At the end of 2002, GNX had 23 live CPFR installations on its platform, with six retailers and 17 of their trading partners using the solution across 200 locations worldwide. In total, GNX members were monitoring 2,000 SKUs and 100,000 planning items.

After the first full year of CPFR collaboration between Sears, Roebuck and Michelin, both companies reported a high degree of satisfaction with their pilot project. Sears reported a 16% reduction in distribution center inventory levels and Michelin saw a 20% reduction in its own warehouse inventory. Sears also estimates that it benefited from an additional

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\$140,000 in margin dollars, thanks to proactive follow-up to exceptions that reduced out-of-stock situations and missed sales.

By the end of one year, Sears and Michelin had expanded their trial from 70 SKUs to all 220 product SKUs that Michelin sells to Sears. Each company is currently in the process of expanding their use of CPFR with other trading partners.

**Exchange Profile: Measured One-Year Benefits of Sears-Michelin CPFR Program, 2002**

Improvement in Sears' in-stock levels	4.3%
Reduction in Sears' distribution center inventory	16.0%
Reduction in Michelin's warehouse inventory	20.0%
Improvement in Michelin's fill-rate to Sears' distribution centers	10.7%
Improvement in product turnover at Sears' stores and distribution centers	15.0%
Savings generated by proactive follow-up to exception reporting	\$140,000

Source: *GlobalNetXchange, Sears, September 2002*

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GNX offers another collaborative solution called collaborative product development (CPD), which is designed to help grocery retailers manage the development of their own private-label food products. UK-based J.Sainsbury is presently using the solution with more than 500 of its suppliers, with more than 900 items in development. GNX's CPD solution facilitates information sharing and collaboration among those trading partners involved in the development and production of food products, from ingredients suppliers to packaging companies.

By the third quarter of 2003, GNX expects to release a third collaborative solution that helps retailers track supplier performance. The solution permits retailers to share information with their trading partners, so that they can set performance benchmarks and track their ability to meet such goals.

The Kroger Company is currently the only GlobalNetXchange member using GNX's perishables exchange solution, which is a trading platform that brings together spot prices for perishables products. More than 500 of Kroger's suppliers regularly submit prices to Kroger's private portal, which serves as its primary sourcing tool. GNX is currently offering this private exchange tool to other grocery retailers in North America.

And finally, GNX is continuing to work with CPG industry exchange Transora, along with UDEX and UCCnet as they collectively develop standards that will help retailers and manufacturers synchronize product data across their separate catalogs. Although GNX believes that data standards may take another two years or more to develop, it sees considerable potential for its catalog applications once such standards are established.



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At present, GNX is piloting its own catalog solution that provides retailers with an interface to the global data synchronization network. One retailer and a major manufacturer are participating in the pilot, which is scheduled for completion in the third quarter of 2003.

Overall, GNX is confident about its future, as it is in good financial condition in early 2003. Although it has not confirmed when it expects to become profitable, GNX has indicated that profitability is not far off, especially in light of the fact that it expects business to double by the end of 2003.

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## Quadrem

Serving the mining, minerals and metals industries, Quadrem initially opened in May 2000 with 14 founding members. As of late 2002, it had almost 2,200 trading partners accessing its network, 214 of which are fully integrated buyers using server-to-server connections with the exchange. A further 30 to 40 suppliers are also integrated with Quadrem's network, with the exchange aiming to bring another 100 integrated suppliers on board by the end of 2003.

### Exchange Profile: Number of Trading Partners and Products Accessible via Quadrem's Network, 2002

Number of trading partners	2,195
Number of suppliers	1,981
Number of trading partners transacting	997
Number of connected buying locations	214
Number of catalogs	492
Number of available line-items	1.4 million+

Source: Quadrem, December 2002

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In addition to its success at integrating members with its network, it is worthwhile to note that Quadrem has also helped bring e-commerce connectivity to mining sites throughout the world, with strong participation among buyers and suppliers alike in such diverse countries as South Africa, Chile, Canada and Australia.

In terms of the dollar-value of transactions that are being conducted across its network, Quadrem estimates that \$400 million worth of products were traded via its exchange in 2002. Quadrem's largest buyers have committed to channeling at least \$1.5 billion worth of transactions via the exchange in 2003.

At present, leading buyers are directing as much as 10% to 15% of their total spending through Quadrem's network, while some have a stated goal of eventually sending 100% of their purchasing through the exchange.

### Exchange Profile: Dollar Value of Transaction Activity via Quadrem's Network, 2002 & 2003 (in billions)

2002	\$0.40
2003*	\$1.50

Note: \*value of throughput that buyers have committed to for 2003

Source: Quadrem, December 2002

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Over the past three years, Quadrem has expanded its technology platform from its initial catalog-based procurement solution to become an integrated system that automates much of the source-to-pay process.

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Using the Quadrem Electronic Sourcing Tool (Quest), integrated buyers can initiate an RFQ from their back-end ERP systems, which is then routed via Quadrem's marketplace to its supplier community. Quest permits a buyer to set specifications and select suppliers in advance, while suppliers are then automatically alerted that they have been invited to participate in an RFQ. The Quest solution provides suppliers with the opportunity to respond with either a detailed or "quickbid" reply.

Still at an early phase in their adoption, these RFQs have been generating an average 4.5 responses, thanks in part to Quadrem's proactive prompting of interested suppliers. Quadrem is aiming to increase the response rate to an average 6 replies per RFQ, or more.

After all of the replies have been gathered, Quest also provides buyers with decision support tools so that they may assess individual bids. Quest then permits a buyer to award a contract and then alert its own ERP system, so that a purchase order (PO) may be generated. The PO is then transmitted via Quadrem's marketplace back to the supplier, while all further transaction-related documentation, from advanced shipping notices (ASNs) to invoices, is also handled by Quadrem's marketplace solution. In the end, Quadrem is able to reconcile the final invoice to the initial purchase order, which is a popular feature among users.

Interestingly, final payments are typically handled by the buyer's regular bank clearing mechanism, as the more significant pain points in the procure-to-pay cycle are addressed by Quadrem's marketplace solution.

On the supply side, Quadrem is set to release SupplyCentre in the first quarter of 2003. This hosted solution is designed to consolidate the management of electronic documents onto a single supply-side user interface. The solution will permit suppliers to exchange a whole range of documents with their trading partners via Quadrem's hosted solution, from PO's, to order status requests, ASNs and invoices.

To help sellers integrate their back end systems with its network, Quadrem offers an integration solution called Direct.connect.

On the buy side, once a buyer becomes a member, Quadrem handles the mapping of its own exchange solution to the buyer's back-end ERP system. Quadrem also helps buyers identify and integrate specific suppliers that they would like to trade with via Quadrem's network.

Typically, a new buyer will pilot one purchasing location and a handful of suppliers during a two to three month trial period. From there, some buyers choose to move ahead with a company-wide implementation across multiple buying locations, while others choose to proceed more slowly by enabling 3 or 4 buying locations at a time.

Looking ahead to the coming months, Quadrem is continuing to focus on increasing its members' throughput via its exchange, while at the same time focusing upon helping more buyers and suppliers integrate with its network. It is also helping its members measure the ROI that they have achieved to date through their use of its solutions.

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## A. Costs to Build Exchanges

According to a comprehensive estimate that was assembled by *Baseline* magazine, the one-year cost to build and operate an industry-sponsored B2B exchange is \$93.7 million.

These calculations are based upon a hypothetical exchange designed to serve a group of enterprises that plan to run \$40 billion worth of goods and services transactions through the exchange's network. The exchange would provide supply chain services to a network of approximately 50 suppliers, dealers and distributors and would process about 8 million transactions per year.

Among the other services offered by the exchange would be online catalog creation, electronics funds transfers, contract management and professional services.

The hypothetical exchange would be able to accept and send orders formatted in XML, EDI x.12 standard or plain text, with each participant being responsible for mapping its own internal systems to a vocabulary based on the ebXML framework.

### Estimated Cost to Build an Industry-Backed Exchange, 2002

Startup costs for applications	\$6,646,693
Startup costs for infrastructure	\$1,502,538
<b>Total startup costs</b>	<b>\$8,149,231</b>
Operating costs for applications for one year	\$85,389,450
Operating costs for infrastructure for one year	\$233,528
<b>Total one year maintenance costs</b>	<b>\$85,622,978</b>
<b>Total startup and operating costs for one year</b>	<b>\$93,772,209</b>

Source: *Baseline*, July 2002

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Item	Description	Quantity	Total
<b>Base software</b>			<b>\$1,101,250</b>
Application server	IBM Web Sphere version 4.1 Enterprise	5	\$656,250
Database	IBM DB2 universal database	5	\$75,000
Web server	Apache	6	–
Integration server	GE Enterprise System	2	\$300,000
Messaging software	IBM MQSeries	Bundled with Web Sphere	–
Reporting tools	Brio intelligence 6.6		\$70,000
<b>Electronic marketplace software</b>			<b>\$1,232,500</b>
Order and invoice management	Ariba marketplace	3	\$562,500
Authentication/security management	Entrust	2	\$120,000
Electronic funds transfer	eFunds	1	–
Catalog creation and management	Trigo Product Center for eCommerce	1	\$100,000
Contract management	Ariba contracts	3	\$450,000
<b>Development</b>			<b>–</b>
Development tool	IBM VisualAge for Java		–
<b>Software maintenance</b> (during development)			<b>\$747,038</b>
<b>Labor</b>			<b>\$3,169,678</b>
Business staff		16	\$639,895
Consultants		6	\$1,395,000
Project management		9	\$495,183
Developers		9	\$639,601
<b>Facilities/Equipment or rent</b> (prior to launch)			<b>\$135,000</b>
<b>Training</b>			<b>\$102,743</b>
<b>Corporate overhead chargeback</b>			<b>\$158,484</b>
<b>Total</b>			<b>\$6,646,693</b>

Source: *Baseline, July 2002*

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Item	Description	Quantity	Total
<b>Production hardware</b>			<b>\$216,734</b>
Application servers	Dell PowerEdge 2650	2	\$29,426
Database servers	Dell PowerEdge 2650	2	\$29,426
Web/FTP servers	Dell PowerEdge 1650	6	\$59,418
Messaging and security server	Dell PowerEdge 2650	2	\$29,426
Integration server	Dell PowerEdge 2650	2	\$29,426
Operating systems	Red Hat Linux; MS Windows 2000 Advanced Server	Bundled with hardware	–
Backup production servers	Dell PowerEdge 1650	4	\$39,612
<b>Development hardware</b>			<b>\$75,732</b>
Servers	Dell PowerEdge 1650	4	\$39,612
Developer desktops and laptops	Dell Precision Workstation	14	\$36,120
Operating systems	Windows 2000 Professional	Bundled with hardware	–
<b>Hardware maintenance</b> (during development)	Various	Included in purchase price	–
<b>Network infrastructure</b>			<b>\$601,660</b>
Routers	Cisco 2600	4	\$12,600
Firewalls	Cisco PIX 515	3	\$18,900
Load balancers	Cisco LocalDirector	6	\$30,000
Data storage	StorageTek SVA	1	\$400,000
Tapes	Maxell	350	\$35,000
Monitoring utility	Tripwire for network devices	1	\$8,830
Backup network system	Various		\$93,330
<b>Telecom links</b> (setup)	AT&T, 45 Mbps	2	<b>\$3,000</b>
<b>Network maintenance</b> (during development)	Various		<b>\$135,374</b>
<b>Labor</b>			<b>\$386,227</b>
Business staff		16	\$71,099
Consultants		6	\$155,000
Project managers		9	\$55,020
Technology staff		11	\$105,108

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<b>Facilities/Equipment or rent</b> (prior to launch)	<b>\$67,500</b>
<b>Corporate overhead chargeback</b>	<b>\$19,311</b>
<b>Total</b>	<b>\$1,502,538</b>

Source: *Baseline, July 2002*

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Item	Description	Quantity	Total
<b>Licensing fees</b>	Various		<b>\$2,885,000</b>
<b>Software maintenance charges</b>	Various		<b>\$650,100</b>
<b>Service and usage fees</b>	eFunds, Trigo		<b>\$80,300,000</b>
<b>Training</b>		<b>31</b>	<b>\$33,379</b>
<b>Labor</b>			<b>\$1,520,971</b>
Business staff		16	\$183,940
Consultants		3	\$427,500
Project management		7	\$409,943
Developers		8	\$499,588
<b>Total operating costs (first year)</b>			<b>\$85,389,450</b>

Source: *Baseline, July 2002*

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**Estimated Cost to Build an Industry-Backed Exchange (Ongoing Operations: Infrastructure), 2002**

Item	Description	Quantity	Total
<b>Maintenance</b>			<b>\$124,299</b>
Hardware and network maintenance	Various		\$94,299
Bandwidth charges	AT&T 45-Mbps links	2	\$30,000
<b>Labor</b>			<b>\$109,229</b>
Business staff		16	\$9,681
Consultants		3	\$22,500
Project managers		7	\$21,576
Technology staff		10	\$55,472
<b>Total operating costs (first year)</b>			<b>\$233,528</b>

Source: *Baseline, July 2002*

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