eMarketer™

The eCommerce: B2B Report™

February 2001

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Welcome to eMarketer

Dear Reader:

The February 2001 eCommerce: B2B Report provides a truly global perspective on the state of business-to-business e-commerce. With statistics and analysis covering every region of the world, the latest edition of eMarketer's B2B Report will help business decision makers obtain a feel for the size and potential of internet commerce wherever their company may be.

A full section of the report goes into further detail about the predominant trends in B2B e-commerce, covering such topics as:

- How companies are budgeting and implementing their e-commerce strategies
- How businesses are already buying and selling online
- Which B2B exchanges are succeeding
- Estimates for the cost to establish an online catalog
- Industry by industry comparative estimates revealing the potential for e-commerce

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

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Methodology: The eMarketer Difference

eMarketer research is founded on a simple philosophy of aggregation:

The key to approaching quantitative truth – particularly when examining the internet marketplace – is to consider data from as many reputable sources as possible. No one has all the answers. But taken together, multiple sources, coupled with healthy doses of common sense and business intelligence, create a reasonably accurate picture.

eMarketer has no testing technique to protect, no research bias, and no consulting clients to please. The eMarketer research team begins each report by examining research studies, surveys, and reports from hundreds of published, publicly available sources; we then filter, organize, and synthesize the information into tables and graphs. Finally, we present the comparative source data along with our own analysis, estimates, and projections. As a result, each set of findings reflects the collected wisdom of numerous research firms and industry analysts. The benefits to our readers are threefold:

- Information is more objective and comprehensive than that provided by any other single research source
- Information is available in one place – easy to find, evaluate, and compare
- Information can be quickly accessed to make intelligent, well-informed business decisions

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Amid a sharp downturn for internet stocks and the widely reported collapse of many internet companies that once promised fast growth and easy profits, the prospects for the growth of internet commerce nonetheless remain positive.

At the beginning of 2001, several businesses are well under way with their internet strategies. But the vast majority has sat on the sidelines, waiting to see what business landscape emerges after the dot com shakeout.

Indeed, the coming year will be the true beginning of internet commerce, when significant numbers of companies begin to implement their e-commerce strategies, beginning in both North America and Europe.

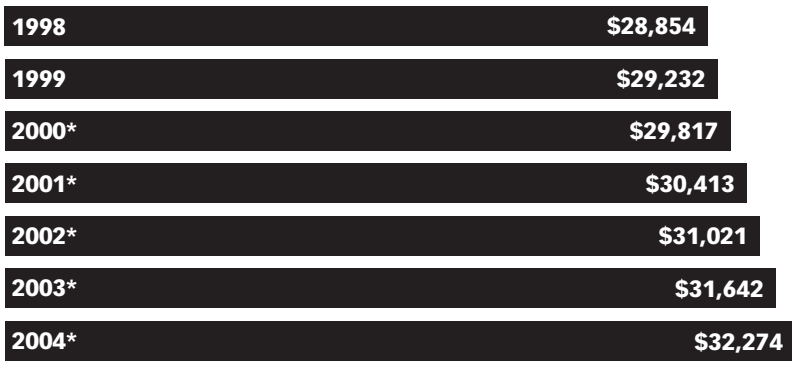
Internet-based B2B e-commerce will without question have a substantial impact on the way businesses interact, both with their customers and with their suppliers. Companies throughout the world will find considerable savings, as they automate their purchasing processes and begin to improve coordination in their supply chains.

In fact, the most significant impact of the so-called "B2B Revolution" may be its ability to push companies into rethinking their entire business processes.

Global B2B eCommerce Estimates

Global GDP figures are a useful benchmark for the size and potential growth of the world economy. Note, however, that most e-commerce projections are built on models that measure the total operating revenues or aggregate spending within a national economy.

World Bank: Real GDP 1998–2004 (in billions)



**eMarketer estimate, at 2% rate of real growth*
Source: World Bank, 2000; eMarketer, 2001

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Estimate of Worldwide Total B2B Economy, 1996 (in billions)

	B2B Economy	GDP	Ratio
US	$11,507	$7,636	1.51
Other High-Income Countries	$23,822	$15,808	1.51*
Upper-Middle-Income Countries	$3,024	$2,230	1.36*
Lower-Middle-Income Countries	$2,581	$2,141	1.21*
Low-Income Countries	$1,858	$1,761	1.05*
World Total	**$42,791**	**$29,576**	**1.45***

**Ratio is derived by applying an adjustment factor to the US ratio*
Source: Bear Stearns, 2000; International Telecommunications Union data

Applying an average nominal growth rate of 5%, Bear Stearns estimates that the worldwide B2B economy will reach $60 trillion by 2003. This compares to the Gartner Group's estimate of $105 trillion in 2004.

Forrester Research uses a multiplier ratio of 2.0 to arrive at its figures for aggregate spending in global and regional economies. By 2004, Forrester predicts that total worldwide sales will reach $79.2 trillion.

GDP and Aggregate Business Sales by Region, 2004 (in billions)

	GDP 2004	Total Sales in 2004
North America	$13,457.9	$26,915.9
Asia/Pacific Rim	$10,350.3	$20,700.5
Western Europe	$12,694.3	$25,388.6
Latin America	$1,681.3	$3,362.6
Africa/Middle East	$685.0	$1,370.1
Eastern Europe	$744.8	$1,489.7
Total	**$39,613.6**	**$79,227.4**

Source: Forrester Research, 2000

The foundation of eMarketer's global e-commerce model, as for most leading internet research firms, lies within the United States. As the early adopter of B2B e-commerce, the American economy acts as a leading indicator of how e-commerce will arrive in other countries. Industry by industry economic data is most robust for the United States, as is survey data covering the rate of adoption of internet-based technologies by American companies.

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B2B eCommerce by Region, 2000–2004 (in billions)

	2000	2001	2002	2003	2004	As a % of Worldwide B2B eCommerce 2004
North America	$159.2	$316.8	$563.9	$964.3	$1,600.8	57.7%
Asia/Pacific Rim	$36.2	$68.6	$121.2	$199.3	$300.6	10.8%
Europe	$26.2	$52.4	$132.7	$334.1	$797.3	28.7%
Latin America	$2.9	$7.9	$17.4	$33.6	$58.4	2.1%
Africa/Middle East	$1.7	$3.2	$5.9	$10.6	$17.7	0.6%
Total	**$226.2**	**$448.9**	**$841.1**	**$1,541.9**	**$2,774.8**	**100.0%**

Source: eMarketer, 2001

The relatively conservative estimates for the growth of B2B e-commerce released by eMarketer in December of 1999 are being revised slightly upward in 2001. This is primarily due to the shift in e-commerce leadership that has moved from the dot-coms to traditional brick and mortar firms. Beginning in February 2000, Global 1000 firms have become the primary drivers of internet-based commercial activity.

Forrester Research uses an S-curve to project the extent of e-commerce adoption. Typically, widespread adoption of a new technology is said to begin when more than 10% of companies in an industry have begun to implement it. Forrester marks this point as the beginning of "hypergrowth," which concludes at an industry saturation point with 90% of companies having adopted e-commerce capabilities.

Extrapolating this out to a regional and national level, Forrester Research has predicted that North American hypergrowth has already begun in 2000, to be followed closely by Western Europe in 2001.

Expected Beginning of Widespread eCommerce Adoption by Region

	Hypergrowth Year
North America	2000
Asia/Pacific Rim	2003
Western Europe	2001
Latin America	2004
Africa/Middle East	2005
Eastern Europe	2005

Source: Forrester Research, 2000

As a share of worldwide aggregate B2B sales, Forrester predicts that $6.33 trillion, or 7.99% of total B2B, will be traded online. This compares to the Gartner Group's $7.29 trillion projection, accounting for 6.94% of aggregate global B2B trade.

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B2B eCommerce by Region, 2000–2004 (in billions)

	2000	2001	2002	2003	2004	As a % of Worldwide B2B eCommerce
North America	$468.8	$841.1	$1,387.7	$2,183.9	$3,252.3	51.3%
Asia/Pacific Rim	$49.9	$108.9	$266.3	$672.8	$1,532.7	24.2%
Western Europe	$78.8	$175.6	$382.0	$778.4	$1,410.7	22.3%
Latin America	$3.3	$6.3	$12.7	$29.5	$76.0	1.2%
Africa/Middle East	$2.0	$4.2	$9.6	$23.0	$48.8	0.8%
Eastern Europe	$0.9	$1.6	$3.0	$6.2	$14.9	0.2%
Total	**$603.7**	**$1,137.7**	**$2,061.3**	**$3,693.8**	**$6,335.4**	**100.0%**

Source: Forrester Research, 2000

The worldwide B2B e-commerce forecast by IDC is one of the most conservative among major internet research firms. IDC's projection for global B2B e-commerce is for $2.2 trillion by 2004, with the United States accounting for 38% of that total.

B2B eCommerce Forecast by Region, 2000 & 2004 (in billions)

	2000	As a % of World Total	2004	As a % of World Total
US	$100.8	47%	$837.4	38%
Western Europe	$61.4	29%	$784.6	35%
Asia/Pacific Rim	$5.4	3%	$104.9	5%
Japan	$27.5	13%	$361.8	16%
Rest of World	$17.7	8%	$144.4	6%
Worldwide Total	**$212.8**	–	**$2,233.1**	–

Source: International Data Corp. (IDC), 2000

By comparison, Goldman Sachs has estimated that worldwide B2B e-commerce will reach $4.5 trillion by 2005. By 2020, the investment bank predicts that as much as 80% of worldwide B2B e-commerce will be conducted online.

In recent months, much has been made of the variance between worldwide B2B e-commerce projections by internet research firms. The estimates range from between $1 trillion and $10 trillion for worldwide B2B e-commerce within the next four years, leaving many observers to ask which one may be considered to be correct.

By taking a look at the collective data and forecasts of several research firms, users of this information will be better equipped to make their own assessments for the size of internet commerce. But it is important to bear in mind that e-commerce forecasts best provide users with an indication of where major trends are leading; they are after all, estimates.

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Comparative Estimates: Worldwide B2B eCommerce, 2000–2004 (in billions)

	2000	2001	2002	2003	2004
eMarketer	**$226**	**$449**	**$841**	**$1,542**	**$2,775**
AMR Research	–	–	–	–	$5,700
Computer Economics	$3,068	$5,232	$6,815	$9,907	–
Forrester Research	$604	$1,138	$2,061	$3,694	$6,335
IDC Research	$213	–	–	–	$2,233
Gartner Group	$403	$953	$2,180	$3,950	$7,290
Morgan Stanley Dean Witter	$200	$721	$1,378	–	–
Goldman Sachs & Co.	$357	$740	$1,304	$2,088	$3,201
Ovum	$218	$345	$543	$858	$1,400

Source: eMarketer, 2001; various, as noted

Many internet analysts have tended to use optimistic growth projections to arrive at their current e-commerce projections. Basing their models on data for the US economy, the most recent US government data is from the 1997 economic census. Researchers have used this data as the foundation of their models, building out growth estimates that go as far forward as 2005.

There are two primary factors that will affect the accuracy of e-commerce projections over the coming years. The first is the rate of growth of the global economy. The second is the rate at which businesses are able to adopt and implement e-commerce technology. Both of these elements will impact e-commerce projections, and it is fair to expect that internet research firms will revise their e-commerce forecasts as time goes on.

Without question, the initial survey data projecting the rate at which firms will adopt new e-commerce technologies has been optimistic. In many cases, leading companies may have overstated the degree to which their companies will be internet-ready in the short term. As the realization of the complexity of new e-commerce technologies has led forecasters to push back the live dates of the leading consortia-led B2B exchanges, so too will the most optimistic B2B e-commerce projections potentially need to be scaled back.

eMarketer expects that some internet research firms may begin revising their estimates during the early months of 2001. The United States Commerce Department is scheduled to release its first B2B e-commerce numbers in the first quarter of 2001, which will provide internet observers with the most comprehensive look at e-commerce activity within selected industries.

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Because of the dynamic nature of economic growth, it will be necessary for estimates to be adjusted over the long term, especially if the rate of growth slows in the global or US economies.

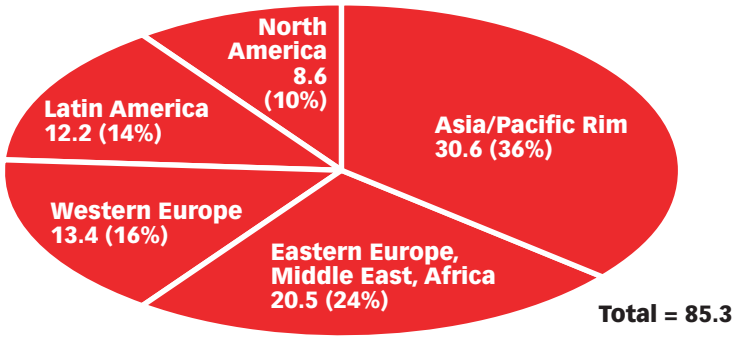
Most forecast models have been built upon the evaluation of e-commerce adoption among American industries, and it is in this context that the leading B2B e-commerce projections may be best compared. The discussion of industry-by- industry e-commerce adoption will therefore be set aside for the North American chapter as well, primarily because global industry data, especially as it relates to e-commerce adoption, is difficult to come by.

Number of Businesses Worldwide

Counting the number of businesses worldwide is a challenging task. With reliable data available only from leading industrial economies, most analysts have to rely on estimates to devise broad regional figures. Probably the most widely known is Dun and Bradstreet's, which places the number of businesses worldwide at 53 million.

More recent research from AMI-Partners places the estimate at 85.2 million small and medium-sized businesses worldwide, with the Asia Pacific region owning the greatest share.

Number of Small/Medium-Sized Businesses by Region, 2000 (in millions)



Source: AMI-Partners, 2000

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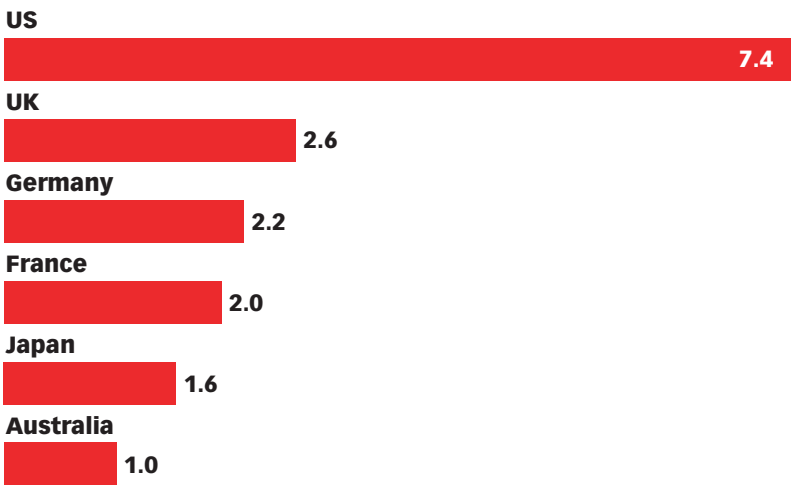
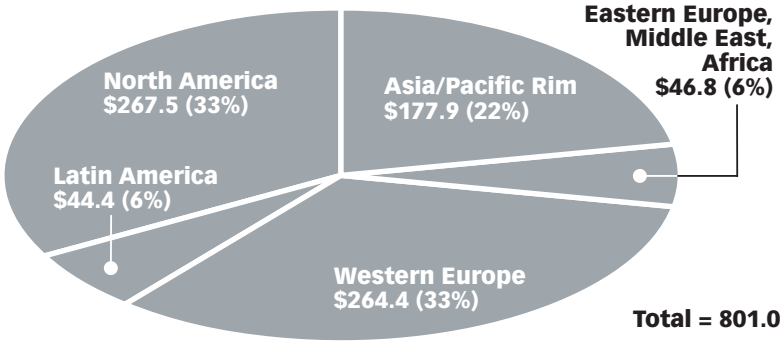
Number of Small/Medium-Sized Businesses by Country, 2000 (in millions)



Source: AMI-Partners, 2000

In gauging technology spending by small and medium-sized businesses, AMI-Partners has surveyed businesses in the leading national economies of each global region. Building its worldwide forecast from these numbers, AMI-Partners estimates that small and medium-sized businesses spent $801 billion on IT- and internet-related technologies in 1999. This spending was expected to grow to $877.3 billion in 2000 and $962 billion in 2001.

Small/Medium-Sized Business Spending on IT, Internet, and Telecommunications by Region, 1999 (in billions)



Source: AMI-Partners, 2000

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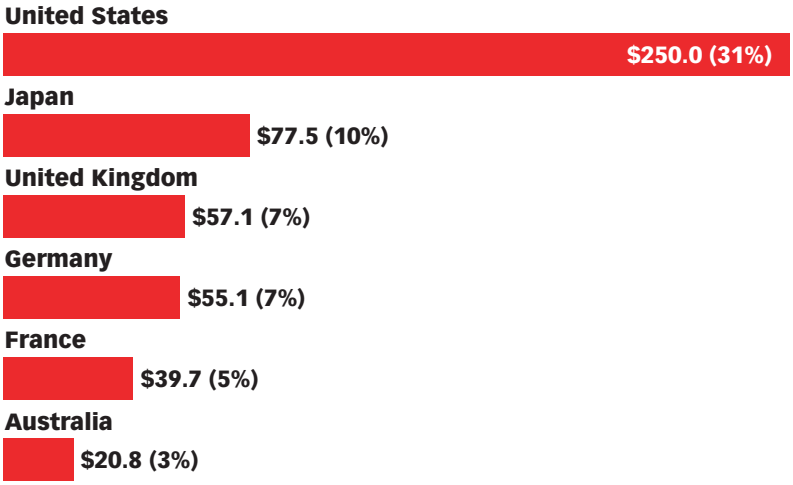
Small/Medium-Sized Business Spending on IT, Internet, and Telecommunications by Country 1999 (in billions)



Source: AMI-Partners, 2000

B2B eCommerce and Global Trade

One of the myths of B2B e-commerce is that the establishment of a presence on the world wide web suddenly transforms a company into a global business. As an analyst from the Gartner Group succinctly observed, "there is a fallacious assumption that internet commerce leads to 'open' commerce between unknown parties."

As evidence of this assumption, IDC found that during the year 2000, 60% of firms were expanding their internet-presence into other countries, compared to 37% in 1999.

While companies have found that their websites do serve as successful "brochure-ware," attracting new business from overseas, the reality is that selling into foreign markets is a complicated process, not yet entirely facilitated by the internet.

Working out product specifications, arranging shipping logistics and insurance, as well as establishing payment terms are all part of any new business relationship. With foreign trade, the complexity of a transaction is aggravated by distance and language barriers, not to mention government regulatory and customs issues.

To the extent that e-commerce will open up communications and producers' awareness of foreign markets, internet-based e-commerce will contribute to the growth of global trade. But international trade will primarily expand thanks to national efforts at trade liberalization through such bodies as the WTO or through regional trading blocks, and through company-initiated export programs.

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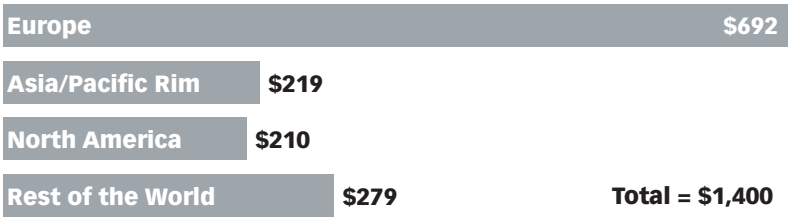
Although international trade will indeed be made easier by web-enabled technologies, the primary benefits of e-commerce technology will be used by those companies that are able to apply them to established trade patterns.

At present, internet-based technologies are being applied to ease the complexity of overseas transactions. For example, there are already several internet companies that facilitate trade by streamlining international payments or customs paperwork. Over the short term, these advances will be of primary benefit to companies that are currently trading with foreign markets.

The predictions by Forrester Research follow these established patterns of international trade. In total, Forrester estimates that 18% of global exports will trade online by 2004, with Canada as the leader of online exporters.

US-based marketplaces expect 44% of their trading volume to come from abroad by 2002 according to Forrester's survey, with 90% of these US-based exchanges expecting to support participants in Asia, Europe, and Latin American by that time. Total cross-border B2B e-commerce is expected to reach $1.4 trillion by 2004.

Online Exports by Region, 2004 (in billions)



Source: Forrester Research, 2000

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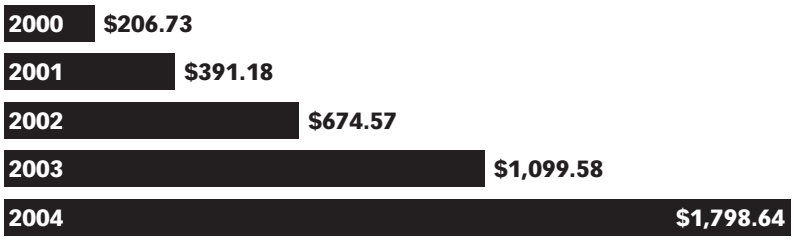
A. Introduction

eMarketer has adopted internet-industry convention by grouping both Canada and the United States as part of the North American market, and including Mexico as part of Latin America.

This classification is in large part due to the linguistic differences between these two separate markets – a separation that is particularly relevant to the consumer side of e-commerce activity. While separate consideration may also be given to French-speaking Quebec and the substantial Spanish-speaking population within the United States, for the purposes of the coverage of business-to-business activity, these communities are included within the Canadian and American economies.

For the sake of consistency, all dollar-figure projections for e-commerce activity are in US dollars, unless otherwise specified.

North American eCommerce Revenues, 2000–2004 (in billions)

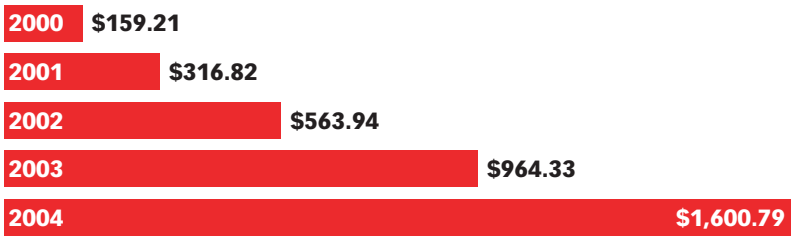


Source: eMarketer, 2001

North America leads the world as an early adopter of e-commerce activity. Accounting for 72.3% of global e-commerce in 2000, this lead is expected to decline over the coming years to 56.1% of global e-commerce in 2004, as other regions of the world — in particular Europe and Asia — are steadily catching up.

Turning the focus to business-to-business (B2B) e-commerce, comparative estimates for the potential size of North American activity range from $1.6 trillion to $3.2 trillion by 2004. In all three of the following estimates, only Canada and the United States have been included within the North American market.

North American B2B eCommerce Revenues, 2000–2004 (in billions)



Source: eMarketer, 2001

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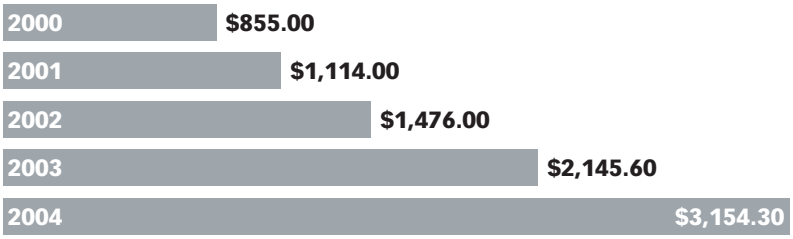
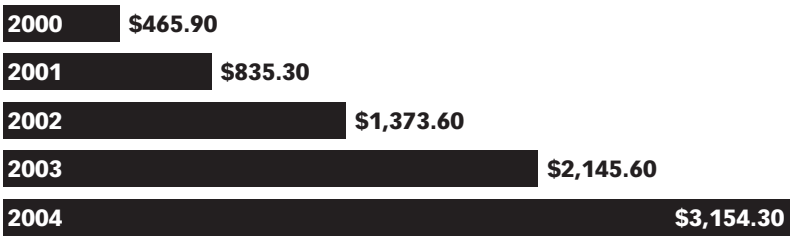
North American B2B eCommerce Revenues, 2000–2004 (in billions)



Source: Datamonitor, 2001

North American B2B eCommerce Revenues, 2000–2004 (in billions)



Source: Forrester Research, 2001

Additionally, Gartner Group predicts that B2B revenues will stand at $2,840.0 billion in 2004. North American B2B e-commerce was at $500 million in 1999, according to Gartner, growing at a rate of 171% from a mere $183 million in 1998.

In one of the most comprehensive looks at internet-based B2B activity, Forrester Research has broken down both Canadian and American e-commerce activity by top-level industry. Using updated North American Industry Classification Series (NAICS) definitions and the most current economic census data, the Boston-based internet research firm has built out an e-commerce model with economic projections going forward to 2004.

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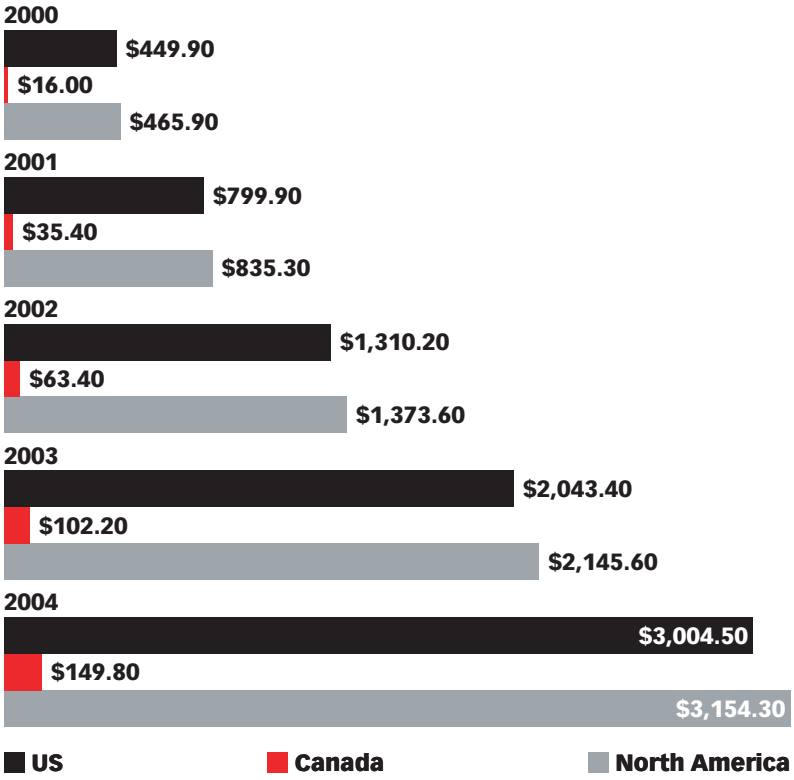
North American B2B eCommerce, 2000–2004 (in US billions)



Source: Forrester Research, 2000

B. The United States

Although the internet was originally designed to primarily serve as a means of communication, it should come as no surprise that the entrepreneurial spirit of America found a way to bring commerce to the world wide web. Since the early 1990's when consumer e-commerce began to take off, the United States has been pushing the frontiers of commercial activity on the internet. In 2001, the numbers continue to show that America is still driving the internet economy.

GDP figures are the net figures of value-added transactions, including the trade balance of import and export flows within the national economy. The US Congressional Budget Office projects real growth to range from 3.9% to 2.6% over the next four years.

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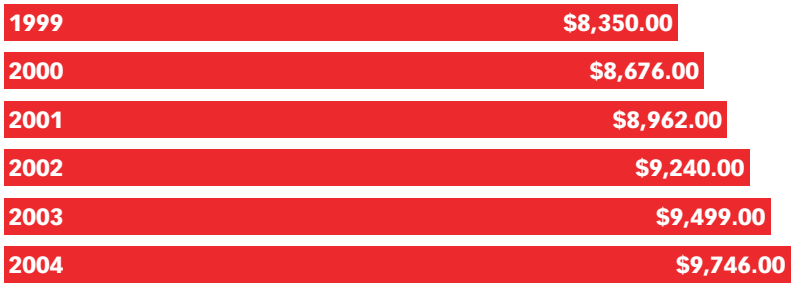
US GDP, 1999–2004 (in billions)



Notes: GDP in 1999 prices
Source: World Bank, US Congressional Budget Office growth rates, 2000

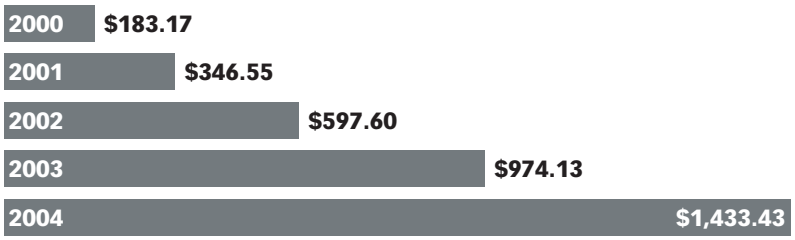
Looking back at US economic census data from 1996, it is possible to see the aggregated breakdown of B2B e-commerce in the US economy. Bear Stearns estimates that in 2000, the aggregate spending in the US economy was approximately $14.0 trillion, and that it will reach roughly $16.2 trillion by 2003.

Total US B2B Economy, 1996 (in billions)

	Value	Breakdown (%)	Breakdown Ex–Traded Goods (%)
Goods	$3,334	29%	42%
Traded Goods	$3,601	31%	N/A
Services and Software (Excluding Intermediation)	$4,013	35%	51%
Intermediation Services	$560	5%	7%
Total Purchases	**$11,507**	**100%**	**100%**

Based upon US BEA and Bureau of the Census data, 1997
Source: Bear Stearns, 2000

US eCommerce Revenues, 2000–2004 (in billions)



Source: eMarketer, 2001

US e-commerce revenues are expected to reach $974 billion in 2003, up from the previous estimate of $805 billion. eMarketer has extended its model out to 2004 as well, with e-commerce activity projected to reach more than $1.4 trillion by 2004.

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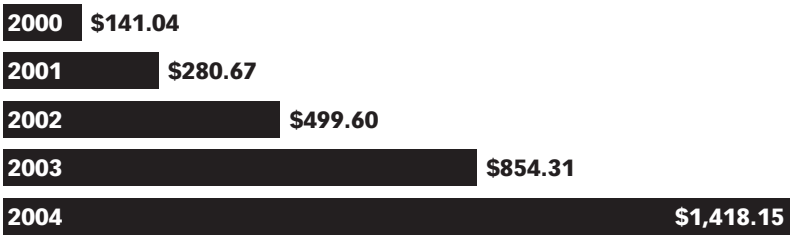
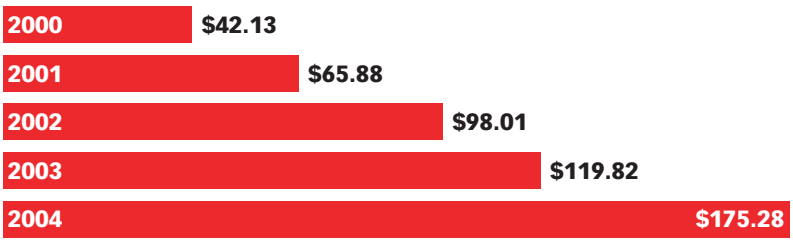
US B2B eCommerce Revenues, 2000–2004 (in billions)



Source: eMarketer, 2001

US B2C eCommerce Revenues, 2000–2004 (in billions)

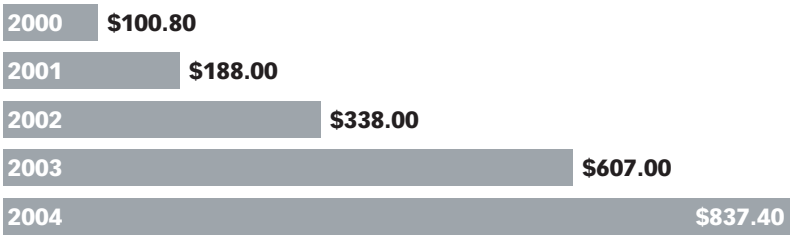


Source: eMarketer, 2001

Just as businesses have been quicker to adopt B2B e-commerce solutions than when eMarketer last updated its model in December of 1999, so too has the online business-to-consumer trade seen an increase in value. Despite the decline of many dot-com B2C firms, brick and mortar companies have arrived online in 2000, raising estimates from $37 billion to $42 billion for last year.

Comparative Estimates

US B2B eCommerce, 2000–2004 (in billions)



Source: International Data Corp. (IDC), 2001

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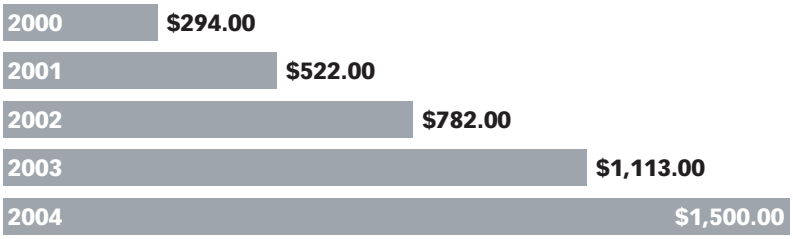
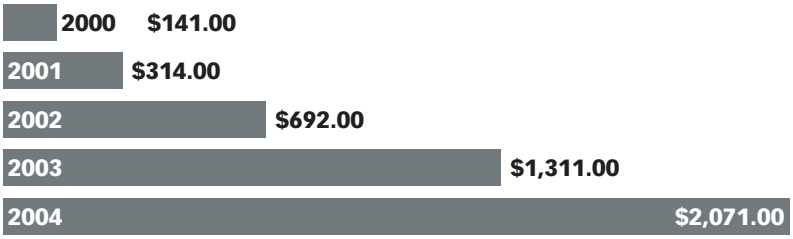
US B2B eCommerce, 2000–2004 (in billions)



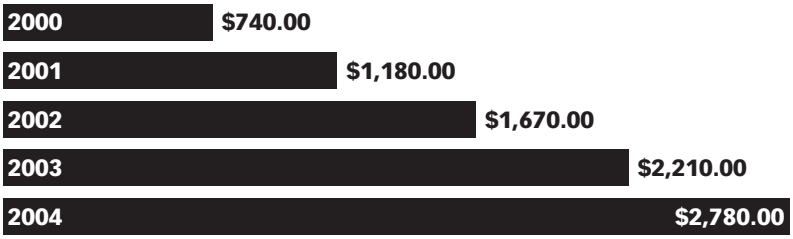
Source: Goldman Sachs, 2000

US B2B eCommerce, 2000–2004 (in billions)



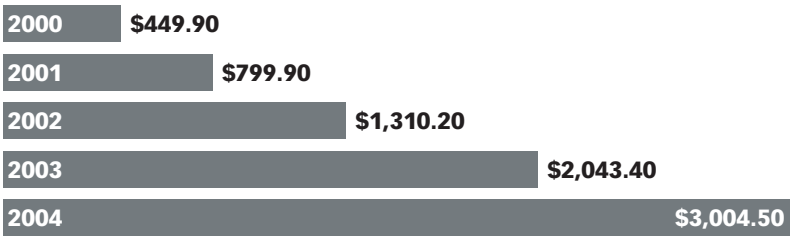
Source: Keenan Vision, 2000

US B2B eCommerce, 2000–2004 (in billions)



Source: Yankee Group, 2000

US B2B eCommerce, 2000–2004 (in billions)



Source: Forrester Research, 2000

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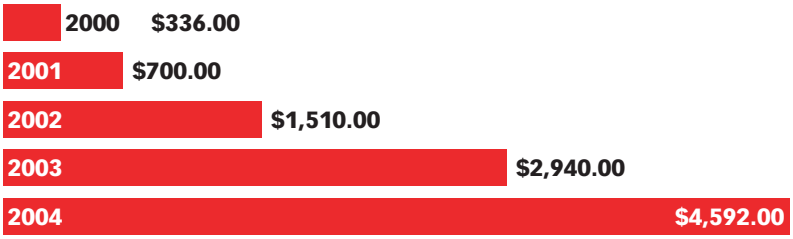
US B2B eCommerce, 2000–2004 (in billions)



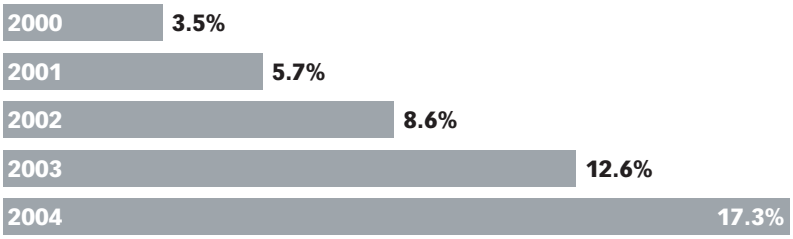
Source: Jupiter Research, 2001

In addition, Boston Consulting Group projects $2 trillion (not counting EDI) in e-commerce revenues by 2003 and AMR Research predicts $5.7 trillion in 2005.

Updating the comparative estimates from eMarketer's previous B2B Report, Jupiter Communications has added its analysis to the mix of B2B forecasts. As one of the few firms projecting as far forward as 2005, Jupiter projects that US B2B e-commerce will reach $6.3 trillion by then.

As opposed to comparing dollar-value estimates of the potential size of e-commerce activity, eMarketer has found that it is more relevant to compare the percentage estimates of online B2B e-commerce, as a portion of total offline commercial activity.

US Online B2B eCommerce, 2000–2004 (as a % of total B2B trade)



Source: Forrester Research, 2000

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The estimates from Forrester Research show that only 3.5% of total economic activity was conducted online in 2000, with 17.3% of all e-commerce being conducted online by 2004. Jupiter Communications sees online B2B e-commerce growing from 3% of total trade in 2000 to 42% of total trade by 2005.

B2B Trade by Industry

As discussed previously, erroneous comparisons are frequently made between GDP and aggregated or total operating revenues.

This apples-to-oranges comparison has caused some confusion among internet observers, particularly those who have been trying to forecast potential B2B marketplace revenues within a specific industry. Some forecasters have used aggregated industry revenues to build their estimates, while others have relied on more conservative industry GDP figures. This has resulted in considerable differences among industry revenue estimates, with e-commerce forecasts for individual industries varying by more than $100 billion.

Almost all leading internet research firms including eMarketer, Forrester Research, and the Gartner Group, have built their e-commerce forecasts based on aggregate industry spending. As a result, an individual company's value-add to each transaction is not netted out in the total e-commerce revenue projection for an industry.

As a benchmark for comparing the size of economic sectors within the US economy, US Economic Census Data from 1997 provides a rough estimate for the relative size of each industry. This data is applicable going forward to 2004, because the size of a sector within the economy will remain for the most part constant over this period of time.

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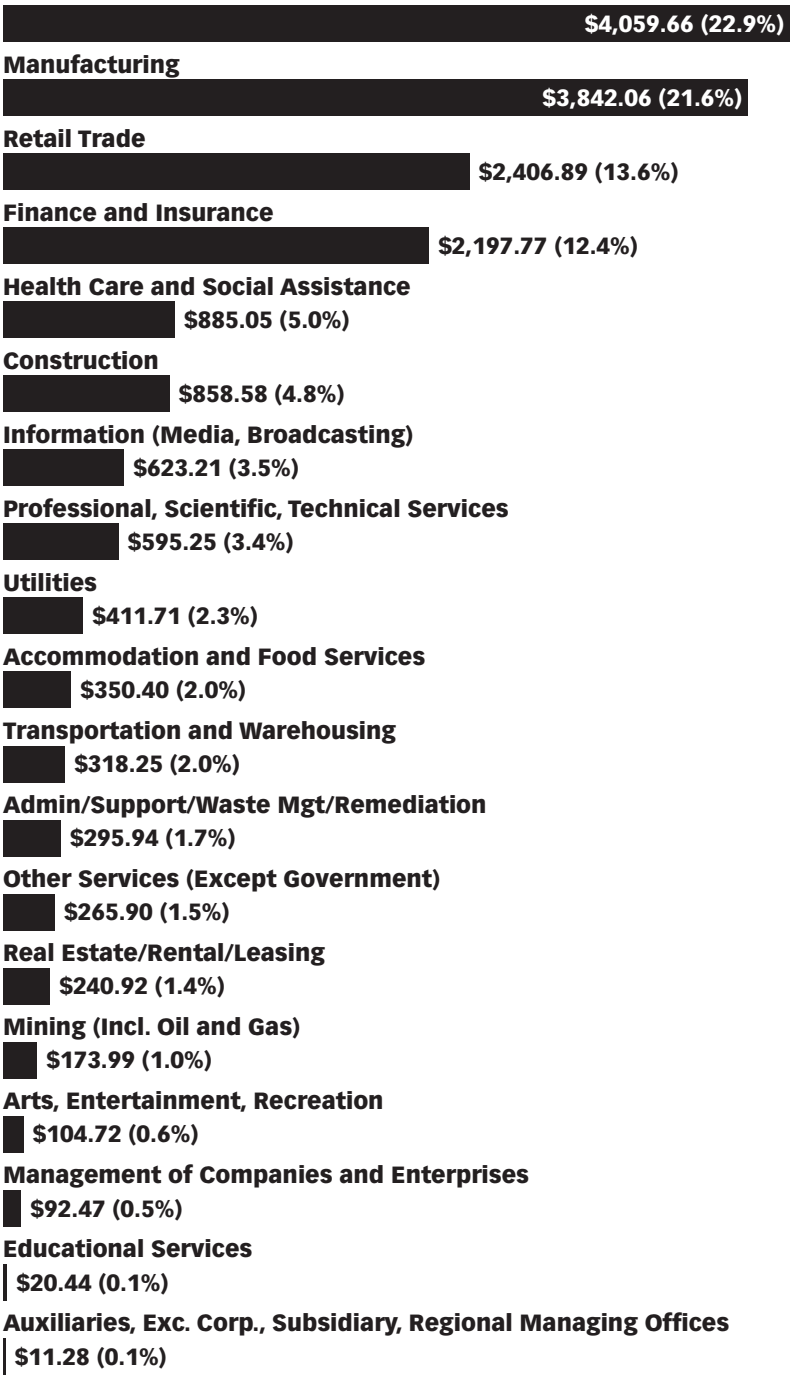
Leading US Economic Sectors (in billions and as a % of total sales), 1997



Notes: Prices are in 1997 dollars
Source: US Bureau of Economic Analysis, October 2000

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It is important to point out that for the purposes of forecasting internet transactions, wholesale trade and manufacturing are usually broken down and redistributed among the sub-category industry classifications. For example, sales in the manufacturing sector that are attributable to the aerospace industry are included back within the aerospace industry.

However, this redistribution often contributes to the discrepancies among internet research firms. Because of varying industry definitions used by internet analysts, not all models redistribute wholesale and manufacturing to the appropriate industry segments, while others do not do so in the right proportions.

Further discrepancies will arise in projected industry e-commerce revenues because different industry growth rates are used to forecast revenues that are based upon 1997 figures out to the year 2005. Differences in growth rates can vastly affect the dollar values of total e-commerce projections.

As a result of the variance in dollar-value estimates for B2B e-commerce within individual industries, comparative analysis of e-commerce penetration rates may be a more helpful means of gauging the potential for e-commerce activity. From this reference point, individual companies can build their own expectation of the degree to which their firm will be conducting e-commerce.

In order for individual companies or industry observers to form their own opinions of the degree to which internet commerce will penetrate their business, eMarketer has assembled the following industry briefs. These statistics provide a comparative look at the degree of electronic commerce penetration within individual industries.

While some of the data that has been included is from the 1997 US Economic Census, the selected numbers are those that are applicable to long-term buying trends in each industry. Other figures that relate to infrastructure are also relevant to long-term forecasting because they provide an indication of the capital investments in inter-business trade that will continue over the next five years. They may also be considered to be an indication of the foundation upon which internet e-commerce will be built.

Concerning the data from *InformationWeek*, these numbers are from surveys conducted with e-commerce technology leaders within specific industries, providing an indication of what lies ahead for the majority of their industry counterparts. The numbers from Bear Stearns breaking down indirect and direct spending by industry players are highly relevant to e-commerce, since indirect procurement items have emerged as the primary category of internet-traded products. Direct procurement items are more likely to be moved online over the longer term, as companies invest in supply chain management applications.

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eMarketer has also assembled a brief list of emerging leaders among business-to-business exchanges within each industry. Leading consortia exchanges are mentioned, as are third-party and private exchanges that Forbes magazine has identified as being among the best online.

Industry Brief: Aerospace and Defense

The $400 billion US aerospace industry includes production of both commercial and military aircraft and parts. By some estimates, the spare parts market is worth $30 billion alone. Driven in part by the US military's demands for greater supply chain efficiency, leading military aircraft manufacturers Boeing, Lockheed Martin, Raytheon, and BAE Systems have combined forces to create Exostar, a worldwide consortium exchange for the trade of non-restricted aircraft parts and equipment.

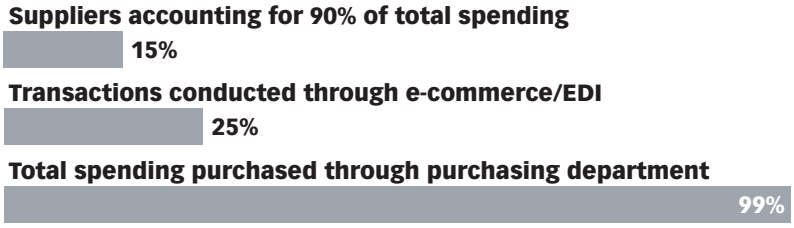
Rival consortium exchange MyAircraft.com is sponsored by aerospace industry parts suppliers Honeywell (now owned by GE) and United Technologies.

Comparative Estimates: % of Internet–Based B2B Revenues for the US Aerospace Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Aerospace	8.0%	35.0%
Forrester Research	Aerospace and defense	4.8%	15.4%

Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Aerospace and Defense Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

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Leading B2B Exchanges for the Aerospace and Defense Industry
Consortia Exchanges
Exostar
MyAircraft
Other Exchanges
Avolo
GE Aircraft Engines
Inventory Locator Service
PartsBase.com
TradeAir.com
Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Agriculture

The US agriculture industry has revenues of more than $825 billion per year, with Forbes magazine estimating that as many as 50% of farmers have internet access. By comparison, online seed products vendor DirectAg.com has said that as many as 85% of farmers between the ages of 25 and 45 have access to the web. Agriculture industry exchanges have therefore been fast to gain membership, as farmers have quickly understood the gains to be had through aggregated purchasing. As early as the first quarter of 2000, Farmbid.com had 90,000 members, while XSAG.com served 50,000 farmers according to Business.com.

Consortium-led exchange Rooster.com is the 800-pound gorilla of the online agriculture sector, founded by Cargill, DuPont, and Cenex. However, several industry leaders within specific markets such as dairy, cattle or poultry have also formed consortia exchanges or built significant online markets around their private websites. Examples include eMerge Interactive for the livestock industry or Dairy.com which was started by Kraft Foods, Land O'Lakes, Dannon, and the Dairy Farmers of America.

Comparative Estimates: % of Internet-Based B2B Revenues for the US Agriculture Industry, 2000 & 2004			
	Industry Definition	**2000**	**2004**
Goldman Sachs	Agriculture	4.0%	12.0%
Forrester Research	Food and agriculture	1.4%	11.7%
Source: eMarketer, 2001; various, as noted.			

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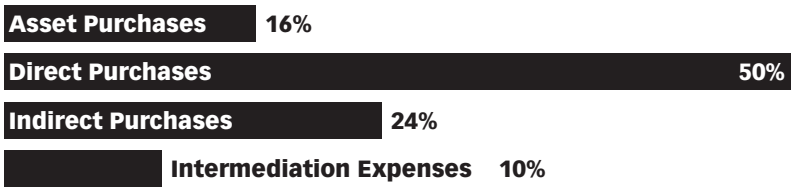
US Agriculture, Forestry and Fisheries Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

Leading B2B Exchanges for the Agriculture Industry

Consortia Exchanges
Rooster.com
Dairy.com
Other Exchanges
Cybercrop.com
DirectAg.com
eMerge
Farmbid.com
Farms.com
XSAG

Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Automotive

The US automotive industry kicked off the storm of consortia-exchange announcements when GM, Ford, and Daimler Chrysler announced that they would be combining their $250 billion in purchasing within one single exchange. Since its press release debut, Covisint has been joined by Nissan/Renault, while foreign automakers such as Toyota and Volkswagen have focused on building their own private exchanges. Further information about Covisint's transaction activity is cited in the section on consortia exchanges in Chapter 6.

Other online automotive players that lie outside the realm of Covisint include PartsNet.com, which serves the used autoparts industry and Autodaq which facilitates the online trade of used cars.

Comparative Estimates: % of Internet–Based B2B Revenues for the US Automotive Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Motor vehicles and parts	2.7%	17.5%
Forrester Research	Motor vehicles	3.0%	26.2%

Source: eMarketer, 2001; various, as noted

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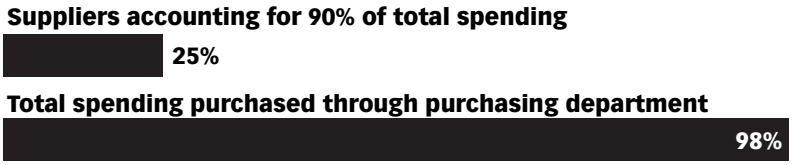
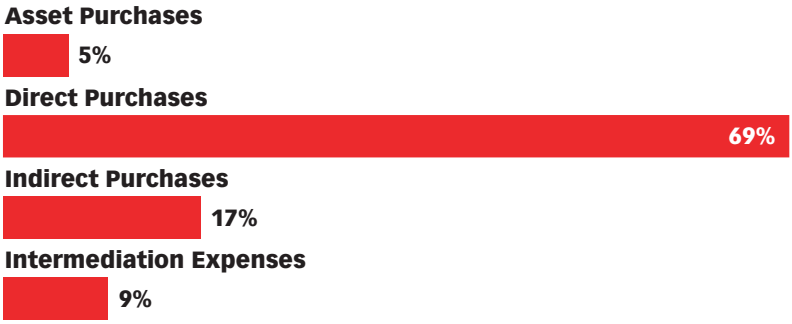
Purchasing Data for the US Automotive Sector, 1997



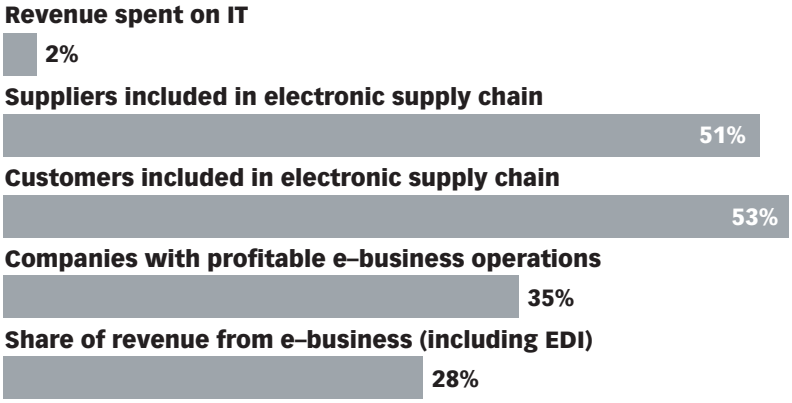
Source: Center for Advanced Purchasing Studies, 1997

US Automobiles, Trucks, and Related Parts Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders in the US Automotive Industry, 2000



Source: InformationWeek, 2000

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Leading B2B Exchanges for the Automotive Industry
Consortium Exchange
Covisint
Other Exchanges
Auto Trade Center
Autovia
Fleetworks.com
iSalvage.com
Partsnet
Truck.net
iStar Exchange
Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Chemicals

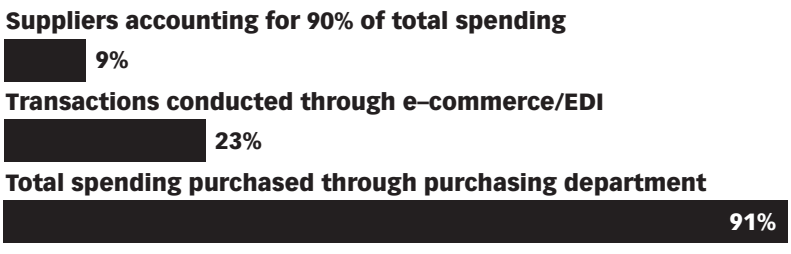
The chemicals industry is global in nature and is highly fragmented due to the numerous companies that sell products in hundreds of niche markets. It's no surprise that Forbes magazine counted as many as 56 business-to-business exchanges serving this industry. By most accounts, the leading online exchange is ChemConnect, which is supported by more than 50 industry heavyweights including Eastman Chemical, Dow Chemical, Roche, and Mitsubishi. Backed by DuPont, third-party exchange CheMatch.com trades bulk commodity chemicals, plastics, and petrochemicals.

Comparative Estimates: % of Internet–Based B2B Revenues for the US Chemicals Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Chemicals	5.0%	20.0%
Forrester Research	Petrochemicals	1.9%	16.9%

Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Chemicals Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

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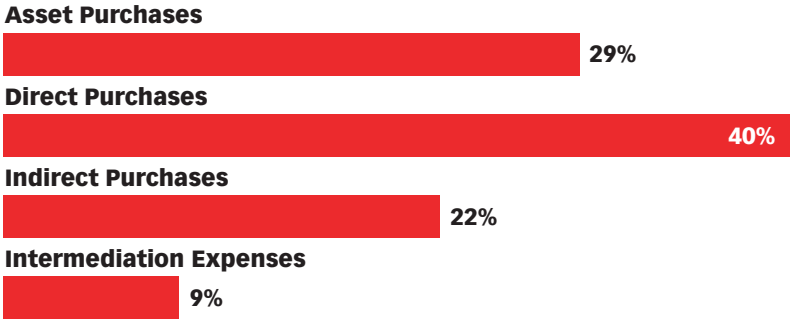
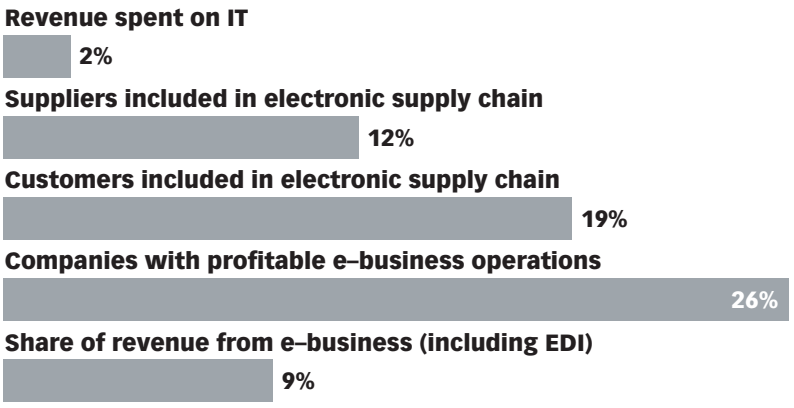
US Chemicals and Related Products Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders in the US Chemicals Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Chemicals Industry

Consortia Exchanges
Elastomers
Omnexus
Other Exchanges
CambridgeSoft.com
CheMatch.com
ChemConnect
Commerx
E–chemicals
GE Polymerland

Source: Forbes, 2000; eMarketer, 2001

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Industry Brief: Computers and Electronics

The computer and electronics industry is a natural leader in internet-based trade, as manufacturers and distributors already have several years' experience selling on the web. Four of the top five websites for internet-based revenues are operated by computer companies.

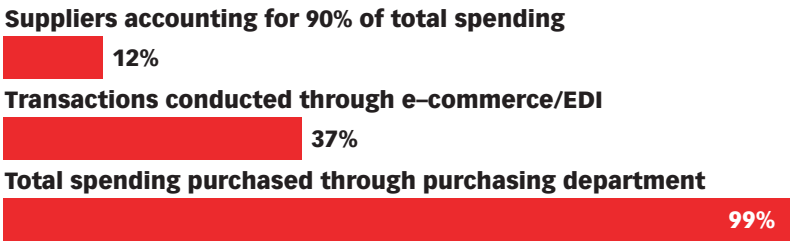
This independent success hasn't stopped the formation of consortia exchanges however, as fifteen original equipment manufacturers have formed Converge (formerly eHitex) to streamline their direct procurement activity. This consortium has recently purchased VerticalNet's NECX, a leading electronic components exchange. Another consortium exchange, e2open, is supported by eight companies in the computer, electronics, and communications industry and facilitates the spot market trade of electronic components and parts. Independent electronic parts exchange PartMiner has recently partnered with e2open.

Comparative Estimates: % of Internet–Based B2B Revenues for the US Computers and Electronics Industry, 2000 & 2004

	Industry Definition	2000	2004
KPMG	Electronics	8.5%	24.5%
Goldman Sachs	Comp. hardware, software, data net.	15%	35%
Forrester Research	Computing and electronics	28.0%	40.0%

Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Computer Equipment Sector, 1998



Source: Center for Advanced Purchasing Studies, 1998

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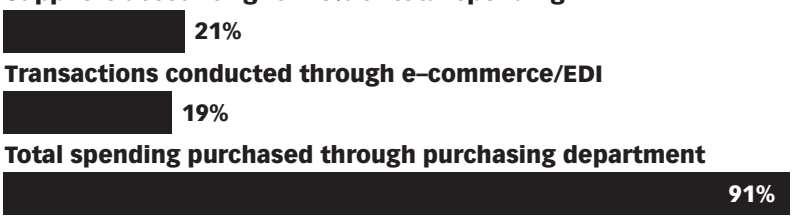
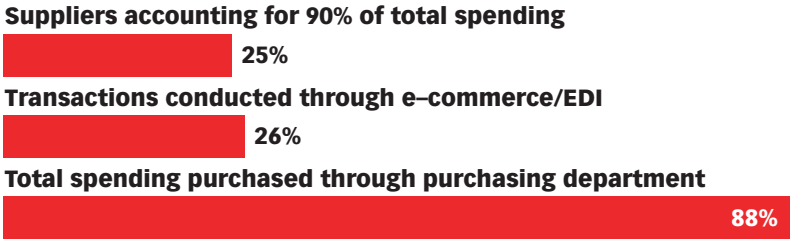
Purchasing Data for the US Electrical Equipment Sector, 1997



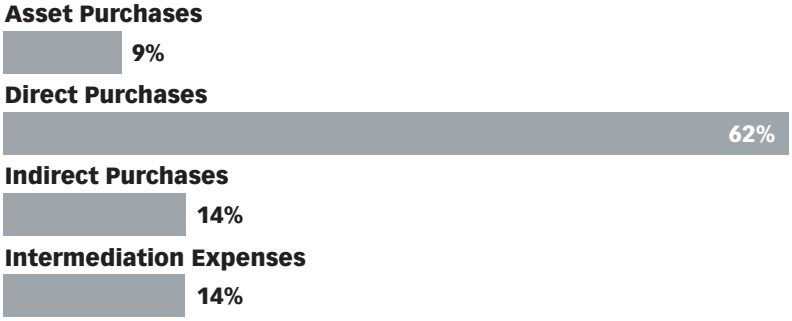
Source: Center for Advanced Purchasing Studies, 1998

Purchasing Data for the US Electronics Sector, 1996



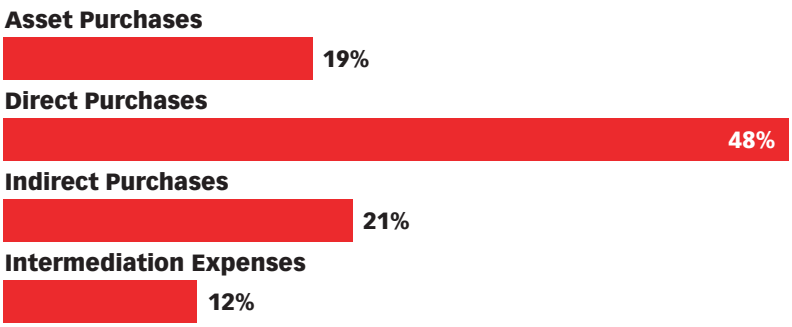
Source: Center for Advanced Purchasing Studies, 1996

US Computers and Related Products Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

US Electrical Equipment Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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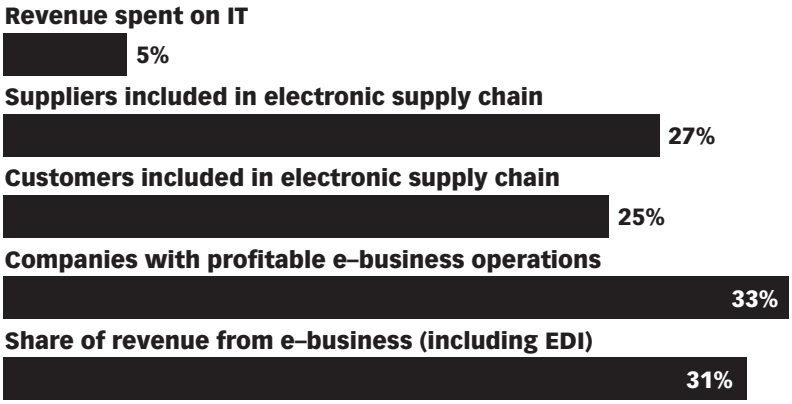
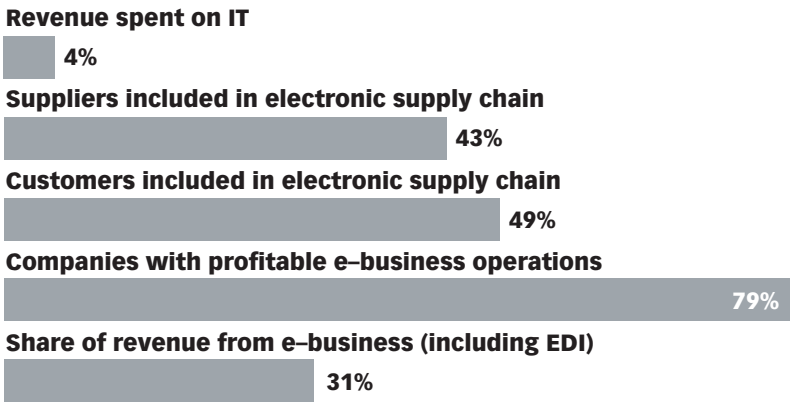
IT Spending and eBusiness Revenues among Technology Leaders in the US Electronics Industry, 2000



Source: InformationWeek, 2000

IT Spending and eBusiness Revenues among Technology Leaders in the US Information Technology Industry, 2000



Source: InformationWeek, 2000

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Consortia Exchanges
e2open
Converge (eHitex)
Other Exchanges
3Re.com
Avnet
ChipCenter
FastParts.com
Hyporium
Isuppli
Partminer
PCOrder
QuestLink Technology
USBid
Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Construction and Real Estate

In mid-2000, the *Engineering News Record* found that only 5.6% of construction companies were buying construction materials online, while 67.7% of these firms were not using the internet for e-commerce of any kind. However, the greatest benefit that most construction companies expect from the internet is not for transactions, but through improvements in communication: The coordination of people and materials is crucial to construction and engineering work. This is the primary driver behind Citadon, the project management exchange that was formed following the merger of two independent exchanges Bidcom and Cephren.

As for the real estate industry, both commercial and residential e-commerce activity has up until mid-2000 centered around brochureware, as companies have used the internet to showcase rentals and properties for sale. But several exchanges are now coming online that help to streamline the paperwork, title search and financing activity associated with real estate deals.

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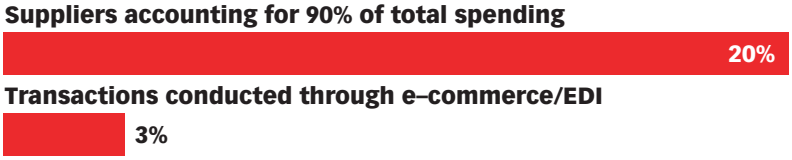
Comparative Estimates: % of Internet–Based B2B Revenues for the US Construction and Real Estate Industry, 2000 & 2004

	Industry Definition	2000	2004
Forrester Research	Construction	0.5%	10.1%
Goldman Sachs	Construction and real estate	15.0%	35.0%
AMR Research	Finance, insurance, real estate	–	35.0%

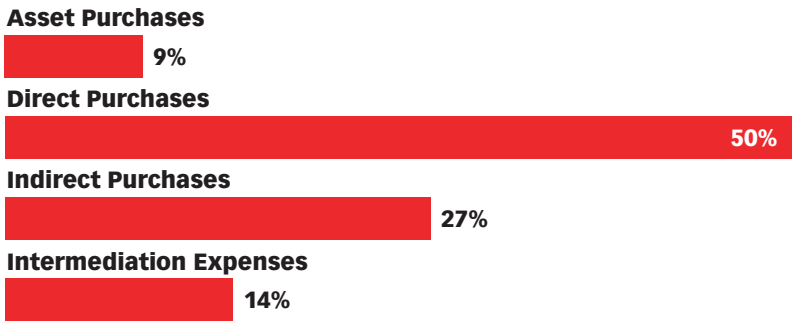
Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Engineering and Construction Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

US Construction Services and Building Materials Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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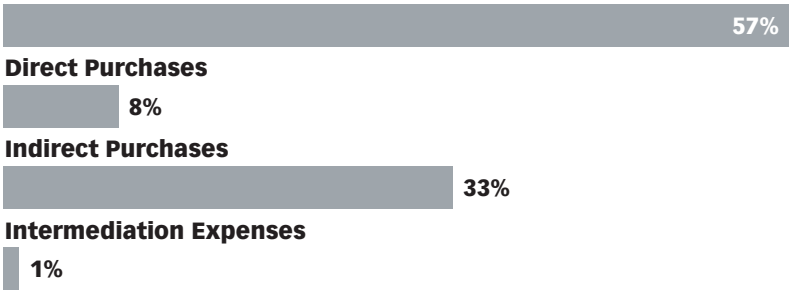
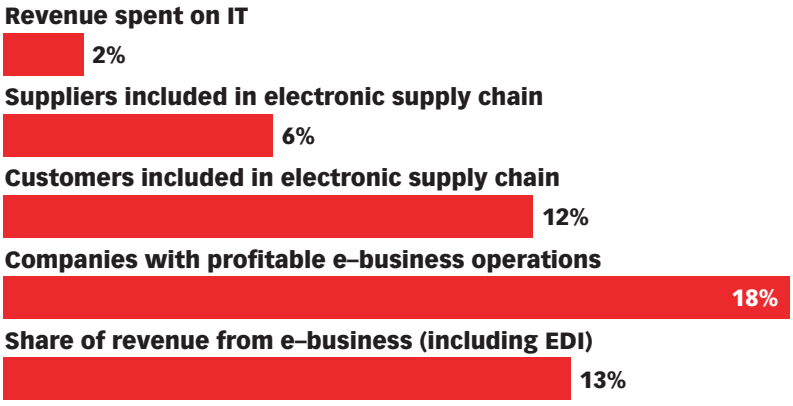
US Real Estate Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders



Source: InformationWeek, 2000

Leading B2B Exchanges for the Construction and Building Industry

Consortium Exchange
HomebuildersXchange
Other Exchanges
Citadon
Bliquid
BuildNet
Buildscape.com
Buzzsaw.com
C–Z.com
Construction.com
E–Builder.com
Point2

Source: Forbes, 2000; eMarketer, 2001

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Leading B2B Exchanges for the Real Estate Industry
Consortium Exchange
Project Constellation
Other Exchanges
CapitalThinking
Comro.com
CoStar Group
Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Consumer Goods

The back-end of retail often involves an extensive network of manufacturers, distributors, and retailers that move expensive inventories of finished goods among one another. Supply chain management and the benefits of internet-based procurement offer the potential for substantial savings for retail firms. WalMart's private exchange RetailLink is often cited as a leader in carving out these supply chain efficiencies.

Consortia players have built rival models the World Wide Retail Exchange and the GlobalNetXchange as a means of cooperatively reducing costs. Comparative profiles of these exchanges are located in the section on exchanges in Chapter 6. By contrast, WalMart has decided to remain independent, with the belief that it can best manage its supply chain on its own.

Comparative Estimates: % of Internet–Based B2B Revenues for the US Consumer Products Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Consumer products/intrabusiness	0.4%	1.1%
Forrester Research	Consumer goods	1.2%	13.1%
AMR Research	Wholesale trade	–	35.0%

Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Personal Care Products Sector, 1997

Suppliers accounting for 90% of total spending

Total spending purchased by purchasing department

Source: Center for Advanced Purchasing Studies, 1997

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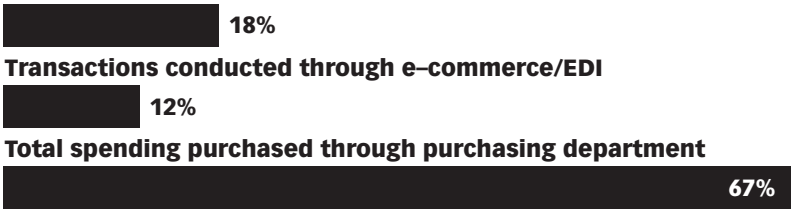
Purchasing Data for the US Textiles/Apparel Sector, 1999

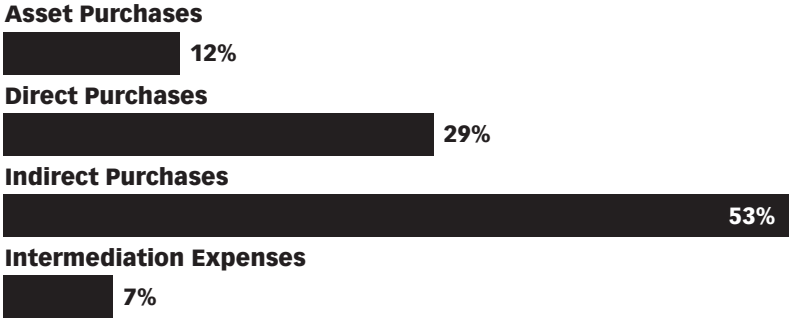


Source: Center for Advanced Purchasing Studies, 1999

eCommerce Technology Penetration Rates for the US Retail/Wholesale Industry, 1999

Source: International Data Corp. (IDC), 1999

US Consumer Goods Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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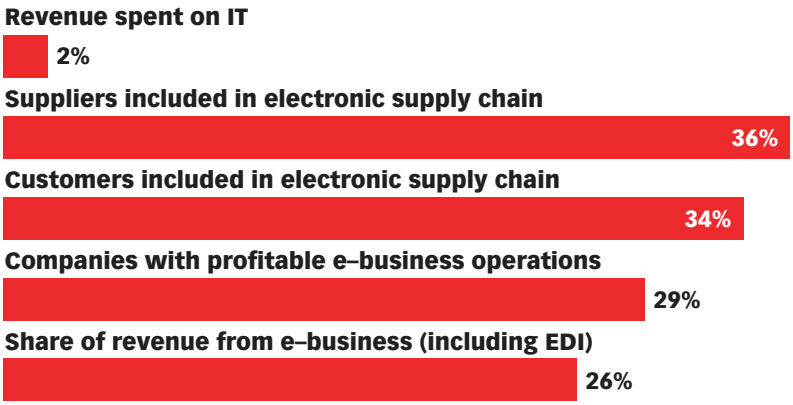
US Wholesale and Retail Services Industry Spending, 1996 (as a % of total industry spending)

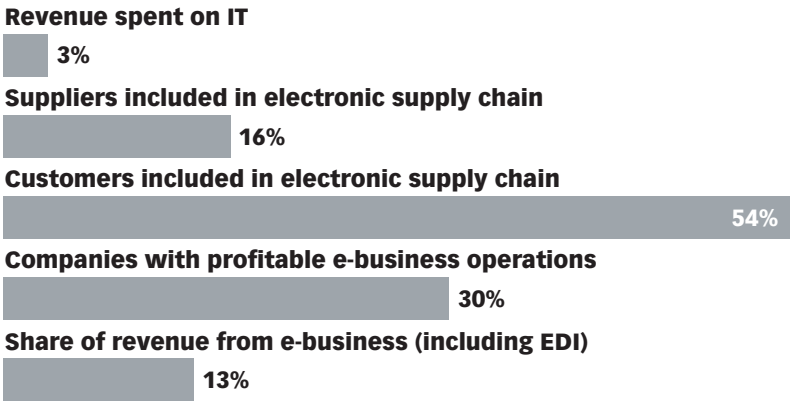
Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders in the US Consumer Goods Industry, 2000



Source: InformationWeek, 2000

IT Spending and eBusiness Revenues among Technology Leaders in the US Retail, General Merchandising Industry, 2000



Source: InformationWeek, 2000

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Leading B2B Exchanges for the Retailing Industry
Consortia Exchanges
GlobalNetXchange
Worldwide Retail Exchange
Other Exchanges
7thonline.com
E7thShoes.com
EGarden.com
ForRetail.com
GemConnect.com
HomePoint
USgift.com
Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Energy

The $136 billion U.S. energy industry, which includes oil, gas, electricity, and mining, is being pushed online by a mix of company-operated exchanges and industry consortia. Among the first entrants were Enrononline.com, the world's largest e-commerce website for commodity transactions, and Altra Energy, a private company which offers an independent online trading platform where customers meet online to trade natural gas, natural gas liquids, power and crude oil. Meanwhile, a consortium of six of the top ten US energy companies has partnered to launch an Internet-based trading exchange for gas, electricity, and other energy-related commodities.

Comparative Estimates: % of Internet-Based B2B Revenues for the US Energy Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Oil/gas/mining	4.5%	16.0%
Forrester Research	Petrochemicals	1.9%	16.9%

Source: eMarketer, 2001; various, as noted.

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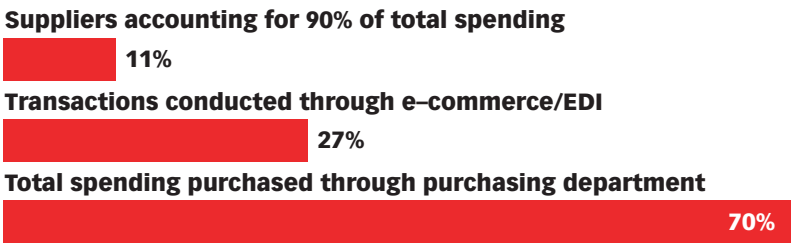
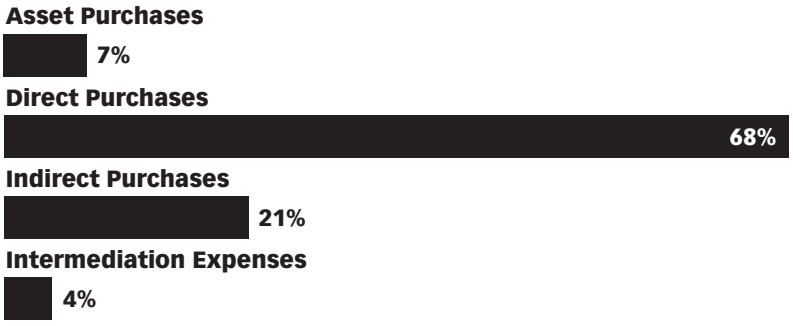
Purchasing Data for the US Petroleum Sector, 1999



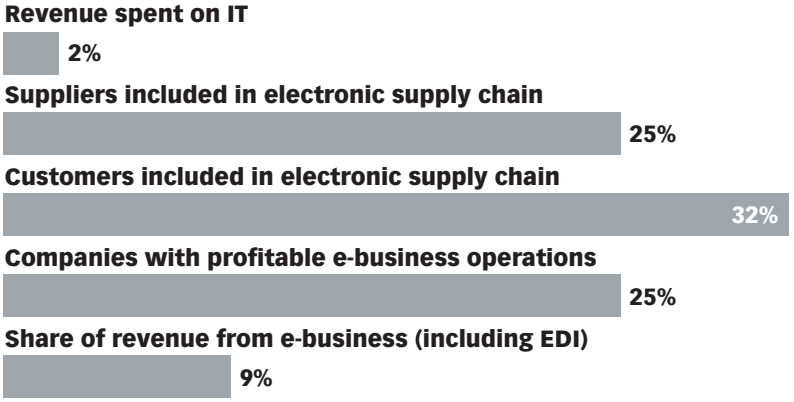
Source: Center for Advanced Purchasing Studies, 1999

US Petroleum Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders in the US Energy Industry, 2000



Source: InformationWeek, 2000

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Leading B2B Exchanges for the Energy Industry
Consortia Exchanges
Emporium
Petrocosm
Trade–Ranger
Other Exchanges
Altra Energy
Enron Online
HoustonStreet.com
IndigoPool.com
PetroleumPlace
RedMeteor.com
Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Food and Beverage

According to Forbes magazine, the global food industry is estimated to be worth $800 billion, while the worldwide trade in alcoholic beverages is worth $600 billion. Transora is one of the largest consortia exchanges by founding membership, with over 50 of the biggest names in consumer packaged goods participating. Vertical niches have been filled in the food business
by exchanges such as GoFish.com for the seafood industry or the GlobalFoodExchange for trade in perishable food products.

Comparative Estimates: % of Internet-Based B2B Revenues for the US Food and Beverage Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Food/Beverage/Tobacco mfg.	1.1%	1.6%
Forrester Research	Food and agriculture	1.4%	11.7%

Source: eMarketer, 2001; various, as noted.

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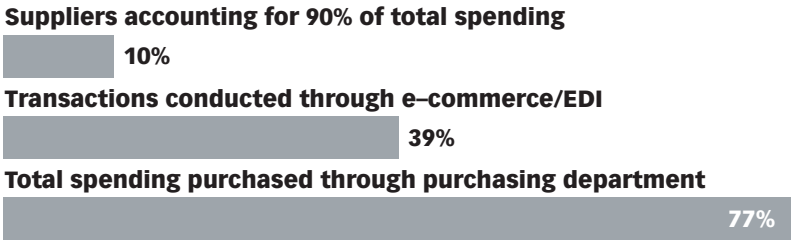
Purchasing Data for the US Food Manufacturing Sector, 1999

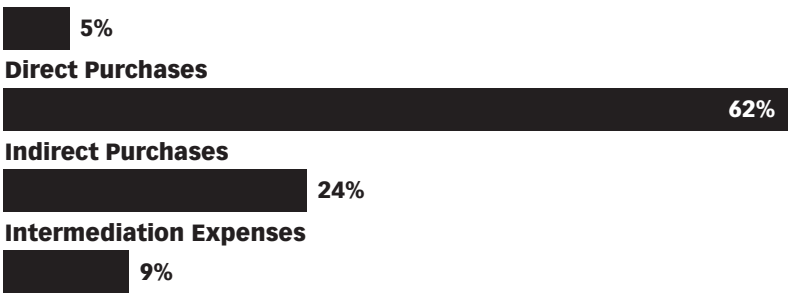
Source: Center for Advanced Purchasing Studies, 1999

Purchasing Data for the US Beverages Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

US Food and Beverage Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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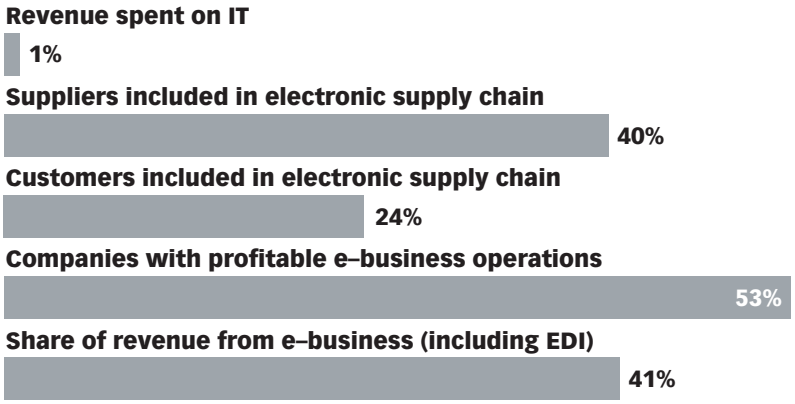
IT Spending and eBusiness Revenues among Technology Leaders in the US Food and Beverage Processing Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Food and Beverage Industry

Consortia Exchanges
Transora
Novopoint
Other Exchanges
Bevaccess
Buyproduce
EcFood.com
ESkye
FoodTrader.com
FoodUSA.com
GlobalFoodExchange.com
Gofish.com
ICS FoodOne.com
ProduceOnline.com

Source: Forbes, 2000; eMarketer, 2001

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Industry Brief: Financial Services

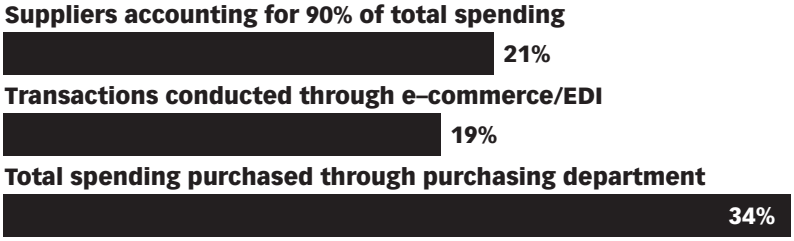
The online trade of financial products and services between industry players has moved slowly, in part due to the established offline electronic networks that remain as competitors. Nonetheless, the first effort at online collaboration has been TradeWeb, an online bond exchange that is supported by the biggest names on Wall Street, including Morgan Stanley Dean Witter, Merrill Lynch, and Goldman Sachs. Smaller marketplaces have been established for the trade of such investment products as municipal bonds, second mortgages, and even entire loan portfolios.

Comparative Estimates: % of Internet-Based B2B Revenues for the US Financial Services Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Financial services	1.2%	10.9%
Forrester Research	Finance, insurance, real estate	–	24.5%

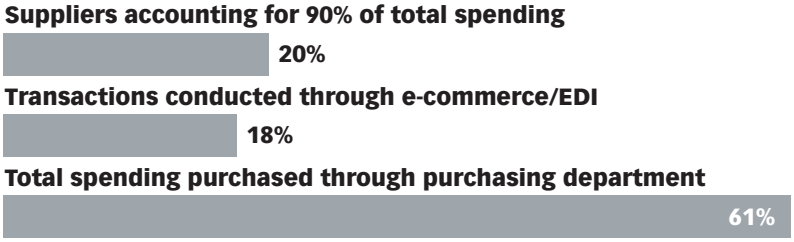
Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Banking Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

Purchasing Data for the US Life Insurance Sector, 1997



Source: Center for Advanced Purchasing Studies, 1997

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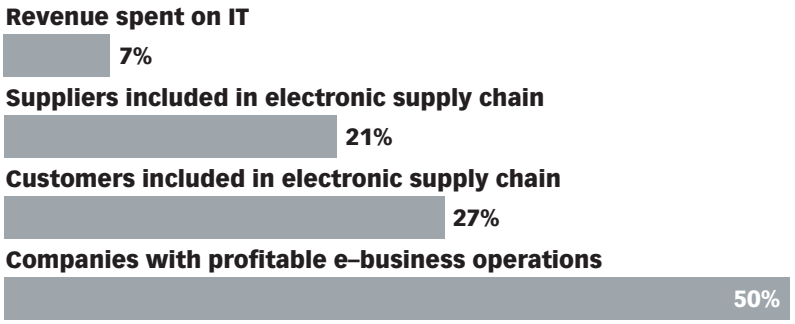
US Finance and Insurance Industry Spending, 1996 (as a % of total industry spending)

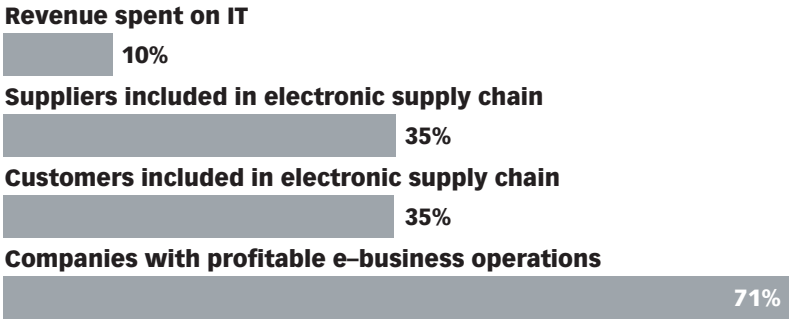
Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders in the US Banking Industry, 2000



Source: InformationWeek, 2000

IT Spending and eBusiness Revenues among Technology Leaders in the US Financial Services Industry, 2000



Source: InformationWeek, 2000

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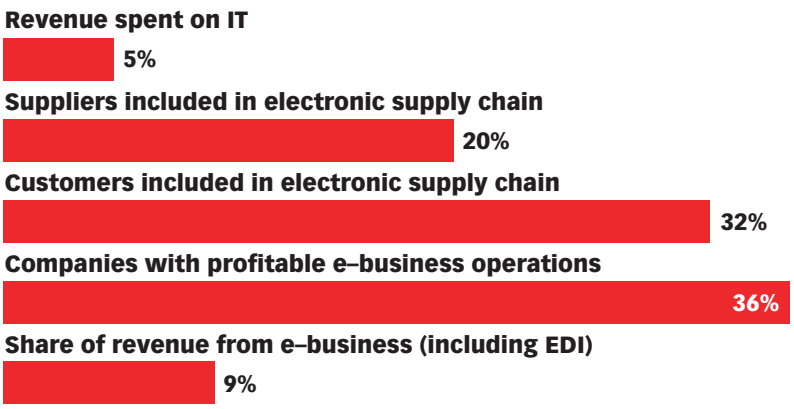
IT Spending and eBusiness Revenues among Technology Leaders in the US Insurance Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Financial Services Industry

Bloomberg.com
Catex
Creditex
Ecredit
Elease
GE Small Business Solutions
MuniAuction
TradeWeb

Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Industrial Equipment

Because of the complexity and cost of industrial equipment, these products are not readily traded online as new goods. However, the associated parts and surplus market has provided fertile ground for the creation of auction-based exchanges. Perhaps the best-known industrial equipment auction is the Online Asset Exchange, which serves 14 vertical industries and has over $12 billion in assets available for sale.

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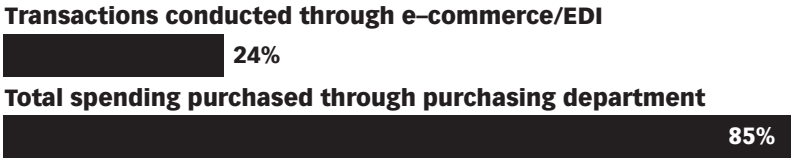
Comparative Estimates: % of Internet-Based B2B Revenues for the US Industrial Equipment Industry, 2000 & 2004

	Industry Definition	2000	2004
Forrester Research	Heavy industries	0.4%	2.7%
Forrester Research	Industrial equipment/supplies	0.9%	7.2%
Goldman Sachs	Industrial equipment	1.3%	12.0%
AMR Research	Industrial equipment	–	40.0%

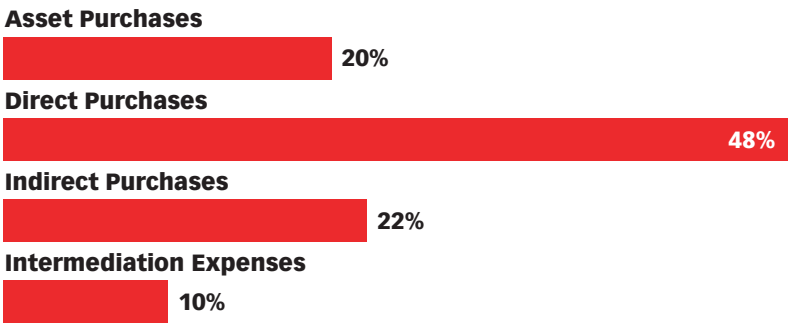
Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Machinery Sector, 1998



Source: Center for Advanced Purchasing Studies, 1998

US Machinery, Equipment, and Supplies Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

Leading B2B Exchanges for the Industrial Equipment Industry

AssetTrade
BigEquip.com
BigMachines
CapacityWeb
Esprocket
FreeMarkets
IndustrialVortex

Source: Forbes, 2000; eMarketer, 2001

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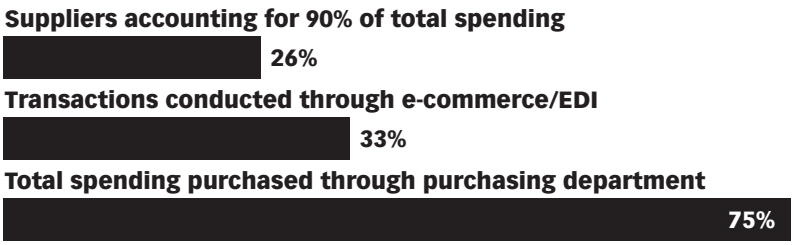
Industry Brief: Metals and Mining

Some estimates predict that the volume of online steel trade may reach as high as 40% to 60% of total industry sales. Due to the heavily regulated nature of the steel industry, most online steel exchanges have been forced to set up separate regional operations depending upon the global markets they serve. For example, e-Steel operates one exchange in the United States and another one in Belgium.

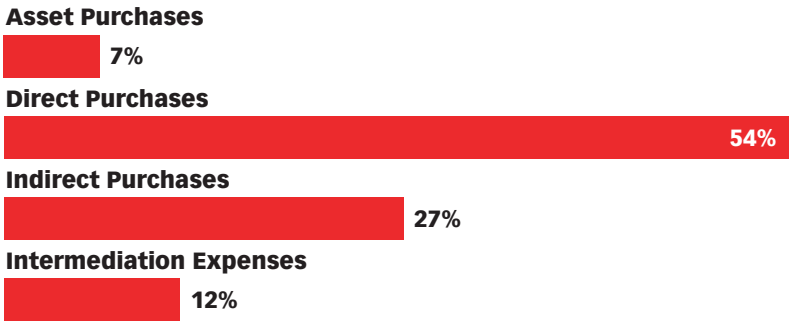
The two leading American steel exchanges, e-Steel and MetalSite, are backed by metal industry leaders, although each exchange describes itself as being independent. Much of the online trade in steel products is in surplus steel.

Purchasing Data for the US Carbon Steel Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

US Metal and Related Products Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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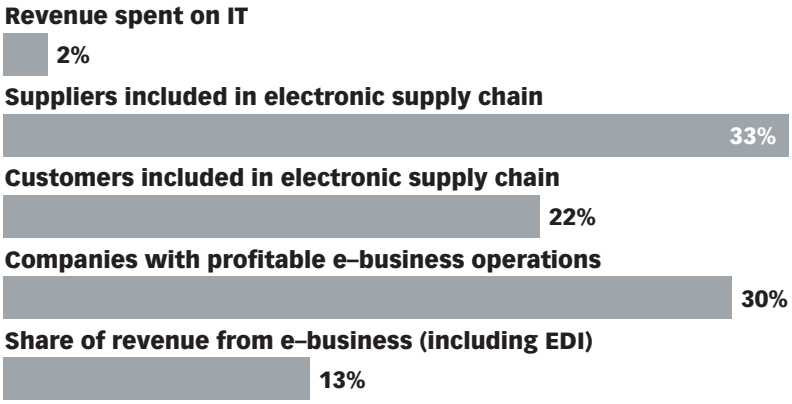
IT Spending and eBusiness Revenues among Technology Leaders in the US Metals and Natural Resources Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Metals Industry

Consortia Exchanges
MetalSpectrum
Mining (unnamed)
Other Exchanges
Aluminium.com
E–Steel
MaterialNet.com
Metal Suppliers Online
MetalSite
OnlineMetals.com

Source: Forbes, 2000; eMarketer, 2001

Industry Profile: Pharmaceutical and Medical Products

According to Forbes magazine, health care is the largest vertical industry within the US economy, accounting for 16% of GDP. Because of the high degree of administrative costs associated with the medical industry, the internet offers a substantial opportunity to generate greater efficiencies through improved communications. By some accounts, the number of health care websites reached over 15,000 in 2000. The online leader for medical industry e-commerce is WebMD, whose online revenues were projected to exceed $300 million last year. With industry giants such as Johnson and Johnson, GE Medical Services, Tyco Medical, and Bayer signed on, the Global Healthcare Exchange represents the medical industry's consortium effort.

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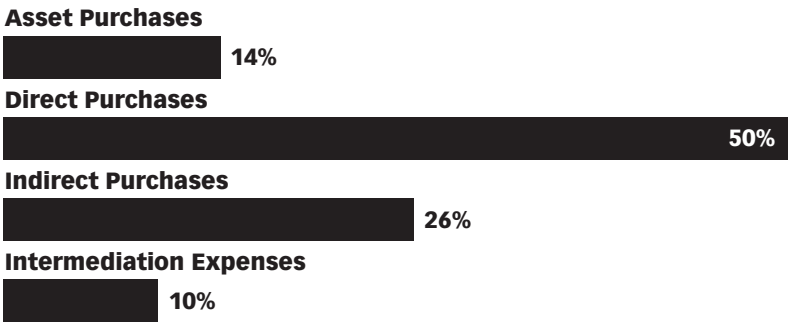
Independent exchanges for the health care industry have met with mixed success. While Chemdex has ceased operations, SciQuest has continued to earn steady revenues, primarily as a builder of private pharmaceutical industry exchanges.

Comparative Estimates: % of Internet-Based B2B Revenues for the US Pharmaceutical Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Pharmaceutical	2.0%	8.5%
Forrester Research	Pharmaceutical and medical	0.7%	14.4%

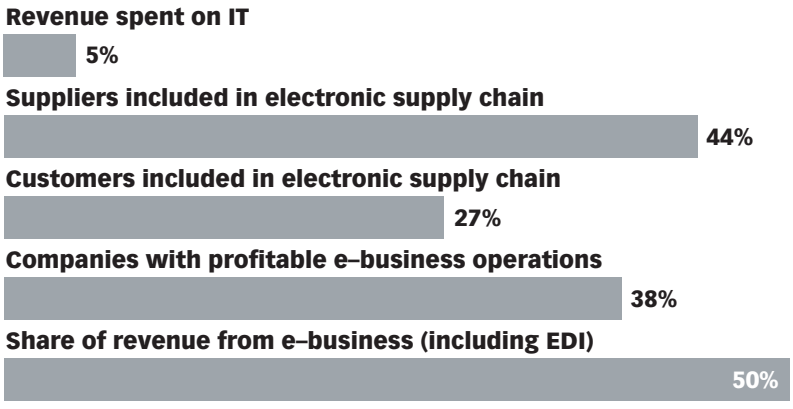
Source: eMarketer, 2001; various, as noted.

US Professional Equipment Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

IT Spending and eBusiness Revenues among Technology Leaders in the US Biotechnology and Pharmaceuticals Industry, 2000



Source: InformationWeek, 2000

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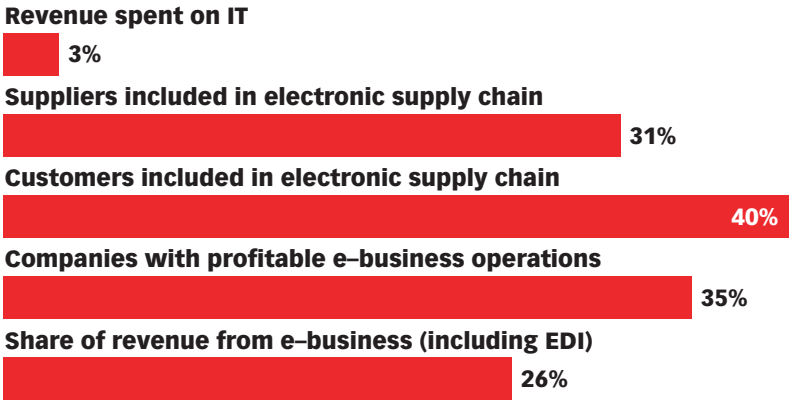
IT Spending and eBusiness Revenues among Technology Leaders in the US Health Care and Medical Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Medical Industry

Consortium Exchange
Global Health Care Exchange
Other Exchanges
AllScripts
CareInsite
Healtheon/WebMD
IDX
InfoCure
Medibuy.com
Neoforma.com
PoxyMed

Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Paper and Office Products

The global pulp, paper, and packaging industry is estimated at $500 billion. From sawmills to the world's largest forest companies to office supply firms, the paper products supply chain has arrived online with more than 20 separate exchanges. Founded by forest products companies Weyerhaeuser, Georgia-Pacific, International Paper, and Mead, ForestExpress is the industry's leading consortium exchange. So far the marketplace has only begun the implementation of its exchange platform as of late 2000. Independent marketplace, PaperExchange has been operating since 1998, serving the trading needs of pulp and paper industry players online.

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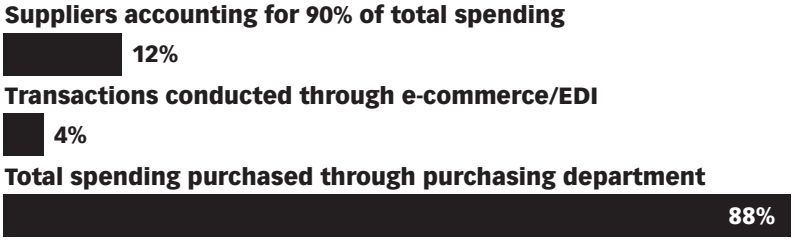
Comparative Estimates: % of Internet–Based B2B Revenues for the US Paper and Office Products Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Paper and office products	1.2%	12.2%
Forrester Research	Paper and office products	1.8%	23.7%

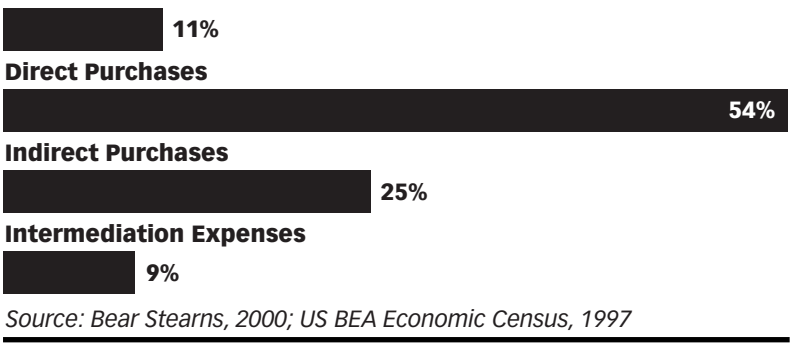
Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Paper Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

US Paper and Related Products Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

Leading B2B Exchanges for the Printing and Paper Industry

Consortium Exchange
Forest Express
Other Exchanges
58k.com
Collabria
Noosh
PaperExchange
printCafe

Source: Forbes, 2000; eMarketer, 2001

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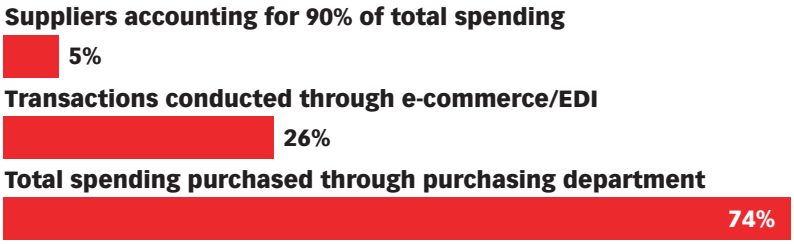
Industry Brief: Telecommunications

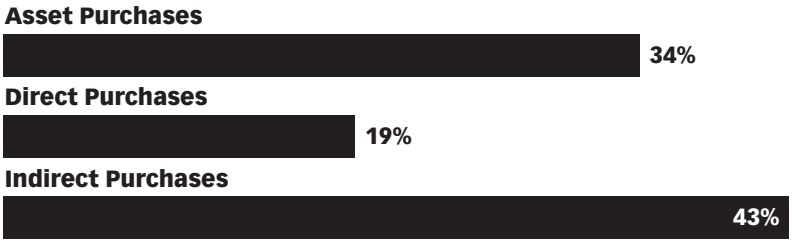
From electronic components to telecom equipment and unused bandwidth, business-to-business exchanges for telecommunications products and services have been quick to spot opportunities in this technologically advanced industry. Although the leading exchanges that sell telecom equipment are privately operated (Cisco Systems, for one), independent marketplaces such as Arbinet's bandwidth exchange have successfully brought buyers and sellers together on a global scale. The lone industry Consortium exchange, formed by partners AT&T and British Telecom, has become less of a trading exchange and more of an online joint-marketing effort that promotes the combined networks of both companies' global communications systems.

Purchasing Data for the US Telecom Services Sector, 1998



Source: Center for Advanced Purchasing Studies, 1998

US Communications Services Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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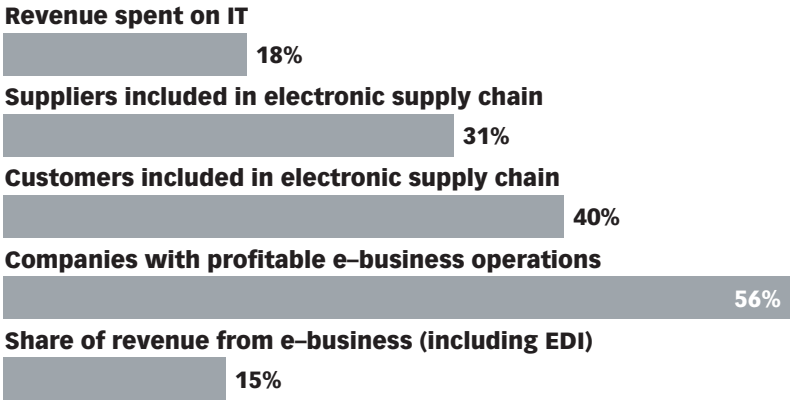
IT Spending and eBusiness Revenues among Technology Leaders in the US Telecommunications Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Telecommunications Industry

Consortium Exchange
Concert
Other Exchanges
Arbinet
Band–X
Cisco Systems Inc.
RateXchange
Telezoo.com

Source: Forbes, 2000; eMarketer, 2001

Industry Brief: Transportation and Warehousing

The transportation industry is a global industry that is fragmented among several vertical niches, including warehousing, trucking, railways, airfreight, and ocean freight. The transparency brought about through better communications is what the internet provides this industry, which relies on phone and fax networks to buy and sell unused space upon various means of transport. For example, empty trucks are being filled via the National Transportation Exchange's online network, while ocean container space is being auctioned via GoCargo's internet exchange. Consortia-led exchanges within several vertical niches have been late to arrive, but they have nonetheless been formed. Airlines, trucking companies, railroads, and ocean transport companies had all announced alliances by the last quarter of 2000.

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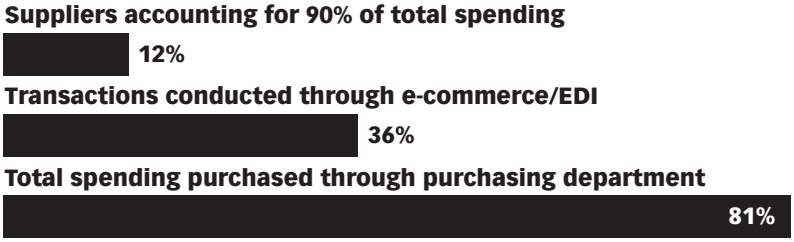
Comparative Estimates: % of Internet–Based B2B Revenues for the US Transportation Industry, 2000 & 2004

	Industry Definition	2000	2004
Goldman Sachs	Transportation/Freight	2.5%	11.0%
Forrester Research	Shipping and warehousing	1.5%	19.7%

Source: eMarketer, 2001; various, as noted.

Purchasing Data for the US Transportation Sector, 1998

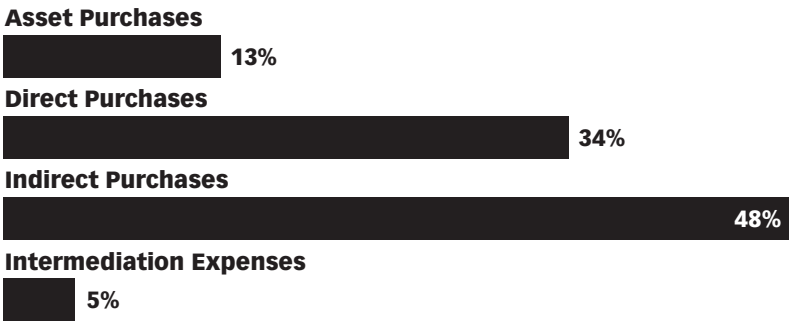


Source: Center for Advanced Purchasing Studies, 1998

eCommerce Technology Penetration Rates for the US Transportation, Telecommunications, Media, and Utilities Industries, 1999

Source: International Data Corp. (IDC), 1999

US Transportation Services Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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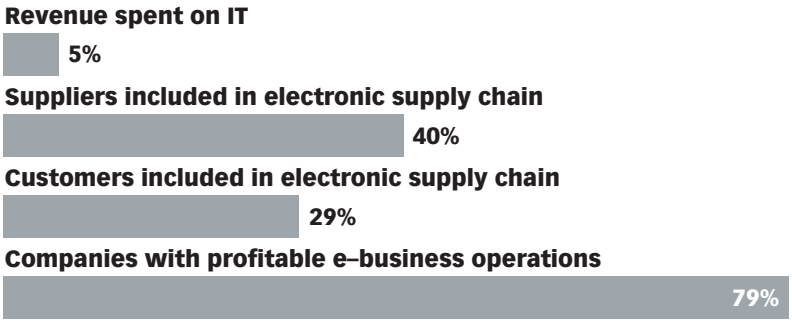
IT Spending and eBusiness Revenues among Technology Leaders in the US Logistics and Transportation Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Transportation Industry

Consortia Exchanges
Railroads (unnamed)
Aeroxchange
eVoyager
Transplace.com
Other Exchanges
Celarix
CH Robinson
FreightDesk.com
FreightMatrix
Freightquote.com
FreightWise
GoCargo.com
Logistics.com
National Transportation Exchange

Source: Forbes, 2000; eMarketer, 2001

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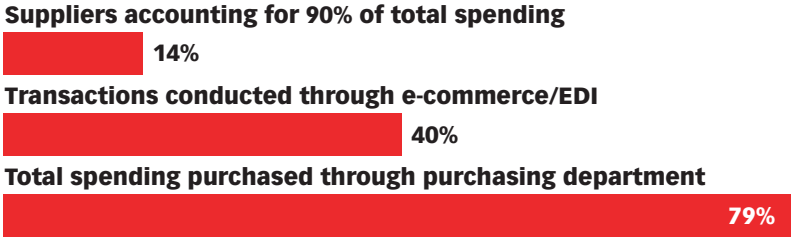
Industry Brief: Utilities

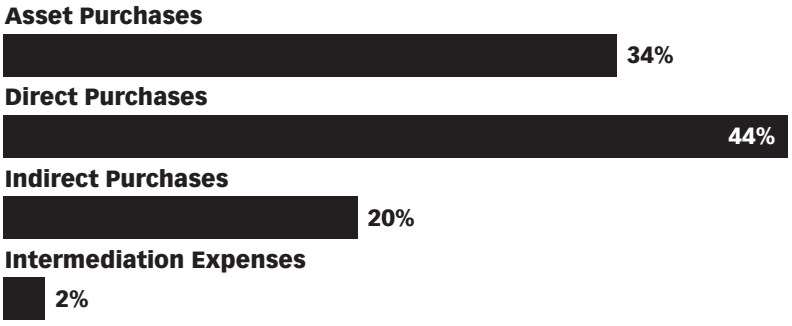
With deregulation throwing open the doors to competition in the utilities industry, old players are looking to use any advantage that they can to streamline their operations and improve efficiencies. The internet is one such tool that they are already using. Pantellos is the leading utilities exchange in North America, founded by more than 20 of the largest incumbent power companies. Its primary focus is to help utilities manage their supply chains more efficiently. Other independent exchanges have begun to facilitate the online trade of electricity, with Altra Energy being the most successful example (see Chapter 6 for a profile).

Purchasing Data for the US Utilities Sector, 1999



Source: Center for Advanced Purchasing Studies, 1999

US Utilities Industry Spending, 1996 (as a % of total industry spending)



Source: Bear Stearns, 2000; US BEA Economic Census, 1997

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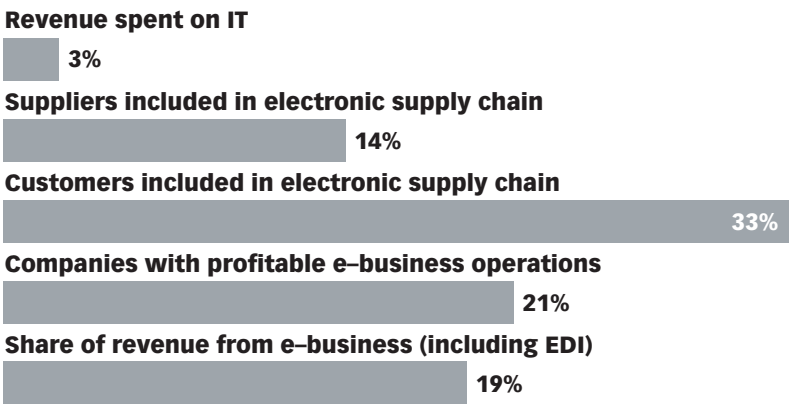
IT Spending and eBusiness Revenues among Technology Leaders in the US Utilities Industry, 2000



Source: InformationWeek, 2000

Leading B2B Exchanges for the Utilities Industry

Consortia Exchanges
Achilles Marketplace (Europe)
Pantellos (North America)
Unnamed (Europe) ENEL, EDF, Northern Electric
Other Exchanges
Automated Power Exchange
E–ChoiceNet
Enermetrix

Source: Forbes, 2000; eMarketer, 2001

Industry Brief: General Manufacturing and Wholesale Distribution

The following information applies to manufacturing in general, which may be spread across multiple industries, including aerospace, automotive, food and beverage processing, industrial equipment, computers and electronics, and telecommunications equipment.

eCommerce Technology Penetration Rates for the US Manufacturing Industry, 1999

Source: International Data Corp. (IDC), 1999

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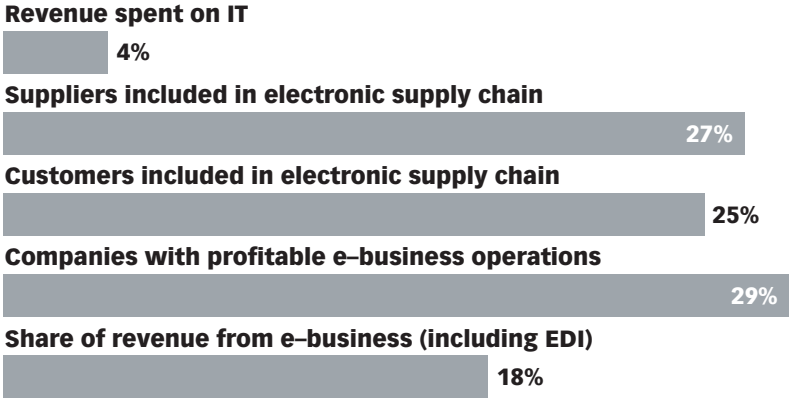
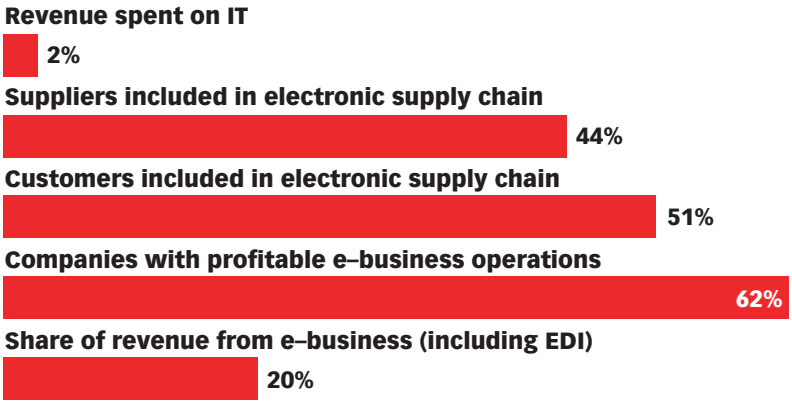
IT Spending and eBusiness Revenues among Technology Leaders in the US Manufacturing Industry, 2000



Source: InformationWeek, 2000

Similarly, the following information is applicable to the wholesale and distribution industry, which may in turn be applicable to multiple industries.

IT Spending and eBusiness Revenues among Technology Leaders in the US Distribution Industry, 2000



Source: InformationWeek, 2000

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Business Internet Penetration

The most common definitions for business size used by internet research firms are based upon the number of employees per firm. This has been particularly useful for technology analysts, who are interested in measuring the degree to which computers and networking equipment are being used among the US workforce.

Small businesses are defined by eMarketer as companies with fewer than 100 employees, but with active payrolls, and able to support a significant e-commerce initiative. Small offices/home offices are excluded from this definition.

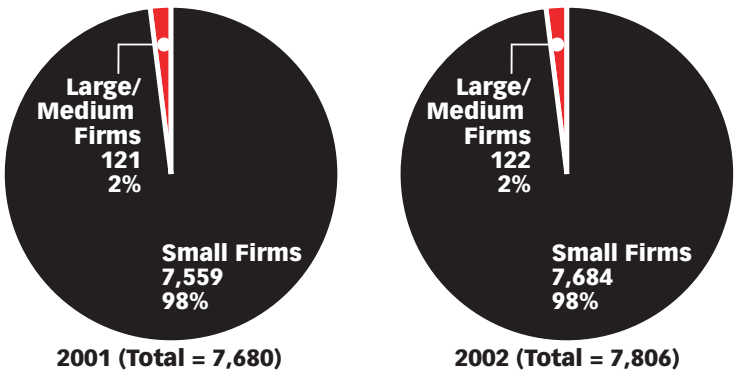
Defining the Number of US Businesses, 2001

Estimate	Description and Primary Source
5.4 – 6.1 million	Represents those with "active payrolls" according to US government records (e.g. "Employer Firms")
10 – 11 million	Includes above, plus additional firms that don't have active payrolls but do have "active" businesses, as calculated by Dun & Bradstreet (e.g. "SOHOs," "one-person shops, etc.")
16 million	All firms with phone service listings in the Yellow Pages
23 million	All self-employed persons reporting themselves as a "business" to the Internal Revenue Service
7.7 million	eMarketer's estimate for the number of "active' businesses with the potential to engage in some form of e-commerce over the next few years

Source: eMarketer, 2001; US Census Bureau; SBA; Dun & Bradstreet; IRS; Commerce Inc.

Of the 7.7 million US businesses that are capable of e-commerce in the United States, eMarketer counts 121,000 medium and large companies. Medium-sized firms are defined as firms with 100 to 500 employees, while large businesses have more than 500 employees. Small businesses make up 98% of all US companies.

US Businesses by Size, 2001–2002 (in thousands)



Source: eMarketer, 2001

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Number of US Businesses Connected to the Internet

eMarketer considers a business to be connected to the internet if a significant portion of senior level employees are actively using the internet on a regular basis to conduct research, gauge competitive activity, gather customer acquisition data or for other business purposes.

In 2001, the expected number of US businesses connected to the internet is projected to reach more than 6.0 million, or 78.3% of all American businesses.

Number of US Medium/Large-Sized Businesses Connected to the Internet, 2000–2003 (as a % of total medium/large-sized firms)

Source: eMarketer, 2001

Number of US Small Businesses Connected to the Internet, 2000–2003 (in thousands and as a % of total small businesses)

Source: eMarketer, 2001

Comparative estimates show that as of 2000, well over 90% of medium and large businesses were connected to the internet in the United States. The range of small firms that are connected to the internet as of 2000 is between 60% and 65% of companies.

Comparative Estimates: Medium/Large Firms Connected to the Internet, 2000 (as a % of All Firms)

Sources: eMarketer, 2000; various, as noted

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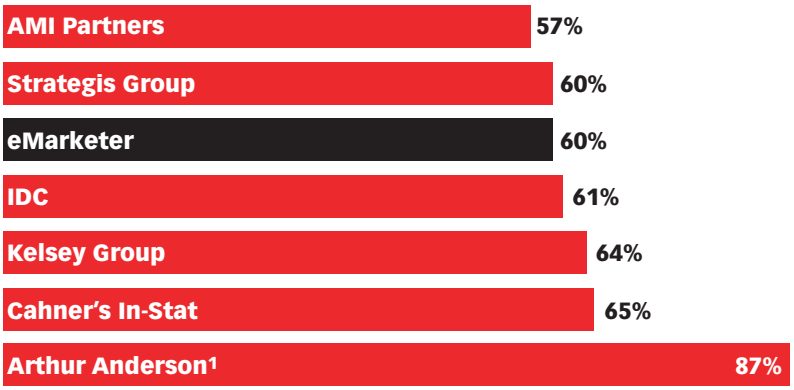
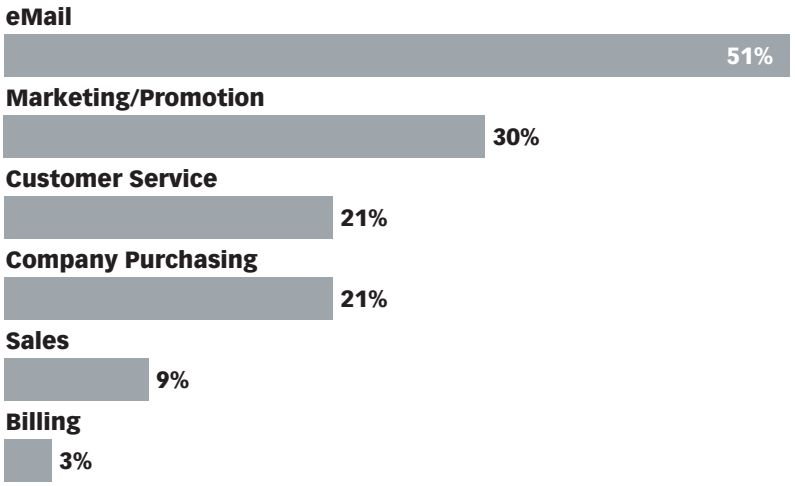
Comparative Estimates: Percent of Small Firms Connected to the Internet, 2000



[1] Includes both small- and medium-sized companies.
Sources: eMarketer, 2000; various, as noted

The vast majority of small businesses use the internet for e-mail and promotional activities. As their internet presence evolves over time, many establish websites and then move on to some kind of e-commerce activity.

Small Business Use of the Internet, 2000



Source: PSI Global, 2000

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Number of US Businesses with Active, Purposeful Websites

For many firms, an "active, purposeful" website may be all that they require for their web presence. Such websites go beyond so-called "brochure ware" or the provision of basic company information to provide at least one of the following:

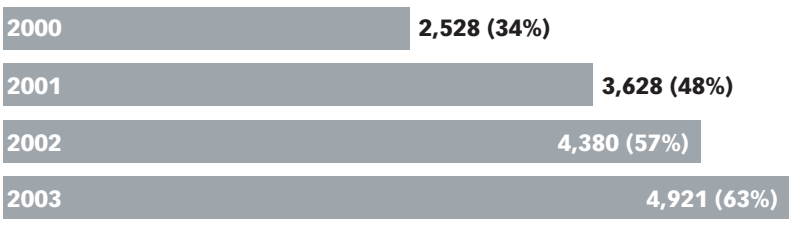
- Interactive customer service or support
- A meaningful display of the firm's products or services
- Regularly updated information

With the cost of website software applications coming down, increased numbers of small businesses are able to afford their own websites via hosted solutions. eMarketer has continued to observe significant growth in the number of firms with increasingly sophisticated websites. For many companies, a web presence will complement offline advertising as clients and other contacts are directed to a website via simple promotional means such as business cards, company letterhead, or packaging.

Number of US Medium/Large-Sized Businesses with Active, Purposeful Websites, 2000–2003 (as a % of total medium/large-sized firms)

Source: eMarketer, 2001

Number of US Small Businesses with Active, Purposeful Websites, 2000–2003 (in thousands and as a % of total medium/large-sized firms)



Source: eMarketer, 2001

The range of estimates for the percent of firms with websites varies, as do the definitions of what constitutes an active, purposeful website. While eMarketer's more conservative definition places the percent of medium and large firms at 57% in 2000, the Yankee Group estimated that 62% of medium and large companies had a website in 1999. Deloitte and Touche put this number at 44%.

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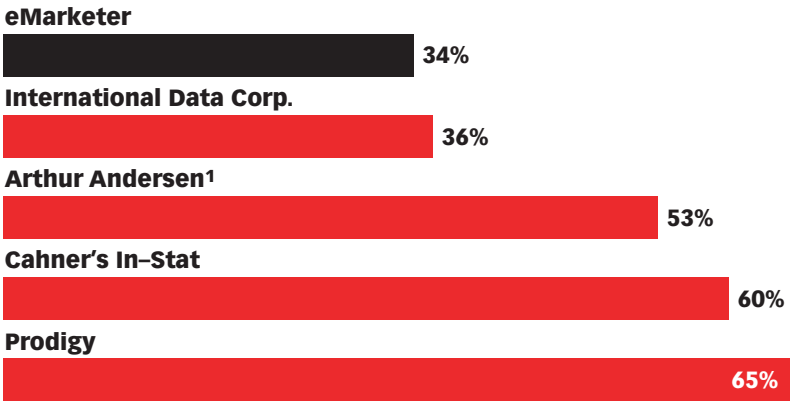
Comparative Estimates: Percent of Medium/Large-Sized Firms with a Website, 2000

Source: eMarketer, 2001; various, as noted

When most research firms survey the number of small companies with websites, it is typically defined as any kind of web presence, regardless of whether it is actively updated or not. In 1999, Prodigy estimated that 37% of small companies operated a website, compared to PSI Global's estimate of 32%.

Comparative Estimates: Percent of Small Firms with a Website, 2000



1 Includes both small– and medium–sized firms
Source: eMarketer, 2001; various, as noted

Number of US Businesses Engaged in eCommerce

A company is defined as conducting e-commerce if it is doing some kind of buying or selling via the internet. Sales may be conducted on a firm's website, through an online network such as an extranet, or with an online exchange. Similarly, purchasing must be conducted over the internet. In both cases, the final agreement, purchase order, or contract must be established online, according to eMarketer's definition.

The number of American firms purchasing online will rise significantly between the years 2000 and 2001, as companies begin to implement the e-commerce strategies that they started to plan in 2000. By 2003, 6.3 million US businesses will be engaged in e-commerce of some kind.

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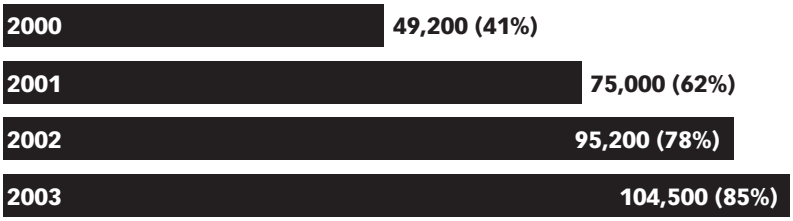
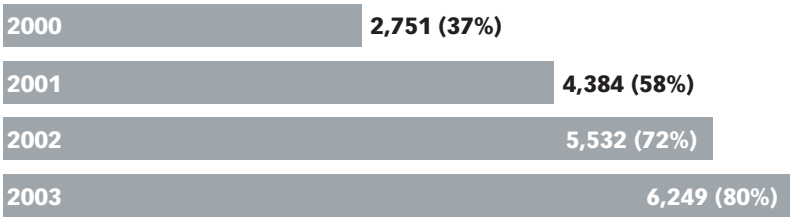
Number of US Medium/Large-Sized Businesses Engaged in eCommerce, 2000–2003 (as a % of total medium/large-sized firms)



Source: eMarketer, 2001

Number of US Small Businesses Engaged in eCommerce, 2000–2003 (In thousands and as a % of total small firms)



Source: eMarketer, 2001

Comparative estimates show that roughly 40% to 60% of medium and large businesses are conducting e-commerce.

Comparative Estimates: Percent of Medium/Large-Sized Firms Conducting eCommerce, 2000

Source: eMarketer, 2001; various, as noted

Comparing the estimates between small businesses is much more difficult, due to the diverse range of definitions for what constitutes an e-commerce transaction, and the regularity of e-commerce activity. Data from 1999 is robust, however estimates of online activity in 2000 are more difficult to find. Updating their research from 1999, ActivMedia estimates that 67% of small companies were purchasing online in 2000 while Arthur Andersen has found that 46% of small and medium-sized firms were conducting e-commerce in 2000.

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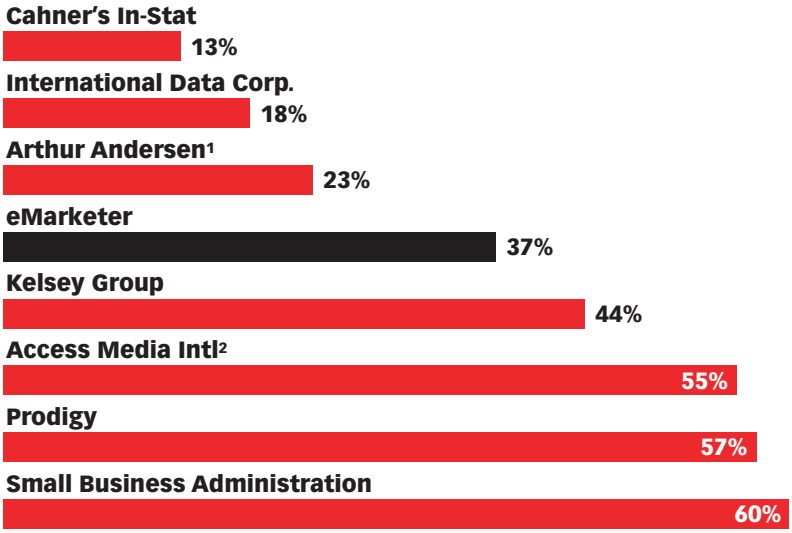
Comparative Estimates: Percent of Small Firms Conducting eCommerce, 2000



[1] Small- and medium-sized firms [2] Small Firms Purchasing Online
Source: eMarketer, 2001; various, as noted

In most of these estimates, the number of firms engaged in e-commerce are biased toward firms that are purchasing online. eMarketer has found that within the next three years, 80% to 90% of US businesses will be buying online, while 30% to 40% of US companies will be selling via the internet.

Percent of US Firms Buying vs. Selling Online, 2003

Source: eMarketer, 2001

Non-strategic purchasing, or indirect procurement, is currently the primary driver behind e-commerce activity. While not all businesses have products or services that they can sell via the internet, many companies will find it convenient to purchase basic items such as office supplies or computer equipment online.

Direct procurement, discussed in greater detail in Chapter 6, will be a driver of online sales, as purchasers demand that their trading partners offer product for sale via the internet. These more complex transactions will often be negotiated offline, but fulfilled or replenished online.

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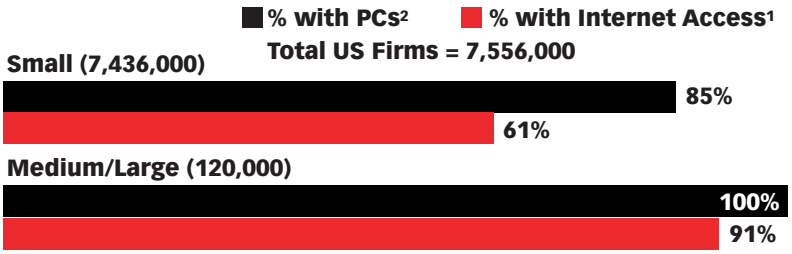
Workplace Demographics

Measuring the number of employees with internet access has proven to be a daunting task because this can vary from firm to firm. At some companies, multiple users access the internet from a single station. Other companies severely restrict internet use, for both productivity and security reasons.

To indicate the potential for workplace internet use, there are roughly 6.4 million US companies, or 85% of all firms with personal computers. Last year, 60.5 % of all companies had internet access at least at the senior management level.

PC Penetration among US Businesses, 2000 (as a % of total businesses)

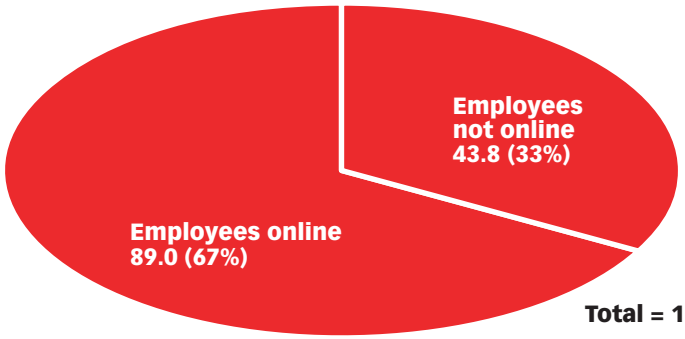


Sources: (1) eMarketer, 2000 (2) International Data Corp., 2000

Similar survey data from Arthur Andersen supports the findings of IDC, showing that 88% of small and medium-sized businesses have computers, with 39% of all businesses operating a network.

When considering the number of American employees with internet access as a percentage of the entire workforce, Cahner's In-Stat has found that only one- third of all US workers, or 43.8 million people, have yet to gain access to the internet. This estimate is likely at the high side of the range, as many of these employees may have workplace internet access, but may not have regular access to the internet.

US Employees Online, 2000 (in millions and as a % of workforce)



Source: Cahner's In–Stat, 1999

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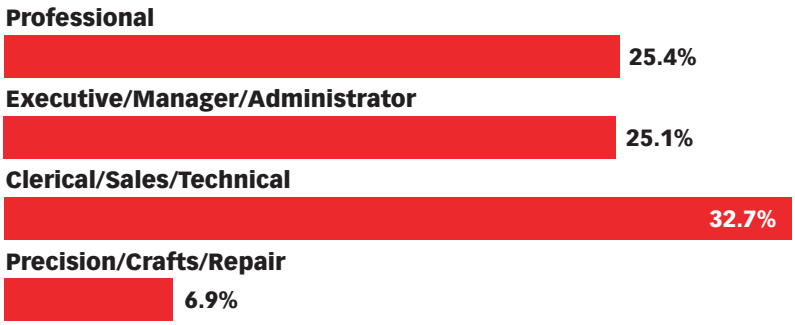
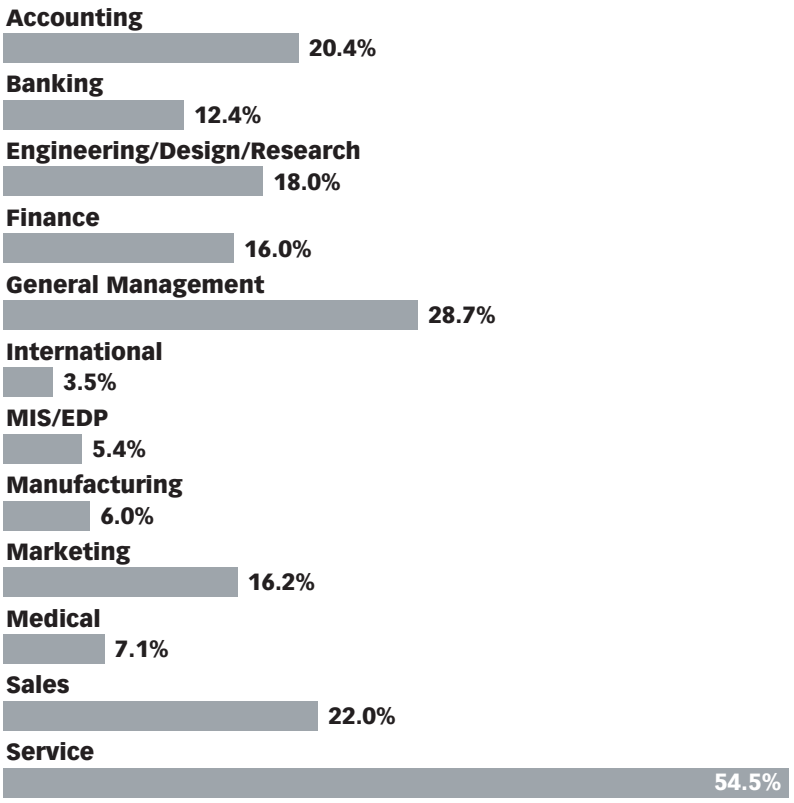
As might be expected, services industry employees and professionals have a higher proportion of internet access than their trades-based counterparts.

US Workplace Internet Access, 2000 (by occupation)



Source: Mediamark Research, Fall 2000

US Workplace Internet Access, 2000 (by job description)



Source: MediaMark Research, 2000

Income-level data further support the findings that lower-paying jobs are less likely to have internet access at work. Workplaces that require employees to use personal computers are therefore more likely to include internet access over the long term.

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US Internet Use at Work, August 2000 (by household income level)

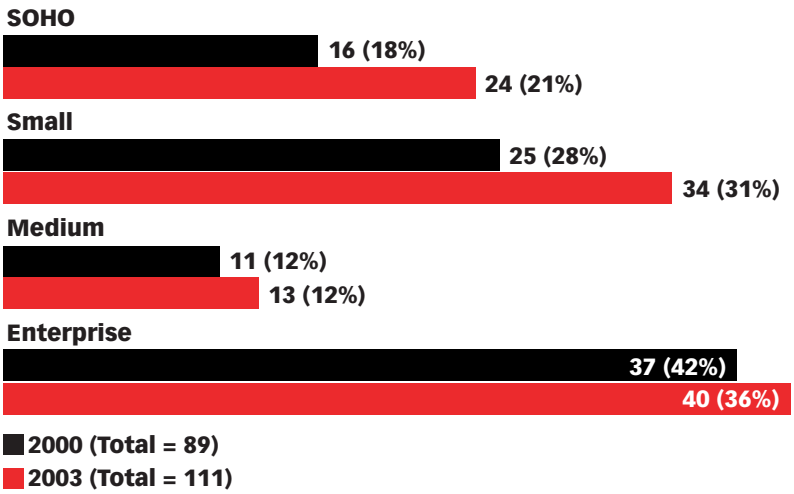
Annual Household Income	% of Respondents Using Internet at Work
Less than $15,000	2.1%
$15,000 – $24,999	4.0%
$25,000 – $34,999	7.8%
$35,000 – $49,999	11.1%
$50,000 – $74,999	16.5%
Greater Than $75,000	29.6%

Source: NTIA and ESA, US Department of Commerce, August 2000

In its comprehensive study of individual internet use, the National Telecommunications and Information Administration (NTIA) found in August that 12.3% of the US population, or 23.9% of the workforce, accessed the internet at work.

When assessing at-work internet access by company size, it is not surprising that Cahner's In-Stat has found that the largest enterprises have the greatest proportion of their staffs online. However, medium-sized firms are laggards compared to not only small businesses, but small office/home offices as well.

Number of US Employees Online by Size of Business, 2000 & 2003 (in millions and as a % of all employees)



Source: Cahner's In-Stat, 1999

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The strength in numbers of SOHOs with internet access is likely related to the lower cost and complexity of hooking up a single residential computer to the internet, as compared to a multi-user business. The smallest offices have the advantage of not requiring the expense of establishing an internal office network. Conversely, the difficulties associated with establishing an internal network may account for the lower tendency of medium-sized firms to have the lowest proportion of at-work internet access.

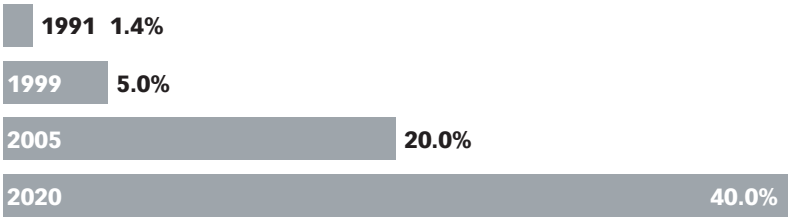
Percent of US Home Offices with Internet Access, 1996-2004

Source: International Data Corp., 2000

The percentage of home-based or remote workers is set to grow over the coming years, as telecommuting becomes a more viable alternative for many workers. The International Telework Association and Council estimated in late 2000 that 16.5 million Americans, or 12% of the workplace, worked at home one or more days per month.

IDC predicts that 92% of all American home offices will have internet access by 2004, while Coates & Jarratt estimates that as many as 53.1 million people will work from home within the next 20 years.

Home-Based Workers, 1991–2020 (as a % of the total US workforce)



Projection by Coates & Jarratt, Inc.
Source: 1991 Figures from Current Population Survey; 1999–2020

Projections for internet-access by job type can be derived by looking at the estimates for the number of telecommuters as well. Those jobs that permit telecommuting are also likely to include internet access, as a means of accommodating a remote access hookup.

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Number of Telecommuters in the US, 1999		
Technology Workers	320,000	5%
Professional Spec.	1,980,000	29%
Executives/Managers	2,740,000	40%
Marketing/Sales	740,000	11%
Clerical	830,000	12%
Blue Collar	220,000	3%
Source: Ziff Davis InfoBeads, 1999		

What is readily apparent from the available data, is that there is a digital divide within the workplace, between blue collar workers and those in the service industry and professions. Much of this is attributable, however, to the nature of work and whether or not it requires the use of a computer or internet-based technology.

C. Canada

Despite Canadian misgivings that their country is a technology laggard, Canada is in fact among the world's leaders in e-commerce. Not only does the Canadian private sector have a strong internet presence, so too does the Canadian government. Statistics Canada was the first national statistical agency to begin taking a comprehensive measure of internet activity within a major economy.

With close economic ties to its southern neighbor, Canada has seen up-front the benefits to be had through business-to-business e-commerce. Canadian companies have not only been brought online as a result of their close ties with American trading partners, there are several Canadian-owned companies that may be considered leaders in the New Economy.

As previously mentioned, the comparison of GDP data to e-commerce growth projections is misleading. However, for those who follow the macro-level progress of e-commerce, it is necessary to adjust forward-looking projections based upon growth in the overall economy.

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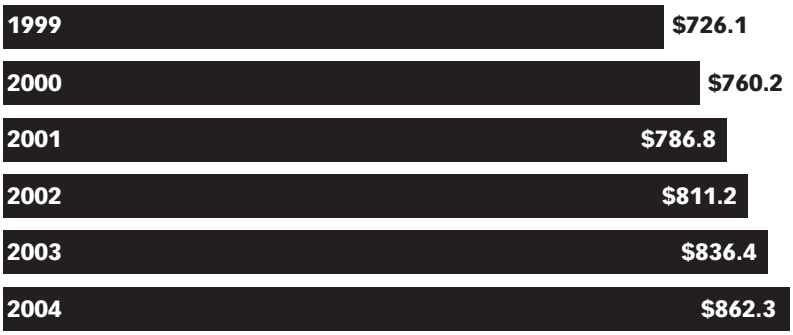
Canadian GDP, 1999–2004 (in US billions)

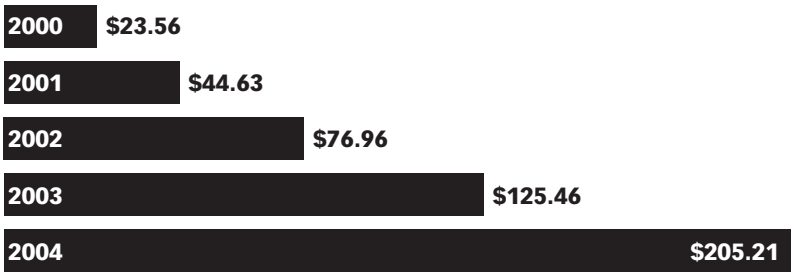


Note: GDP in 1999 prices and exchange rate
Source: World Bank, Finance Canada real GDP growth projections, 2000

But just as the United States is expected to see its early lead in e-commerce slip as other countries catch up, so too will Canada. IDC predicts that as a share of worldwide e-commerce, Canada will decline from 5.9% in 1999 to 3.9% in 2004.

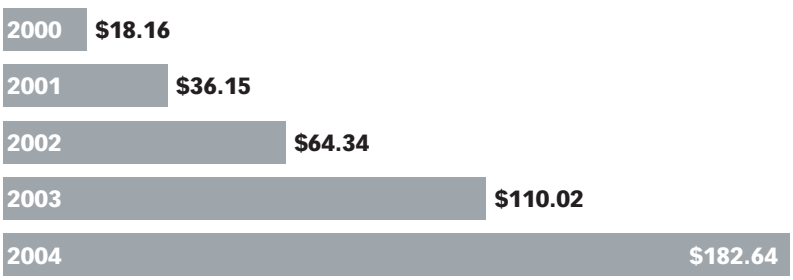
eMarketer has broken out Canadian e-commerce revenues, with the expectation that they will reach $205 billion by 2004. Business-to-business e-commerce will account for 89% of this figure at that time. IDC estimates total Canadian e-commerce to reach approximately $100 billion, or CAD $151.5 billion in 2004.

Canadian eCommerce Revenues, 2000–2004 (in US billions)



Source: eMarketer, 2001

Canadian B2B eCommerce Revenues, 2000–2004 (in US billions)



Source: eMarketer, 2001

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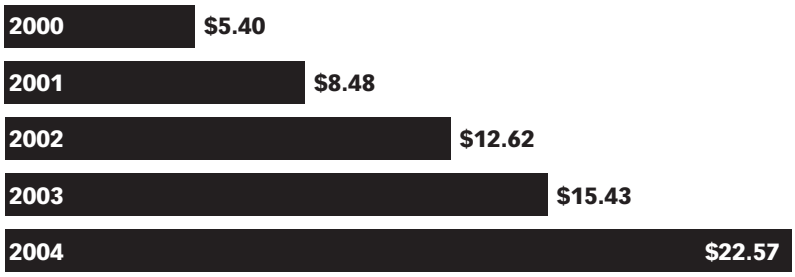
Canadian B2C eCommerce Revenues, 2000–2004 (in US billions)



Source: eMarketer, 2001

eMarketer's estimates for Canadian B2B e-commerce turn slightly more liberal than that of Forrester Research by 2002. The slower start for the adoption of e-commerce technologies by Canadian businesses will actually catch up to that of the United States in that year. The greater proportion of commodity-based industries within the Canadian economy will further add to the higher level of internet-facilitated transactions in Canada, as will its openness to international trade.

Comparative Estimates: Canadian B2B eCommerce, 2000–2004 (in US billions)

	2000	2001	2002	2003	2004
eMarketer	**$18.16**	**$36.15**	**$64.34**	**$110.02**	**$182.64**
Forrester Research	$16.00	$35.40	$63.40	$102.20	$149.80

Source: Forrester Research, eMarketer 2000

Forrester Research gives the United States a slight advantage over Canada in respect to the timing of its widespread adoption rate of e-commerce. Forrester's "hypergrowth" begins when more than 10% of companies within an economy are engaged in e-commerce. In the United States, this began in the year 2000, while in Canada it is projected to begin in 2001.

Percent of Total Commerce Traded Online in the US and Canada, 2004

Source: Forrester Research, 2000

IDC gives the United States an advantage in the rate at which e-commerce is adopted. Canada's compound annual growth rate for B2B e-commerce is projected to grow at 67.8%, versus 72.9% for the United States.

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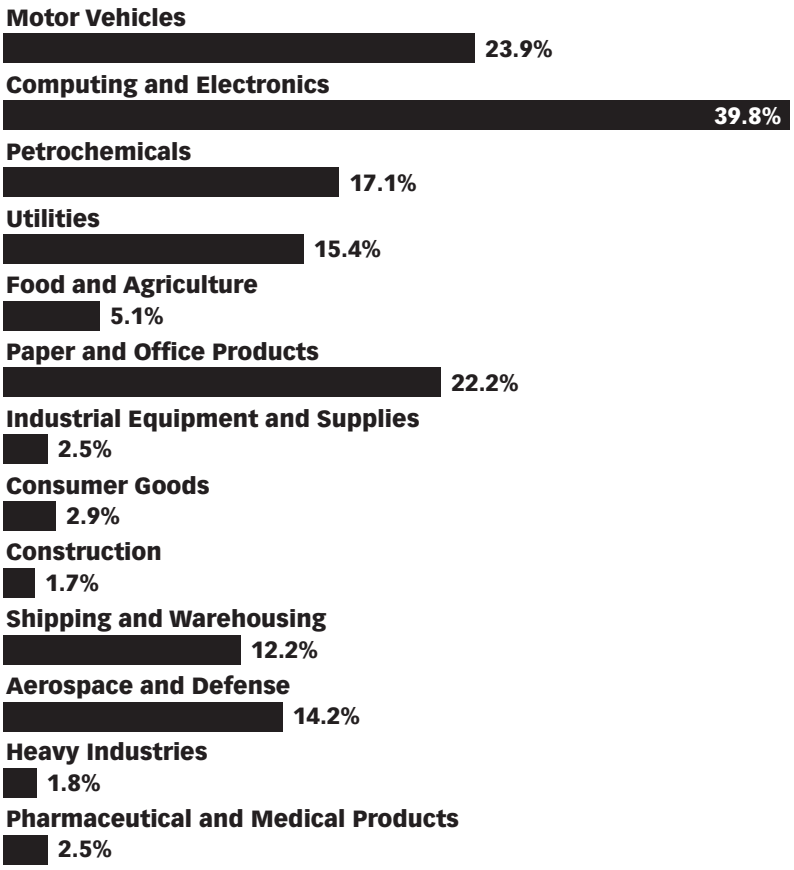
Comparing B2B eCommerce Growth Rates in the US and Canada, 1999–2004

Source: International Data Corp. (IDC), 2000

As in the United States, the computing and electronics industry is expected to lead online trade, with almost 40% of industry transactions conducted online. Because of its close ties to the American auto industry, the motor vehicle industry will also see a high level of internet penetration, comparable to the 30% penetration projected for the United States.

Estimated Online Portion of B2B Trade by Industry, 2004 (as a % of total Canadian industry trade)



Source: Forrester Research, 2000

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Top Industries

Statistics Canada has conducted the first comprehensive, industry-by-industry survey of e-commerce activity among the leading industrialized nations. Approximately 23,000 firms were surveyed from October 1999 to March 2000. Data was collected for the fiscal year 1999.

Using a tight definition of an e-commerce transaction that excludes non-internet EDI, Statistics Canada found that no industrial sector had internet sales exceeding 1.5% of total industry sales for 1999. Service-based industries had the highest proportion of e-commerce sales, as they accounted for those industries that primarily catered to consumers.

B2B Internet Sales in Canada, by Industry 1999 (in CAD billions)

	Internet Sales with or without Online Payment	Total Operating Revenue, 1999	Internet Sales as % of Total Operating Revenue
Manufacturing	$0.900	$568.346	0.2%
Retail Trade	$0.611	$231.622	0.3%
Information and Cultural Industries	$0.553	$55.910	1.0%
Accommodation and Food Services	$0.429	$32.474	1.3%
Professional, Scientific, and Technical Services	$0.406	$52.116	0.8%
Finance and Insurance	$0.321	$222.483	0.1%
Transport and Warehousing	$0.164	$65.268	0.3%
Wholesale Trade	$0.156	$290.440	0.1%
Real Estate, Rental, and Leasing	$0.115	$37.954	0.3%
Other Services (Except Public Administration)	$0.027	$37.439	0.1%
Utilities	$0.016	$24.499	0.1%
Mining and Oil and Gas Extraction	$0.015	$67.517	0.0%
Health Care and Social Assistance (Private Sector)	$0.010	$11.441	0.1%
Other Industry Sectors	$0.457	$104.577	0.4%
Total Private Sector	**$4.179**	**$1,802.086**	**0.2%**
Educational Services (Public Sector)	$0.126		
Health Care and Social Assistance (Public Sector)	$0.020		
Public Administration	$0.099		
Total Public Sector	**$0.245**		
Total	**$4.424**		

Other Industry Sectors: Admin. and support, waste management, arts, entertainment, and recreation, private educational services, management services, support services
Source: Statistics Canada, August 2000

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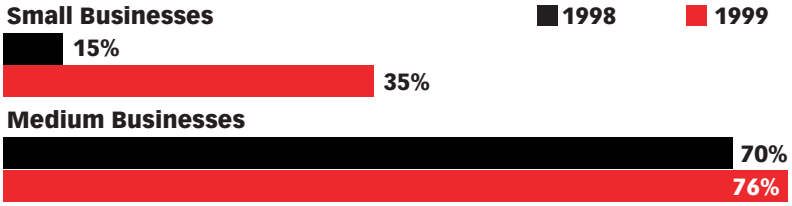
The manufacturing sector accounted for the highest proportion of total e-commerce activity, at 22% or CAD $900 million of the entire CAD $4.4 billion in online purchases. The retail industry accounted for 15% of total online sales, followed by the information and cultural industry (which includes much of online content, including ISP services) at 13% of internet sales.

Comparing the Canadian retail sector to that of the United States, the proportion of Canadian online B2C sales represented 0.2% of all retail sales for 1999. Fourth quarter retail sales in the US accounted for 0.6% of total e-commerce sales alone. The difference in the retail space may be attributed in part to the greater tendency of Americans to purchase catalog products, even prior to the birth of e-commerce.

Business Internet Use

Canadian internet use by businesses is healthy, with comparable PC penetration rates but a slight lack of internet use compared to that of their American counterparts. Among small businesses, IDC found that Canadian companies trailed American firms that had an internet penetration rate of 57% in 1999.

Percent of Small/Medium-Sized Companies Connected to the Internet, 1998 & 1999



Source: International Data Corp. (IDC), 2000

According to Statistics Canada, almost 53% of Canadian firms used the internet in 1999, compared with 42% of American firms. It should be noted, however, that Statistics Canada uses a more liberal definition of business internet use than eMarketer.

Canadian Businesses Connected to the Internet, 1999 (as a % of all private-sector enterprises)

Source: Statistics Canada, 2000

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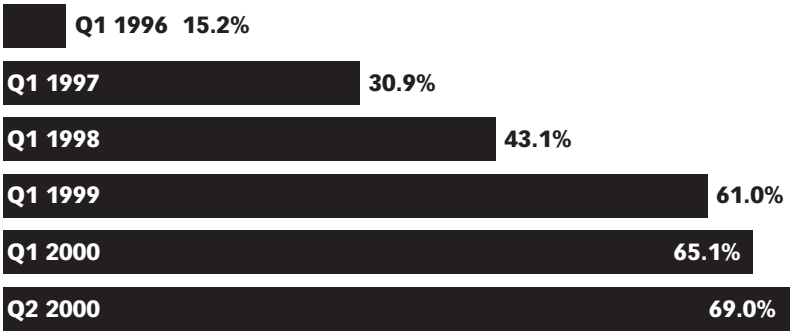
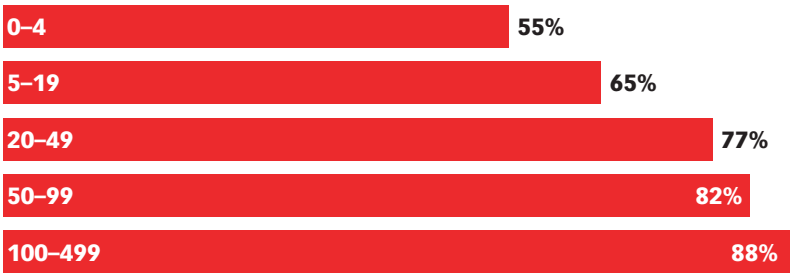
Most recently, the Canadian Federation of Independent Business (CFIB) found that 69% of Canadian small and medium-sized businesses (defined as firms with 1-500 employees) were connected to the internet, as of the second quarter of 2000.

Canadian Small/Medium-Sized Companies Connected to the Internet, Q1 1996–Q2 2000



Source: Canadian Federation of Independent Business (CFIB), 2000

Canadian Small/Medium-Sized Companies Using eMail, Q2 2000 (by number of employees)



Source: Canadian Federation of Independent Business (CFIB), 2000

Percent of Canadian Small/Medium-Sized Companies with Websites, 1998–1999

Source: International Data Corp. (IDC), 2000

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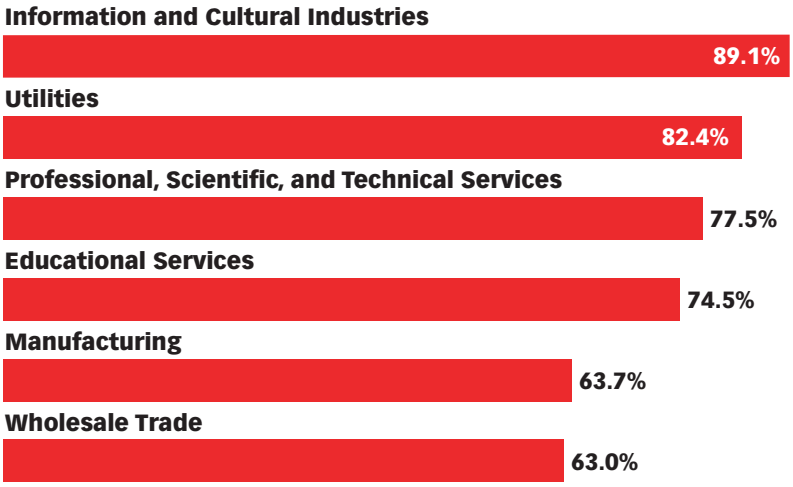
Overall, Statistics Canada found that 22% of Canadian companies had a website in 1999, with 53% of Canadian firms using e-mail. The majority of companies that operated their own website were found by Statistics Canada to be larger enterprises. Among the leading industries that had firms with websites, the information and cultural industry was an unsurprising leader, followed by utilities, professional and educational services.

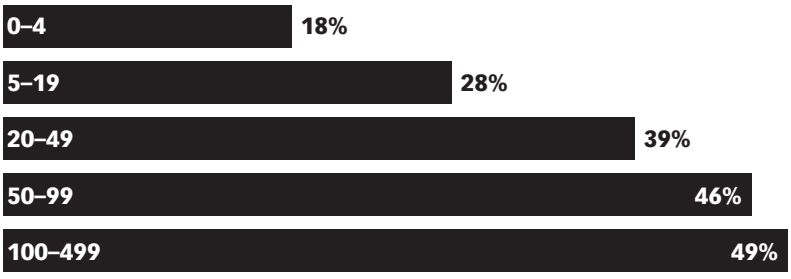
Percent of Canadian Businesses with a Website, 1999 (by selected industries)



Source: Statistics Canada, 2000

The most recent data from the CFIB shows that small and medium-sized businesses are behind larger firms. Once again, there is a clear trend showing that the smaller companies as a group are slower at adopting new internet-related technologies than their larger brethren.

Canadian Small/Medium-Sized Companies with a Website, Q2 2000 (by number of employees)



Source: Canadian Federation of Independent Business (CFIB), 2000

And just as eMarketer has projected within the American economy, a greater proportion of firms are buying versus selling via the internet. Statistics Canada includes retail firms in its estimate of e-commerce activity among Canadian enterprises.

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Canadian Business eCommerce Activity, 1999 (as a % of all enterprises)

Source: Statistics Canada, 2000

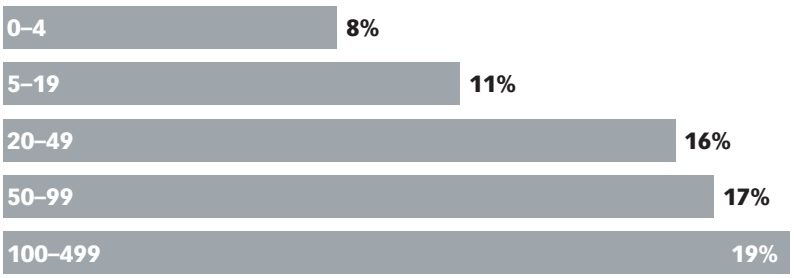
The comparative estimates of IDC are close to those of Statistics Canada.

Percent of Canadian Small/Medium-Sized Companies Selling Online, 1999

Source: International Data Corp. (IDC), 2000

The numbers of the CFIB also confirm the trend, revealing that firms are more likely to buy online, than they are likely to sell via the internet.

Canadian Small/Medium-Sized Companies Selling Online, Q2 2000 (by number of employees)



Source: Canadian Federation of Independent Business (CFIB), 2000

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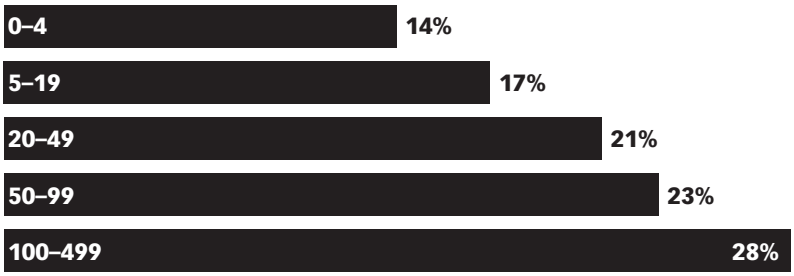
Canadian Small/Medium-Sized Companies Buying Online, Q2 2000 (by number of employees)



Source: Canadian Federation of Independent Business (CFIB), 2000

While there is limited data on activity within the Canadian workforce, the Angus Reid Group estimated that 34% of Canadian adults had at-work internet access in 2000, up from 29% in 1999. This is right in line with Statistics Canada's findings, which put 28% of private sector employees as having internet access in the workplace.

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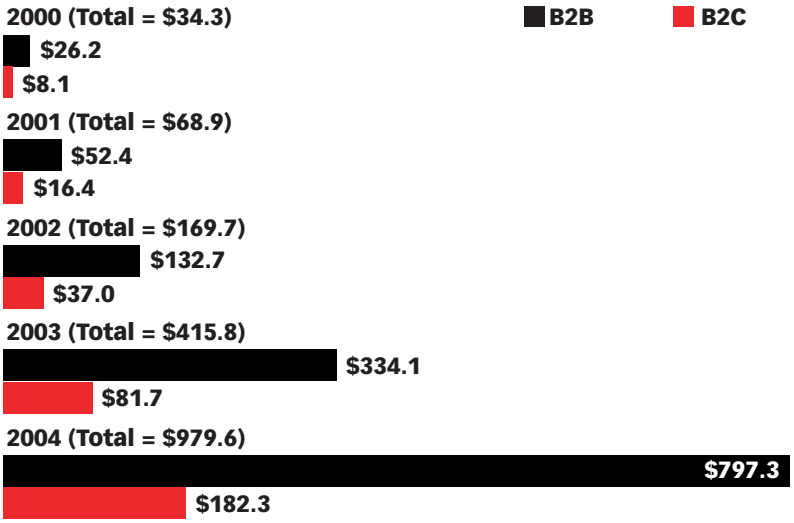
A. Introduction

European e-commerce revenues will grow by a compound annual rate of 132% between 2000 and 2004. This rapid expansion of e-commerce activity depends on increased investment in information technology, steadily increasing internet access, and public policies to make e-business more secure and appealing.

eCommerce in Europe, 2000–2004 (in billions)



Source: eMarketer, 2001

Europe continues to be a poor stepchild to the United States when it comes to e-commerce activity, and will lag behind the US in e-commerce revenue over the next four years. However, the proportion of e-commerce dollars generated in Western Europe compared to the US will rise over the next several years, so that by 2004, Western European e-commerce will equal 61% of the total US e-commerce, and will amount to nearly one-third of the world's e-commerce dollars.

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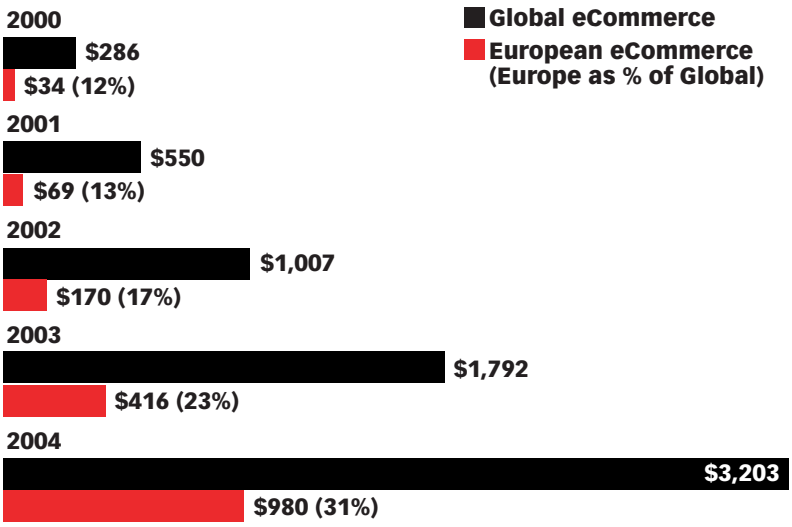
Europe's Share of Global eCommerce Revenues, 2000–2004 (in billions)



Source: eMarketer, 2001

Germany and the UK will remain the European e-commerce powerhouses for at least the next four years, as the following table shows. In fact, the two countries represent more than half of the region's total e-commerce dollars. And, although the Mediterranean countries continue to grow their internet markets, we do not forecast that France, Spain, or Italy will catch up with their northern neighbors over the next four years.

European eCommerce Revenues by Country, 2000–2004 (in billions)

	2000	2001	2002	2003	2004
Denmark	$1.1	$2.3	$5.7	$14.2	$32.0
Finland	$2.0	$4.1	$10.0	$23.8	$53.6
France	$3.6	$7.2	$18.1	$44.9	$109.0
Germany	$9.5	$19.1	$47.9	$118.7	$288.4
Italy	$1.7	$3.4	$7.6	$15.5	$31.0
Netherlands	$2.7	$5.3	$13.3	$33.2	$74.7
Norway	$1.1	$2.2	$5.5	$13.7	$30.8
Poland	$0.2	$0.3	$0.6	$1.3	$2.9
Russia	$0.2	$0.3	$0.6	$1.4	$3.1
Spain	$0.6	$1.3	$2.9	$5.2	$11.8
Sweden	$2.5	$5.0	$12.3	$31.0	$69.7
United Kingdom	$8.8	$17.8	$44.4	$110.1	$267.5
Rest of Region	$0.3	$0.6	$1.1	$2.4	$5.4

Source: eMarketer, 2001

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Poland and Russia remain the internet laggards in the region, with e-commerce revenues in the hundreds of millions. Despite Russia's size and well-educated populace, its economy continues to flounder, and the memory of the 1998 financial crisis, during which ATMs were turned off and Visa cards were rendered useless, continues to make Russians wary of buying, banking, and selling online. And, like Russia, Poland's low GDP and underdeveloped telecommunications infrastructure has hindered e-commerce growth.

European eCommerce Revenues, 2000–2004 (by % share of country)

	2000	2001	2002	2003	2004
Denmark	3.3%	3.3%	3.3%	3.4%	3.3%
Finland	5.9%	5.9%	5.9%	5.7%	5.5%
France	10.4%	10.5%	10.7%	10.8%	11.1%
Germany	27.6%	27.8%	28.2%	28.5%	29.4%
Italy	4.9%	4.9%	4.5%	3.7%	3.2%
Netherlands	7.7%	7.7%	7.8%	8.0%	7.6%
Norway	3.2%	3.2%	3.2%	3.3%	3.1%
Poland	0.6%	0.5%	0.4%	0.3%	0.3%
Russia	0.6%	0.5%	0.4%	0.3%	0.3%
Spain	1.9%	1.9%	1.7%	1.4%	1.2%
Sweden	7.2%	7.2%	7.2%	7.5%	7.1%
United Kingdom	25.6%	25.8%	26.1%	26.5%	27.3%
Rest of Region	1.0%	0.9%	0.7%	0.6%	0.5%
Total	100%	100%	100%	100%	100%

Source: eMarketer, 2001

European eCommerce, 2000 (by % share of country)

	2000
Denmark	3.3%
Finland	5.9%
France	10.4%
Germany	27.6%
Italy	4.9%
Netherlands	7.7%
Norway	3.2%
Poland	0.6%
Russia	0.6%
Spain	1.9%
Sweden	7.2%
United Kingdom	25.6%
Rest of Region	1.0%
Total	100%

Source: eMarketer, 2001

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eCommerce Revenues by Sector, 2000–2004

As the following table indicates, B2B e-commerce continues to represent the lion's share of total e-commerce revenue in each European country we have analyzed.

eCommerce Revenues by Country, 2000–2004 (in billions)

	2000	2001	2002	2003	2004
Denmark					
B2B	$0.8	$1.6	$4.3	$11.2	$25.6
B2C	$0.3	$0.6	$1.4	$3.0	$6.4
Total eCommerce	$1.1	$2.3	$5.7	$14.2	$32.0
Finland					
B2B	$1.6	$3.3	$8.8	$21.4	$49.3
B2C	$0.4	$0.7	$1.2	$2.4	$4.3
Total eCommerce	$2.0	$4.1	$10.0	$23.8	$53.6
France					
B2B	$2.5	$5.4	$13.9	$35.4	$87.2
B2C	$1.1	$1.8	$4.2	$9.4	$21.8
Total eCommerce	$3.6	$7.2	$18.1	$44.9	$109.0
Germany					
B2B	$7.2	$14.4	$36.9	$93.8	$230.7
B2C	$2.3	$4.8	$11.0	$24.9	$57.7
Total eCommerce	$9.5	$19.1	$47.9	$118.7	$288.4
Italy					
B2B	$1.4	$3.0	$6.7	$14.0	$28.2
B2C	$0.3	$0.4	$0.8	$1.6	$2.8
Total eCommerce	$1.7	$3.4	$7.6	$15.5	$31.0
Netherlands					
B2B	$1.9	$3.8	$10.0	$26.2	$59.7
B2C	$0.8	$1.5	$3.3	$7.0	$14.9
Total eCommerce	$2.7	$5.3	$13.3	$33.2	$74.7
Norway					
B2B	$0.8	$1.6	$4.0	$10.8	$25.6
B2C	$0.3	$0.6	$1.5	$2.9	$5.2
Total eCommerce	$1.1	$2.2	$5.5	$13.7	$30.8
Poland					
B2B	$0.2	$0.3	$0.5	$1.2	$2.6
B2C	$0.0	$0.0	$0.1	$0.1	$0.2
Total eCommerce	$0.2	$0.3	$0.6	$1.3	$2.9
Russia					
B2B	$0.2	$0.3	$0.6	$1.2	$2.8
B2C	$0.0	$0.0	$0.1	$0.1	$0.3
Total eCommerce	$0.2	$0.3	$0.6	$1.4	$3.1

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Spain					
B2B	$0.6	$1.1	$2.6	$5.3	$10.8
B2C	$0.1	$0.2	$0.3	$0.6	$1.1
Total eCommerce	$0.6	$1.3	$3.0	$5.9	$11.8
Sweden					
B2B	$1.8	$3.7	$9.4	$24.5	$55.8
B2C	$0.6	$1.2	$2.9	$6.5	$14.0
Total eCommerce	$2.5	$5.0	$12.3	$31.0	$69.7
United Kingdom					
B2B	$7.0	$13.3	$34.2	$87.0	$214.0
B2C	$1.8	$4.4	$10.2	$23.1	$53.5
Total eCommerce	$8.8	$17.8	$44.4	$110.1	$267.5
Rest of Region					
B2B	$0.3	$0.5	$1.0	$2.1	$4.9
B2C	$0.1	$0.1	$0.1	$0.2	$0.4
Total eCommerce	$0.3	$0.6	$1.1	$2.4	$5.4
Total Europe					
B2B	$26.2	$52.4	$132.7	$334.1	$797.3
B2C	$8.1	$16.5	$37.1	$81.8	$182.5
Total eCommerce	$34.3	$68.9	$169.8	$416.0	$979.8

Source: eMarketer, 2001

Comparative Estimates

Forecasting e-commerce activity is made difficult by the lack of longitudinal data on internet use and online buying habits. Uncertainty is only increased by the advent of novel business models and consolidation and failures of dot-com businesses. The range and variability of market estimates become apparent when one compares several side by side, as we do throughout this report.

In computing eMarketer's forecasts of e-commerce revenue we have attempted to normalize data from other research firms, but the comparative figures we publish are unadjusted estimates reported in various reports, articles, and papers. While we have made every effort to compare apples to apples, each research firm employs different economic assumptions, uses different data and methodologies, and covers somewhat different geographical regions.

For example, Forrester Research has made some of the rosiest predictions of e-commerce growth in Europe, forecasting that online revenues will grow at triple-digit rates to reach $1.66 trillion by 2004, from $88 billion in 2000. The Forrester model assumes that e-commerce follows the same path of diffusion as other technologies — an s-shaped curve that approaches a theoretical saturation point for each country.

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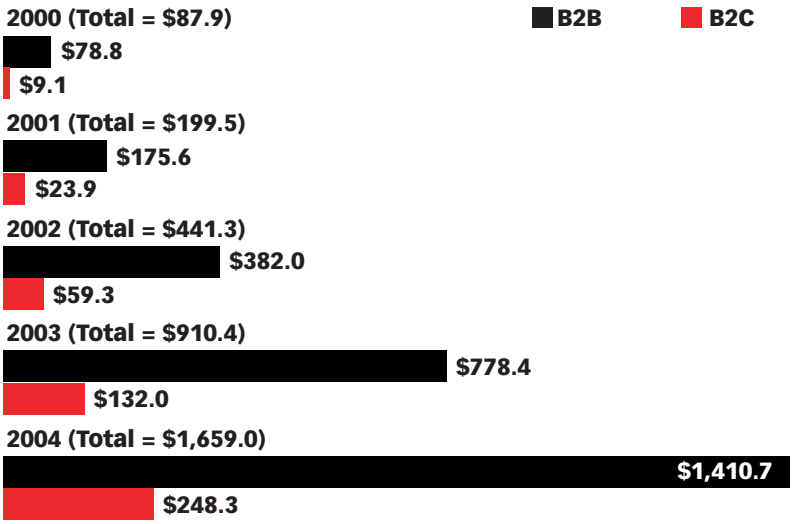
Forrester estimates that adoption of e-commerce occurs rapidly (along the steeply rising part of the s-curve) once the online market in a country reaches 10% of the theoretical saturation level. The data underpinning the Forrester model are derived from interviews with marketing and purchasing business leaders, along with detailed modeling of key industries on a country-by-country basis.

eCommerce Revenues in Europe, 2000–2004 (in billions)



Source: Forrester Research, 1999

At the other end of the spectrum is the International Data Corporation (IDC). IDC's forecasts have tended to be significantly more conservative than Forrester's. In part, this is because IDC relies more heavily on data gathered from online buyers rather than corporate leaders (who may be considered either overly optimistic or particularly insightful). IDC has forecast that total e-commerce for Western Europe will reach $511.1 billion by 2003, a little more than half the size of Forrester's estimate. According to IDC, Western Europe's share of worldwide e-commerce grows from 21.9% in 1999 to 39.3% in 2002, before falling to 34.1% in 2003

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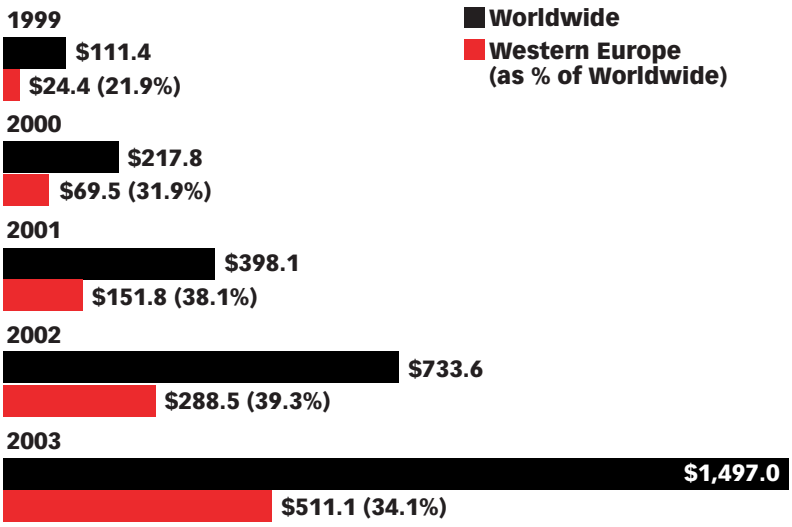
eCommerce Revenues in Europe, 1999–2003 (in billions)



Source: International Data Corp. (IDC), 2000

IDC's year 2000 estimates country-by-country show Germany and the UK as comprising 55% of the region's total e-commerce revenues. Not surprisingly, countries in the Mediterranean region have relatively less developed e-commerce markets.

eCommerce Revenues in Selected W. European Countries, 2000 (in billions)

Country	Billions	% of Total
Germany	$20.9	30%
UK	$17.4	25%
France	$4.9	7%
Italy	$4.9	7%
Netherlands	$4.2	6%
Sweden	$3.5	5%
Austria	$2.1	3%
Spain	$2.1	3%
Switzerland	$2.1	3%
Belgium	$1.4	2%
Denmark	$1.4	2%
Finland	$1.4	2%
Norway	$1.4	2%
Greece	$0.7	1%
Ireland	$0.7	1%
Portugal	$0.7	1%
Total	$69.6	100%

Source: International Data Corp. (IDC), 2000

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Warburg Dillon Read's forecast is close to IDC's. Warburg predicts e-commerce spending in Western Europe will grow from $18.9 billion in 1999 to $223 billion by year-end 2002, figures that are approximately half as large as Forrester's.

eCommerce Revenues by European Country, 2002 (in billions)

Germany	$62.8
UK	$47.6
France	$28.5
Italy	$18.1
Netherlands	$12.6
Sweden	$8.7
Spain	$8.0
Switzerland	$7.8
Austria	$5.8
Denmark	$5.2
Norway	$4.7
Belgium	$4.4
Finland	$3.7
Portugal	$1.8
Ireland	$1.7
Greece	$1.7
Total	$223.0

Source: Warburg Dillon Read, 2000

One of the smallest estimates comes from ProActive International's Pan European Internet Monitor. The ProActive study tracks internet use in 14 countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Norway, Spain, Sweden, Switzerland, the Netherlands, and the United Kingdom. The research relies on a combination of more than 150,000 online surveys – a method that can result in a skewed sample – as well as telephone and face-to-face interviews among a statistically representative sample of 14,500 Europeans who are 15 and older.

eCommerce in Europe, 2000 (in billions)

B2C Purchases in Europe	**$19.0**
B2B Purchases in Europe	**$25.0**
Source: ProActive International, 2000	**Total = $44.0**

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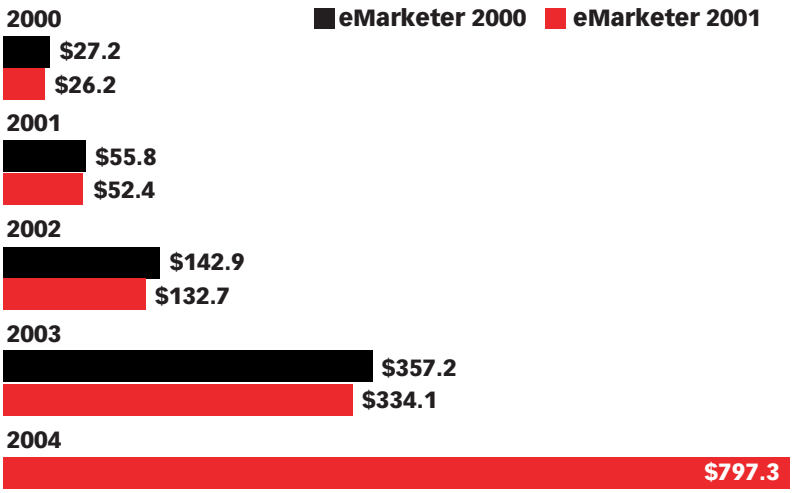
European B2B eCommerce

The B2B sector will grow exponentially over the next four years, from $26 billion in 2000 to $797 billion in 2004. However, based on a revised model, including a tempered estimate of the maturation of vertical marketplaces, our estimated revenues are slightly smaller over the next few years than we projected in the previous eEurope report.

European B2B eCommerce Revenues, 2000–2004 (in billions)



Source: eMarketer, 2001

The majority of e-commerce revenues worldwide come from business to business transactions. Over time, the B2B share of total e-commerce in Europe will increase further, from 77% of total e-commerce in 2000 to 81% in 2004.

B2B Share of Total eCommerce in Region, 2000–2004

Source: eMarketer, 2001

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B2B eCommerce Revenues by Country, 2000–2004

As the following data illustrate, the countries with the largest B2B revenues are Germany, the UK, and France — large economic powerhouses in the region. But there is tremendous potential for growth in the B2B sector throughout Europe. B2B represents 12.5% of GDP on average throughout Europe, according to Durlacher. Germany comes in fifth among nations surveyed by Durlacher, suggesting that its B2B e-commerce has a long way to grow.

B2B eCommerce Revenues by Country, 2000–2004 (in billions)

	2000	2001	2002	2003	2004
Denmark	$0.8	$1.6	$4.3	$11.2	$25.6
Finland	$1.6	$3.3	$8.8	$21.4	$49.3
France	$2.5	$5.4	$13.9	$35.4	$87.2
Germany	$7.2	$14.4	$36.9	$93.8	$230.7
Italy	$1.4	$3.0	$6.7	$14.0	$28.2
Netherlands	$1.9	$3.8	$10.0	$26.2	$59.7
Norway	$0.8	$1.6	$4.0	$10.8	$25.6
Poland	$0.2	$0.3	$0.5	$1.2	$2.6
Russia	$0.2	$0.3	$0.6	$1.2	$2.8
Spain	$0.6	$1.1	$2.6	$5.3	$10.8
Sweden	$1.8	$3.7	$9.4	$24.5	$55.8
United Kingdom	$7.0	$13.3	$34.2	$87.0	$214.0
Rest of Region	$0.3	$0.5	$1.0	$2.1	$4.9

Source: eMarketer, 2001

B2B eCommerce Revenues by Country, 2000 (as a % of total B2B e-commerce in Europe)

Germany	27%
United Kingdom	27%
France	10%
Netherlands	7%
Sweden	7%
Finland	6%
Italy	5%
Denmark	3%
Norway	3%
Spain	2%
Rest of Region	1%
Poland	1%
Russia	1%
Total	100%

Source: eMarketer, 2001

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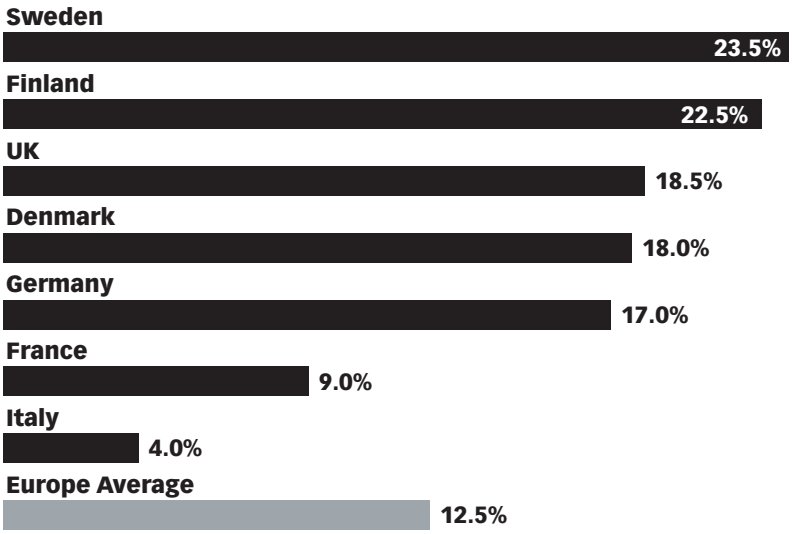
B2B eCommerce by Country (as a % of GDP)



Source: Durlacher Research, 2000

Comparative Estimates of B2B eCommerce

eMarketer's estimates of B2B e-commerce are significantly more conservative than the forecasts of other research firms, as the figure below illustrates. Growth will follow an exponential path, but not ramp up significantly until 2004. As a result, our estimated B2B revenues for 2000 are less than half as large as Forrester's and Durlacher's, and our out-year forecasts are more modest, too. Ecommerce will take several years to diffuse to small and medium-sized enterprises.

Comparative Estimates: B2B eCommerce, 1999–2005 (in billions)

	1999	2000	2001	2002	2003	2004	2005
eMarketer 2001	**–**	**$26.2**	**$52.4**	**$132.7**	**$334.1**	**$797.3**	**–**
Durlacher Research	–	$76.0	$159.0	$366.0	$766.0	$1,272.0	–
Goldman Sachs (EU)	$26.4	$103.9	$227.7	$428.1	$673.5	$1,024.6	$1,516.0
Goldman Sachs (EE)	–	–	$1.4	$5.4	$12.0	$22.6	$35.8
IDC	$15.0	$40.3	–	–	$366.6	–	–
Forrester	–	$78.8	$175.6	$382.0	$778.4	$1,410.7	–

Source: eMarketer, 2001; various, as noted

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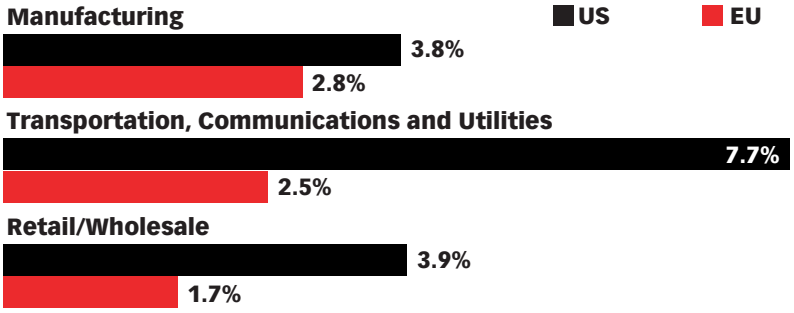
B2B Barriers

Europe's investment in information technology (IT) has been growing at a rate slower than in the US, suggesting that the B2B e-commerce gap between the two regions may in fact widen, not narrow, if European countries do not change course. In the manufacturing sector, for example, IT spending in the US grew 3.8% from 1997 to 1999, but by only 2.8% in the European Union during the same period. The technology gap between Europe and the US will continue to widen unless European investments accelerate even faster. The average US investment in IT as a percentage of GDP was almost double the European level in 1998 (the most recently reported year) according to the European Information Technology Office (EITO). Because per capita GDP is higher in the US than in Europe, the gap in spending between the two regions remains substantial.

Relative IT Spending Growth, 1997–1999



Source: International Data Corp. (IDC); Booz-Allen & Hamilton, 2000

It is more difficult to start a new business in the EU than in the US, a factor which, in addition to the smaller pool of venture capital, has resulted in fewer internet startups in Europe. According to the EU, setting up a business in the US takes an average of ten days and costs approximately $500 in legal fees, compared to 11 weeks and $1,600 in Europe.

Small and medium-sized enterprises (SMEs) have a harder time than larger firms taking advantage of new technologies. Compared to big businesses with large IT budgets and separate marketing divisions, the staff in small and even medium-sized enterprises usually have many other responsibilities besides developing an internet presence.

In March 2000, the Eurobarometer, a regular survey of European attitudes, asked small and medium-sized businesses how they use e-commerce technologies. Of the respondents throughout the region, only 27% had a website with a unique domain name. Nearly one-third had no internet access whatsoever. For the most part, those companies with internet access use it as a research tool, not a selling or procurement technology.

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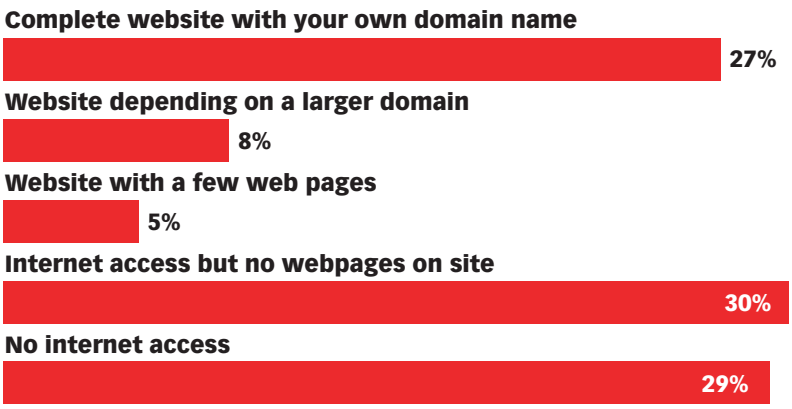
% of Small- and Medium-Sized Businesses with B2B eCommerce Technologies



Source: Flash Eurobarometer 78, March 2000

As expected, Scandinavia came out ahead in terms of the degree to which its small and medium-sized businesses were "e-commerce ready." Spain, France, Italy, and the UK lagged behind.

Ranking of Countries by How eCommerce-Ready Their Small- and Medium-Sized Enterprises Are, 2000

Above Average:	Denmark, Germany, Netherlands, Finland, Sweden
Below Average:	Spain, France, Italy, UK

Source: Flash Eurobarometer 78, March 2000

% of Small- and Medium-Sized Businesses That Use the Internet for the Following Activities, 2000

Researching information on your markets and competition	79%
Advertising/promoting your products/services	51%
Collaborating, from a distance, on a specific project with other companies	44%
Providing after-sales services to your clients	32%
Communicating with local administrations and national authorities	27%
Selling directly to other companies	27%
Managing your company's financial accounts	26%
Selling directly to consumers	26%
Managing orders and invoices with your providers	23%
Allowing staff to work from a distance	22%
Publishing vacancies and recruiting staff	18%
Answering public calls for tender	13%

Source: Flash Eurobarometer 78, March 2000

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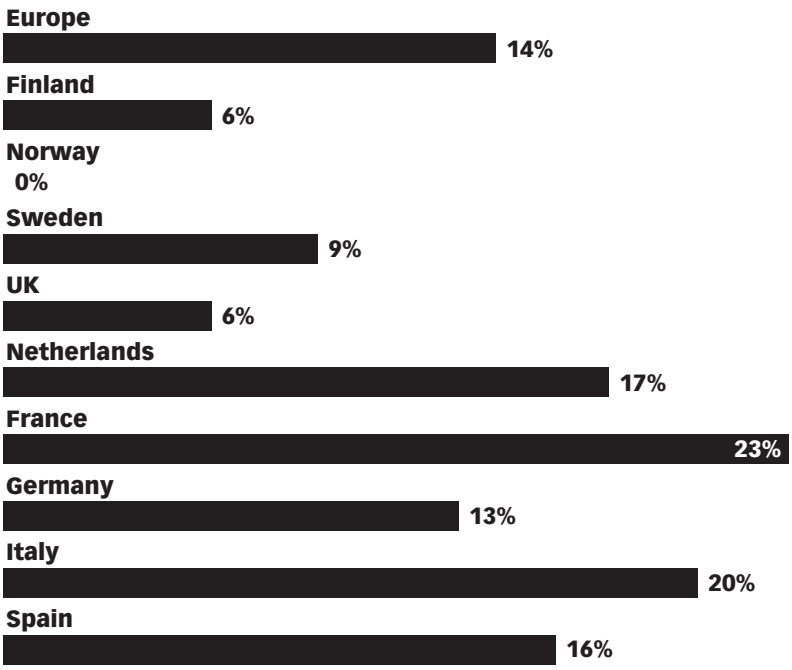
eCommerce has yet to significantly facilitate cross-border sales in Europe. As Andersen Consulting's survey suggests, business leaders are not confident that the internet can help to sell successfully to consumers in countries across Europe.

% of Executives Reporting That eCommerce Enables Sales to Consumers across Europe, 1999



Source: Andersen Consulting, 2000

In Europe, linguistic and cultural differences require companies to make significant investments to tailor their products and websites to individual countries. It is necessary to use local currency on national websites because consumers prefer them to "international" currencies such as the euro or dollar. Payment systems also vary from country to country. Some countries have proprietary credit and debit card systems, others have very low credit card penetration, so international sales require the costly implementation of different payment solutions.

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B2B Drivers

One of the most fundamental precursors to B2B growth is interest in e-commerce among business leaders. In eMarketer's last eGlobal report, we reported that executives in Europe were less enthusiastic about the internet and e-commerce than their counterparts in the US, but this distinction appears to be diminishing, at least according to recent survey research.

Andersen Consulting's survey of Western European executives found that 44% of Western European businesses in 1999 had plans for exploiting e-commerce opportunities in the future, up from 31% in 1998. The European CEOs surveyed generally felt that the internet can lead to greater efficiency and benefit first movers.

Executive Survey: Plans and Attitudes toward eCommerce, 1998–1999

	1998	1999
Plans for exploiting future opportunities in e-commerce	31%	44%
Much more reliant on e-commerce in 5 years time than you are now	50%	59%
Senior management is committed to developing e-commerce	25%	25%
eCommerce enables your company to sell successfully to consumers across Europe	N/A	14%

Source: Andersen Consulting, 2000

Another critical driver is internet penetration in business. For years, tradition-bound European businesses lagged behind the US in computers per employee and internet access. But according to recent research by empirica, approximately two-thirds of European businesses had access to the internet as of the end of 1999.

Mirroring PC and internet penetration patterns generally, firms in Scandinavia and Switzerland are the most wired, while Italy and France lag behind. Not surprisingly, use of the internet is much higher in larger European firms than small enterprises, as the following data indicate.

Proportion of European Businesses Using eMail, Internet, and Intranet, 1999 (by business size)

	0–9 Staff	10–49 Staff	50–199 Staff	200–499 Staff	>500 Staff	All Sizes
Use of eMail	29.9%	53.5%	78.8%	91.9%	96.3%	61.7%
Internet Access	36.6%	60.2%	80.6%	92.9%	95.5%	66.0%
Use of Intranet	9.9%	21.0%	41.5%	47.6%	70.3%	30.6%

Source: empirica, Electronic Commerce and Telework Trends (ECaTT), 2000

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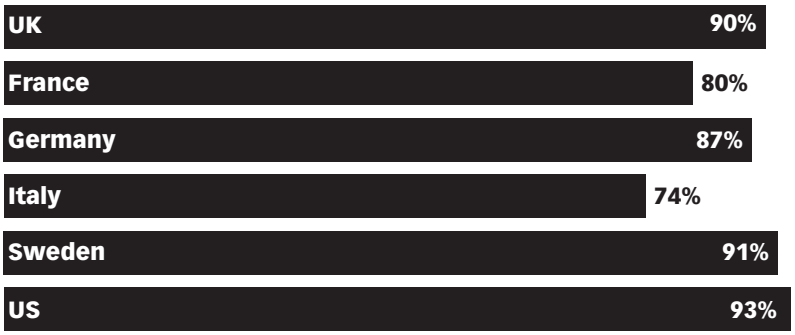
A more recent international survey found internet penetration in businesses to be significantly higher than empirica in five benchmark countries. Firms in the UK, Germany, and Sweden had penetrations nearly as high as the US. However, the Gallup Organization measured significantly lower levels of business internet penetration, as the table below indicates.

% of Businesses with Internet Access, 2000



Source: UK Online, 2000; International Benchmarking Study, 2000

% of Businesses with Websites and Internet Access by Country, 2000

	Site with Own Domain Name	Site Depending on Larger Domain	Site with a Few Webpages	Internet Access Only	Does Not Have Internet Access
Denmark	48%	6%	3%	27%	15%
Germany	37%	11%	6%	30%	15%
Spain	18%	11%	4%	34%	33%
France	21%	6%	5%	27%	41%
Italy	25%	8%	6%	29%	33%
Netherlands.	34%	9%	4%	33%	17%
Finland	19%	27%	2%	28%	22%
Sweden	28%	10%	8%	25%	25%
UK	27%	6%	6%	31%	30%

Source: EOS Gallup Europe, March 2000

While the internet access penetration gap has narrowed, far fewer European businesses have an on-line presence than US businesses, as indicated by the percentage of companies with a website in the US and EU. While the European financial sector is as wired as the US, sectors such as manufacturing and transport lag far behind.

On a positive note, as European businesses actually move on-line, a greater proportion seem to "leapfrog" to using the web for transactions. As the data below show, a larger percentage of businesses with websites in Europe have sites with transactional capacity than businesses with websites in the US.

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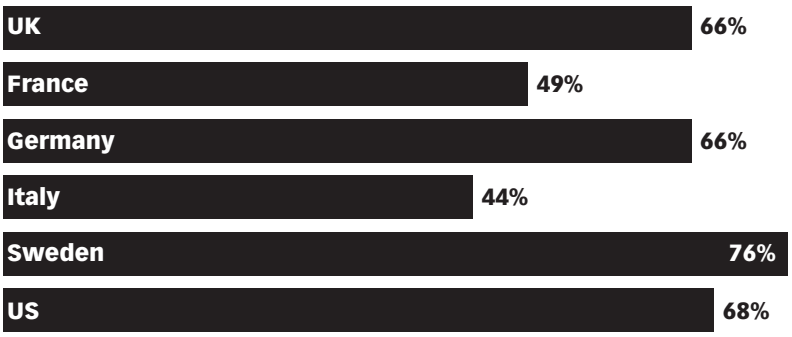
% of Companies with a Website, 1999

Sector	US	EU
Manufacturing	86%	24%
with transactional capacity	16%	2%
Transportation, Communications and Utilities	71%	24%
with transactional capacity	17%	12%
Finance	57%	59%
with transactional capacity	11%	16%

Source: Booz-Allen & Hamilton, 2000

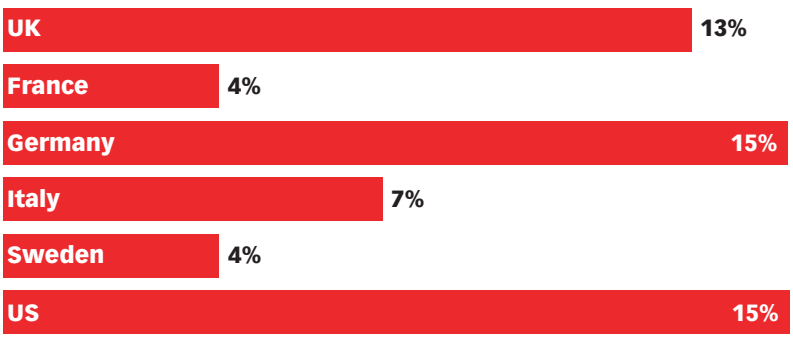
% of Businesses That Have a Marketing Website in Selected Countries, 2000



Source: UK Department of Trade and Industry, 2000

Only a relatively small percentage of firms in five European countries surveyed by UK Online reported that they allow their customers to make payments over the internet. Nevertheless, Germany and the UK seem to be as advanced as businesses in the US in enabling online payments.

% of Businesses That Allow Customers to Make Online Payments, 2000



Source: UK Department of Trade and Industry, 2000

However, even of the firms that allow online ordering, the clear majority have only a small percentage – less than 10% by value – of goods ordered online.

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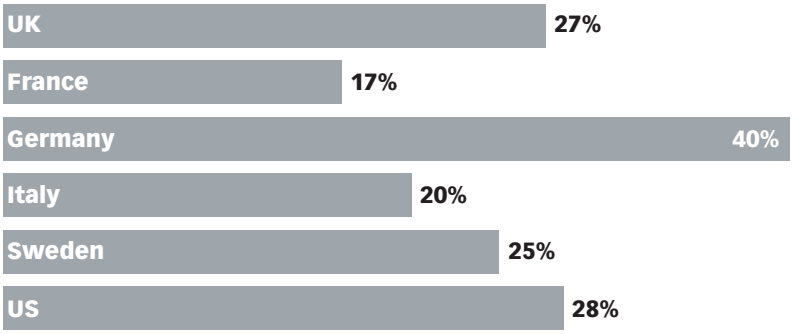
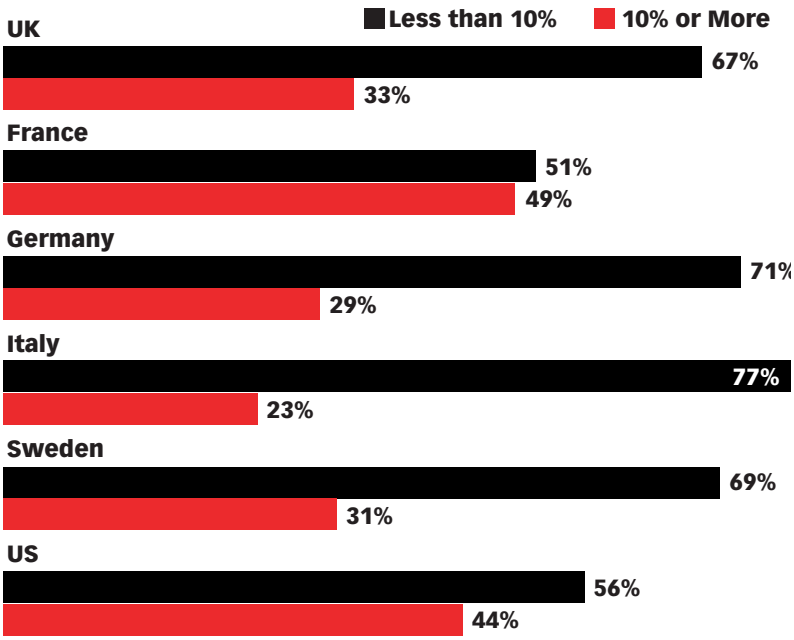
% of Businesses That Allow Customers to Order Online, 2000



Source: UK Department of Trade and Industry, 2000

% of Customer's Purchases Ordered Online (by value of purchases)



Source: UK Department of Trade and Industry, 2000

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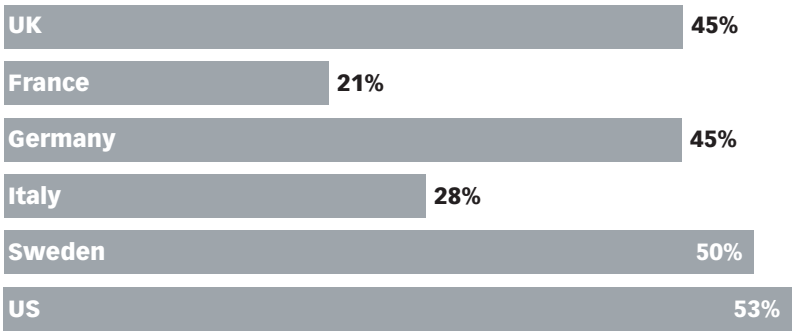
% of Businesses Ordering Supplies Online, 2000



Source: UK Department of Trade and Industry, 2000

Having internet access in a business is important, but enabling workers within the firm to use the internet has at least two important effects. First, the more employees use the web, the easier it is to migrate a variety of internal business transactions online. Second, workplace access helps to diffuse the internet more broadly in a country, as employees who learn to surf at work are likely to seek home internet access. Based on research by Durlacher, the percentage of white- collar workers in Europe who have internet access from work is expected to increase from 50% in 2000 to 70% in 2004.

Access to Internet by White-Collar Workers in Europe, 1999–2004

Year	Total White-Collar Workers (millions)	White-Collar Workers with Internet Access (millions)	Percent
1999	106	42	40%
2000	107	53	50%
2001	108	58.9	55%
2002	109	64.8	59%
2003	109	70.9	65%
2004	110	77	70%

Source: Durlacher Research, 2000, in Collective Wisdom, Europe Profile, 2nd Q 2000

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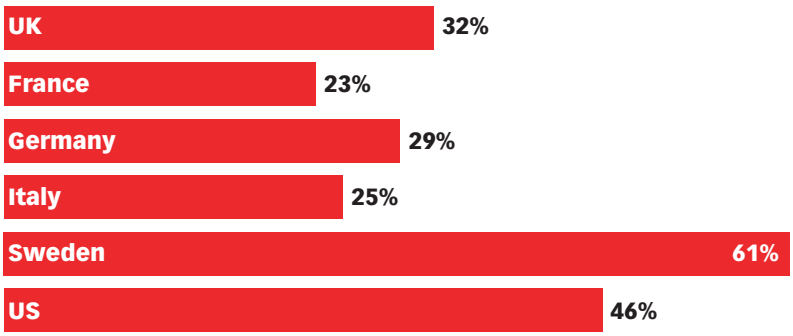
Average % of Employees Using the Internet at Least Monthly



Source: UK Online, 2000; International Benchmarking Study, 2000

Still, for the most part, e-commerce is primarily used as a souped-up form of public relations for the sales and marketing departments, as the following figures from Andersen Consulting's survey indicate. Fewer companies use e-commerce for purchasing, where it can help them procure more efficiently, or in logistics, where enormous efficiencies can be gained. Not surprisingly, mobile commerce applications are far less frequent, though the high percentage of French respondents reporting their use of e-commerce in mobile applications is noteworthy. According to empirica's research, 37% of the European firms they surveyed have websites, yet the vast majority use the web merely for marketing (76%) and information dissemination (79%) but not online sales. Out of all businesses, only 9% sold online as of 1999.

% of Various Business Divisions Using eCommerce in Selected Countries

	Sales and Marketing	Purchasing	Logistics	mCommerce
Finland	83%	47%	33%	13%
France	70%	47%	23%	37%
Germany	75%	50%	38%	19%
Italy	65%	26%	35%	3%
Netherlands	93%	33%	30%	3%
Norway	59%	53%	31%	19%
Poland	84%	28%	28%	6%
Spain	57%	33%	27%	3%
Sweden	77%	57%	23%	13%
UK	74%	61%	45%	13%
USA	80%	52%	34%	6%

Source: Andersen Consulting, 2000

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Business Use of the Internet, 2000

	Denmark	Germany	Spain	France	Italy	Netherlands	Finland	Sweden	UK
Advertising	59%	53%	38%	47%	50%	46%	57%	51%	63%
Selling directly to other cons.	24%	28%	25%	31%	20%	23%	20%	23%	36%
Selling directly to cons.	29%	37%	18%	18%	18%	12%	21%	26%	32%
Distant Collaboration	38%	45%	32%	47%	42%	36%	49%	41%	53%
Providing after-sales svce.	29%	39%	23%	20%	35%	26%	25%	41%	38%
Managing orders/invoicing	27%	16%	32%	20%	25%	20%	35%	31%	26%
Answering public calls	13%	8%	12%	7%	8%	6%	18%	22%	29%
Communications/Admin.	45%	22%	38%	20%	31%	18%	41%	40%	31%
Managing financial accts.	28%	32%	45%	18%	25%	18%	12%	43%	15%
Recruiting	23%	28%	8%	11%	12%	20%	46%	20%	14%
Allowing telecommuting	23%	24%	16%	26%	14%	22%	26%	20%	26%
Researching market info.	69%	87%	76%	71%	85%	79%	75%	77%	75%

Source: European Commission, Flash Eurobarometer, 2000

B. Denmark

QuickStats: Denmark

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	4,411,583	4,420,375	4,431,012	4,443,870	4,459,504
Internet Users	–	1,657,252	1,959,538	2,202,614	2,338,390	2,460,851
Active Internet Users	13.8%	21.1%	35.1%	57.1	66.8%	85.3%
Penetration Rate	–	38%	44%	50%	53%	55%
Total eCommerce (in billions)	–	$1.1	$2.3	$5.7	$14.2	$32.0
B2B	–	$0.8	$1.6	$4.3	$11.2	$25.6
B2C	–	$0.3	$0.6	$1.4	$3.0	$6.4
GDP (billions) PPP (1)	$127.7	–	–	–	–	–
GDP per Capita PPP (1)	$23,800	–	–	–	–	–
PCs/100 (2)	41.4	–	–	–	–	–
Telephone Lines/100 (2)	68.28	–	–	–	–	–
Mobile Phone Lines/100 (2)	49.87	–	–	–	–	–
ISPs (1)	12	–	–	–	–	–
Credit Card Penetration (3)	–	76%	–	–	–	–
Business internet penetration (4)	–	98%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000, data for Scandinavia; (4) Green's Institute, 2000

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B2B eCommerce Revenues in Denmark, 2000–2004 (in billions)

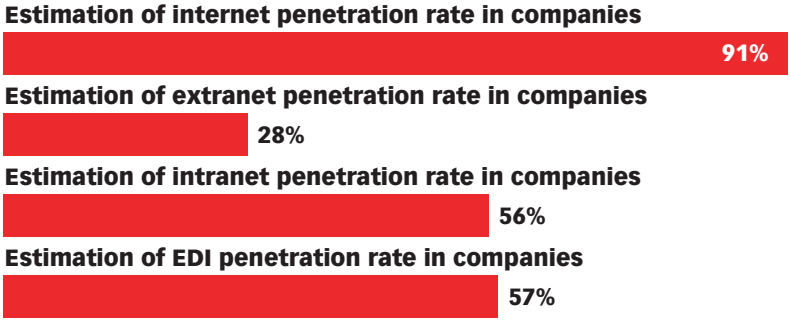
Source: eMarketer, 2000

In contrast to the B2C sector, B2B e-commerce in Denmark will grow from $795 million in 2000 to $25.6 billion in 2004. Many Danish companies are fully computerized, and a recent survey by the Danish Green's Institute shows that 98% of all Danish companies have Internet access (although the European Survey of Information Society (ESIS) pegs the penetration rate at 91%). Approximately 57% of firms use EDI systems.

In countries with fairly extensive government sectors, like Denmark, online government procurement (B2G) is a potentially important market. Danish government procurement of goods and services totaled approximately $14 billion in 1999, and to the extent even a few percent can be moved online, the impact on Danish e-commerce could be significant.

Another area with enormous potential is in financial services. While Europeans, for the most part, have not warmed to electronic banking, most Danish banks offer internet services. In addition, the real estate industry has begun to move online, both advertising homes and providing access to financing and related services online. Tax filing and insurance are also moving to the internet in Denmark.

Business Internet Penetration, Year-End 1999



Source: Danmarks Statistik, 2000

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C. Finland

QuickStats: Finland

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	4,292,777	4,308,372	4,322,764	4,337,905	4,354,006
Internet Users	–	1,904,000	2,252,000	2,531,000	2,687,000	2,828,000
Penetration Rate	–	44%	52%	59%	62%	65%
Total eCommerce (in billions)	–	$2.0	$4.1	$10.0	$23.8	$53.6
B2B	–	$1.6	$3.3	$8.8	$21.4	$49.3
B2C	–	$0.4	$0.7	$1.2	$2.4	$4.3
GDP per Capita PPP (1)	$21,000	–	–	–	–	–
PCs/100 (2)	36.01	–	–	–	–	–
Telephone Lines/100 (2)	55.29	–	–	–	–	–
Mobile Phone Lines/100 (2)	66.7	–	–	–	–	–
ISPs (1)	36	–	–	–	–	–
Credit Card Penetration* (3)	–	76%	–	–	–	–
Business Penetration (4)	–	83%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) Data for Scandinavia, EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

B2B eCommerce Revenues in Finland, 2000–2004 (in billions)

Source: eMarketer, 2000

Finnish B2B e-commerce should grow rapidly. According to a survey by Statistics Finland, 95% of Finnish enterprises with 20 or more employees had Internet access at the end of 1999. Although only 10% of Finnish companies offer their products via the Internet at this time, Statistics Finland found that 52% of Finnish businesses had ordered some goods or services via the Internet. According to the Information Society Promotion Office (ISPO), 36% of Finnish companies used EDI systems. The potential exists for these companies to migrate from EDI systems to the internet.

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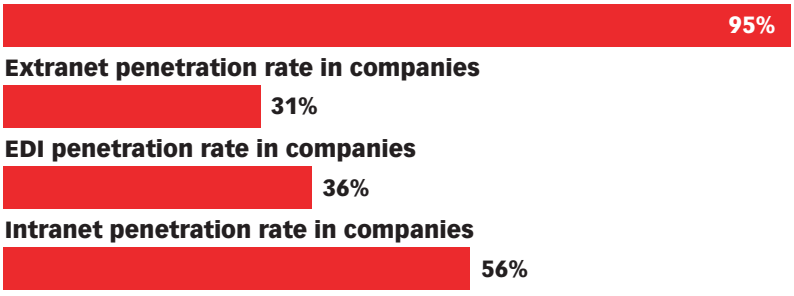
Business Internet Penetration



Source: Danmarks Statistik, 2000

D. France

QuickStats: France

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	48,927,385	49,190,525	49,450,962	49,702,585	49,943,042
Internet Users	–	6,048,000	7,356,000	8,348,000	9,081,000	9,741,000
Penetration Rate	–	12%	15%	17%	18%	20%
Total eCommerce (in billions)	–	$3.6	$7.2	$18.1	$44.9	$109.0
B2B	–	$2.5	$5.4	$14.0	$35.4	$87.2
B2C	–	$1.1	$1.8	$4.2	$9.4	$21.8
GDP (billions) PPP (1)	$1,373	–	–	–	–	–
GDP per Capita PPP (1)	$23,300	–	–	–	–	–
PCs/100 (2)	22.08	–	–	–	–	–
Telephone Lines/100 (2)	57.91	–	–	–	–	–
Mobile Phone Lines/100 (2)	36.4	–	–	–	–	–
ISPs (1)	128	–	–	–	–	–
Credit Card Penetration (3)	–	61%	–	–	–	–
Business Penetration (4)	–	70%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

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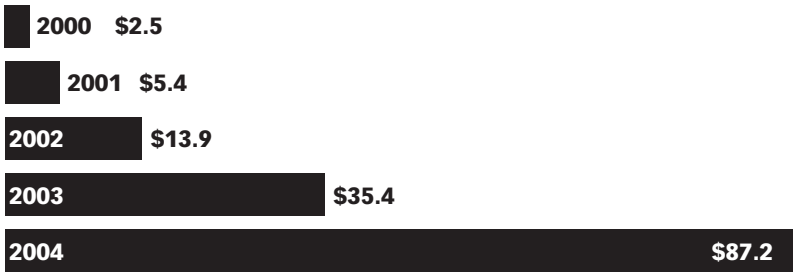
B2B eCommerce Revenues in France, 2000–2004 (in billions)

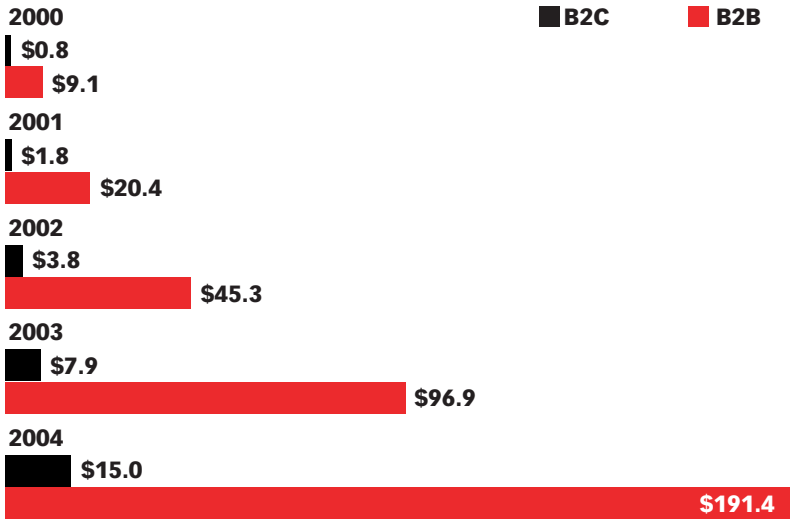


Source: eMarketer, 2000

Total e-commerce in France is expected to increase from $3.6 billion in 2000 to $109 billion in 2004, in large measure due to increasing B2B e-commerce – the lion's share of e-commerce dollars. B2B e-commerce is forecast to increase from $2.5 billion in 2000 to $87 billion in 2004.

But French firms have not adopted e-commerce as voraciously as their Scandinavian counterparts. As of January 2000, there were almost two thousand French businesses selling over the Internet, a 100% increase in one year. However, the percentage of businesses using the internet is 69%, compared to close to 100% internet penetration in some Northern European countries, as the figure below shows.

eCommerce in France, 2000–2004 (in billions)



Source: Forrester Research, 2000

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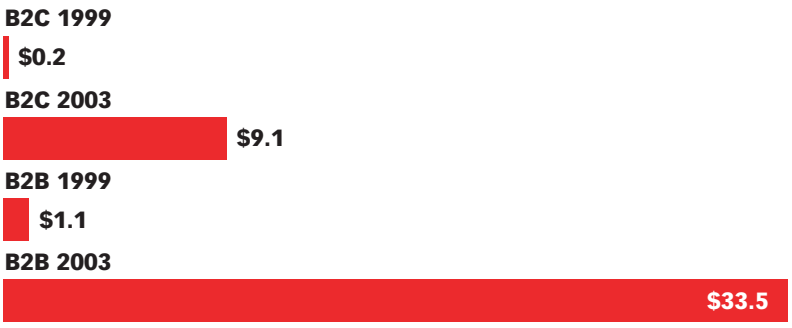
eCommerce in France, 1999 & 2003 (in billions)

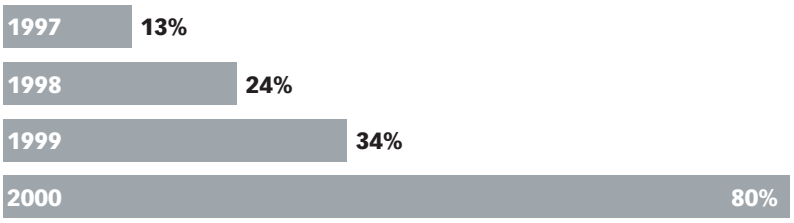


Source: EbusinessEurope.com, 2000

% of French Businesses That Use EDI, 1999–2000

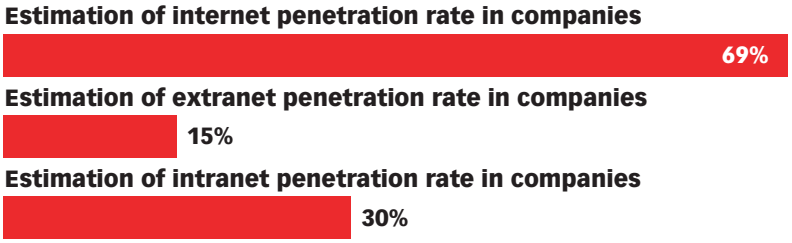
Source: UK Online, 2000; International Benchmarking Study, 2000

% of Businesses with Internet Access in France, 1997–2000



Source: UK online International Benchmarking Study, 2000

Internet Penetration in Businesses, Year-End 1999



Source: Sessi-Enquête TIC, 1999

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E. Germany

QuickStats: Germany

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	70,741,735	71,066,435	71,406,403	71,763,624	72,117,352
Internet Users	–	15,051,000	18,082,000	20,845,000	23,280,000	25,475,000
Penetration Rate	–	21%	25%	29%	32%	35%
Total eCommerce (in billions)	–	$9.5	$19.1	$47.9	$118.7	$288.4
B2B	–	$7.2	$14.4	$36.9	$93.8	$230.7
B2C	–	$2.3	$4.8	$11.0	$24.9	$57.7
GDP (billions) PPP (1)	$1,864	–	–	–	–	–
GDP per Capita PPP (1)	$22,700	–	–	–	–	–
PCs/100 (2)	29.69	–	–	–	–	–
Telephone Lines/100 (2)	58.78	–	–	–	–	–
Mobile Phone Lines/100 (2)	28.56	–	–	–	–	–
ISPs (1)	625	–	–	–	–	–
Credit Card Penetration (3)	–	64%	–	–	–	–
Business Penetration (4)	–	75%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

B2B eCommerce Revenues in Germany, 2000–2004 (in billions)

Source: eMarketer, 2000

B2B e-commerce is growing very rapidly in Germany. In 2000, total B2B revenues will equal $7.2, growing to approximately $231 billion by 2004.

Although only an estimated 69% of German businesses use the internet, according to the Internet Society Promotion Office, a number of very large German firms from diverse industries are adopting e-commerce solutions. For example, chemical firms BASF, Henkel, Degussa-Hüls, and Metallgesellschaft have created an alliance to jointly trade online in raw materials, plastics, and commodity chemicals. In the food industry, Germany's Metro has joined with GNX to take bids via the internet.

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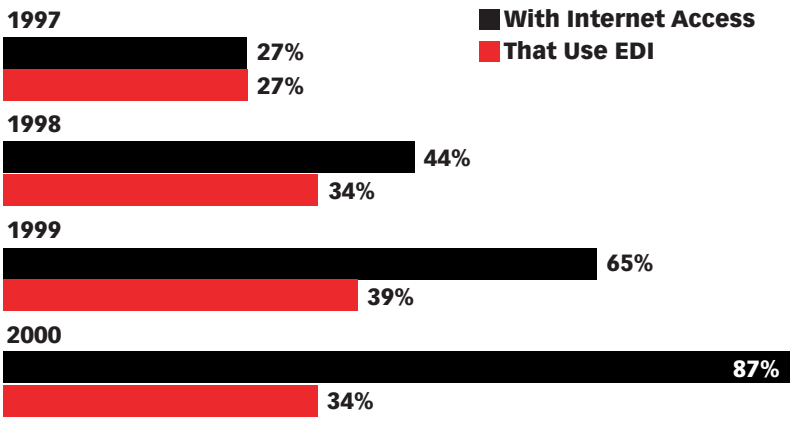
% of Businesses in Germany with Internet or EDI (1997–2000)



Source: UK online International Benchmarking Study, 2000

F. Italy

QuickStats: Italy

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	49,993,663	50,064,792	50,124,788	50,191,447	50,251,003
Internet Users	–	5,438,000	5,980,000	6,425,000	6,766,000	7,011,000
Penetration Rate	–	11%	12%	13%	13%	14%
Total eCommerce (in billions)	–	$1.7	$3.4	$7.6	$15.5	$31.0
B2B	–	$1.4	$3.0	$6.7	$13.9	$28.2
B2C	–	$0.3	$0.4	$0.8	$1.5	$2.8
GDP (billions) PPP	$1,212	–	–	–	–	–
GDP per Capita PPP (1)	$21,400	–	–	–	–	–
PCs/100 (2)	19.18	–	–	–	–	–
Telephone Lines/100 (2)	46.22	–	–	–	–	–
Mobile Phone Lines/100 (2)	52.83	–	–	–	–	–
ISPs (1)	219	–	–	–	–	–
Credit Card Penetration (3)	15%	–	–	–	–	–
Business Penetration (4)	–	65%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

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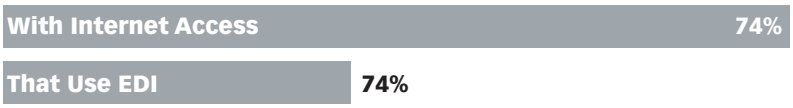
B2B eCommerce Revenues in Italy, 2000–2004 (in billions)

Source: eMarketer, 2000

Only 1.5 million Italian businesses were estimated to be connected to the internet at the end of 1998 — out of a total of 3.4 million businesses nationwide. Recent market surveys from Spectrum ICT indicate that 87% of Italian companies are now connected to the Internet (though Andersen Consulting estimates a 65% penetration rate).

% of Businesses in Italy with Internet or EDI, 2000



Source: UK Department of Trade and Industry, 2000

As a result of this high level of internet penetration in businesses, virtually all major Italian industrial groups are developing e-commerce solutions, and ISPO forecasts that by 2004 at least half of all company purchases will be via the internet. For example, automotive manufacturer Fiat has made major investments in Fast Buyer — an e-procurement company formed jointly with General Motors — and it is also discussing joining the mega-portal Covisint, together with GM, Ford, and Daimler-Chrysler. Other major cases of B2B e-commerce include the tire manufacturer Pirelli, which will be part of the marketplace RubberNetwork.com together with five other major international tire manufacturers.

Comparative Estimates: eCommerce in Italy, 2000–2004 (in billions)

		2000	2001	2002	2003	2004
eMarketer	**B2B**	**$1.4**	**$3.0**	**$6.7**	**$13.9**	**$28.2**
	B2C	**$0.3**	**$0.4**	**$0.8**	**$1.5**	**$2.8**
Computer Economics	B2B	$94.9	$189.7	$237.1	$334.4	
Forrester Research	B2B	$6.7	$14.6	$31.6	$67.0	$134.0
Forrester Research	B2C	$0.5	$1.1	$2.2	$4.4	$8.4

Source: eMarketer, 2000; various, as noted

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eCommerce in Italy, 1999 & 2003 (in billions)

Source: EbusinessEurope.com, 2000

G. The Netherlands

QuickStats: Netherlands

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	13,156,508	13,240,041	13,326,720	13,413,483	13,500,498
Internet Users	–	4,036,000	4,438,000	4,768,000	5,022,000	5,203,000
Penetration Rate	–	31%	34%	36%	37%	39%
Total eCommerce (in billions)	–	$2.7	$5.3	$13.3	$33.1	$74.7
B2B	–	$1.9	$3.8	$10.0	$26.2	$59.7
B2C	–	$0.8	$1.5	$3.3	$7.0	$14.9
GDP (billions) PPP (1)	$365	–	–	–	–	–
GDP per Capita PPP (1)	$23,100	–	–	–	–	–
PCs/100 (2)	35.97	–	–	–	–	–
Telephone Lines/100 (2)	60.64	–	–	–	–	–
Mobile Phone Lines/100 (2)	43.54	–	–	–	–	–
ISPs (1)	70	–	–	–	–	–
Credit Card Penetration	na	–	–	–	–	–
Business Penetration (3)	–	93%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) Andersen Consulting, 2000

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B2B eCommerce Revenues in the Netherlands, 2000–2004 (in billions)

Source: eMarketer, 2000

Recent reports by the Economist Intelligence Unit (EIU) rank the Netherlands fifth – after the U.S. and Scandinavian countries – on the list of countries offering a good business environment and infrastructure for e-commerce. Approximately two-thirds of companies had internet access by the end of 1999, according to Gartner Group, and 93% by 2000, according to Andersen Consulting. About one-third of Dutch companies are engaged in e-commerce. eCommerce revenues in the country are expected to grow from $2.7 billion in 2000 to $75 billion in 2004.

Comparative estimates: B2B revenues in the Netherlands, 2000–2004 (in billions)

		2000	2001	2002	2003	2004
eMarketer	**B2B**	**$1.9**	**$3.8**	**$10.0**	**$26.2**	**$59.7**
	B2C	**$0.8**	**$1.5**	**$3.3**	**$7.0**	**$14.9**
Computer Economics	B2B	$31.0	$62.0	$77.5	$109.2	
Forrester Research	B2B	$6.0	$13.4	$28.6	$55.7	$92.7

Source: eMarketer, 2000; various, as noted

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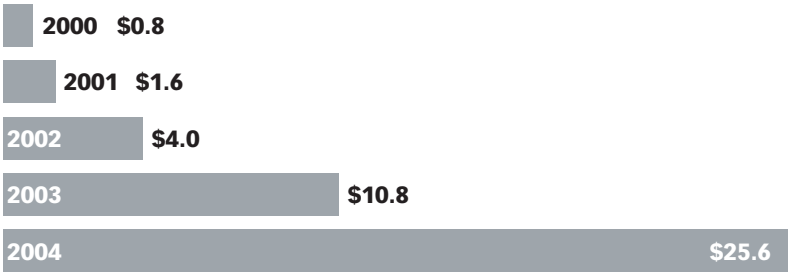
H. Norway

QuickStats: Norway

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	3,644,377	3,662,747	3,682,220	3,703,628	3,727,253
Internet Users	–	1,645,000	1,945,000	2,186,000	2,321,000	2,442,000
Penetration Rate	–	45%	53%	59%	63%	66%
Total eCommerce (in billions)	–	$1.1	$2.2	$5.5	$13.7	$30.8
B2B	–	$0.8	$1.6	$4.0	$10.8	$25.6
B2C	–	$0.3	$0.6	$1.5	$2.9	$5.2
GDP (billions) PPP (1)	$111	–	–	–	–	–
GDP per Capita PPP (1)	$25,100	–	–	–	–	–
PCs/100 (2)	44.99	–	–	–	–	–
Telephone Lines/100 (2)	71.2	–	–	–	–	–
Mobile Phone Lines/100 (2)	61.75	–	–	–	–	–
ISPs (1)	21	–	–	–	–	–
Credit Card Penetration* (3)	–	76%	–	–	–	–
Business Penetration (4)	–	59%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) Data for Scandinavia, EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

B2B eCommerce Revenues in Norway, 2000–2004 (in billions)



Source: eMarketer, 2000

A survey carried out in 2000 by the Norwegian Statistics Bureau showed that 10% of companies with more than ten employees generated sales from e-commerce in 1999. The proportion of e-commerce revenue to total revenue was quite low, however: less than 10% percent for 69% percent of the companies. Only 8% obtained 25% or more of their sales from e-commerce.

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B2B e-commerce might be stimulated by online ventures designed to facilitate trade in the oil industry. As the second largest largest oil exporting nation, Norway's market for equipment and services is estimated to be $9-12 billion. One e-marketplace, called the Achilles system, helps to identify qualified suppliers and facilitate procurement for oil ventures. The largest Norwegian oil company, Statoil, however, has decided to invest $4.5 million to develop a more integrated e-marketplace called Trade Ranger. Through this system, Statoil expects to cut costs by 2-5 percent on procurement.

Government procurement is another avenue to stimulate online business in Norway. The Norwegian government has initiated a program to establish an electronic market place for the government to procure goods and services online, as well as for companies wishing to do business with the government an easier way to submit bids.

Comparative Estimates: B2B eCommerce Revenues in Norway, 2000–2004 (in billions)

B2B	2000	2001	2002	2003	2004
eMarketer					
Computer Economics	$11.8	$23.6	$29.5	$41.7	
Forrester Research	$2.7	$6.1	$13.0	$24.4	$38.1

Source: eMarketer, 2000; various, as noted

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I. Poland

QuickStats: Poland

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	31,862,558	32,081,060	32,264,043	32,403,812	32,534,439
Internet Users	–	1,6000,000	2,100,000	2,500,000	3,000,000	3,400,000
Penetration Rate	–	5%	6%	8%	9%	10%
Total eCommerce (in billions)	–	$0.2	$0.3	$0.6	$1.2	$2.8
B2B	–	$0.2	$0.3	$0.5	$1.1	$2.6
B2C	–	$0.0	$0.0	$0.1	$0.1	$0.2
GDP (billions) PPP (1)	$277	–	–	–	–	–
GDP per Capita PPP (1)	$7,200	–	–	–	–	–
PCs/100 (2)	6.2	–	–	–	–	–
Telephone Lines/100 (2)	25.99	–	–	–	–	–
Mobile Phone Lines/100 (2)	10.21	–	–	–	–	–
ISPs (1)	161	–	–	–	–	–
Credit Card Penetration (3)	–	28%	–	–	–	–
Business Penetration (4)	–	84%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) Polish Embassy, July 2000; (4) Andersen Consulting, 2000

eCommerce in Poland is still in its formative stages. An inadequate legal environment, such as a lack of regulations governing electronic signatures, as well as delayed liberalization of the telecommunications services market and high internet costs are significant obstacles to the development of Polish e-commerce. In addition, consumers' limited experience in buying from catalogs and "remote-buying" are additional barriers.

Nevertheless, the internet is an increasingly important part of the Polish economy. According to one study as much as 6% of Polish GDP may be generated by IT and internet-related companies. For 2000, the value of the e-commerce market in Poland is estimated to be $202 million.

B2B eCommerce Revenues in Poland, 2000–2004 (in billions)

Source: eMarketer, 2000

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B2B e-commerce accounts for the largest part of e-commerce in Poland, at $182 million. Only 40% of Polish companies have internet access, according to ISPO, and only about 400 companies are actively selling through the internet. Inadequate infrastructure and limited access to high-speed connections are a major hindrance.

J. Russia

QuickStats: Russia

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	121,903,995	122,412,822	122,912,753	123,302,986	123,548,646
Internet Users	–	2,900,000	3,800,000	5,000,000	6,400,000	7,900,000
Penetration Rate	–	2%	3%	4%	5%	6%
Total eCommerce (in billions)	–	$0.2	$0.3	$0.6	$1.3	$3.1
B2B	–	$0.2	$0.3	$0.6	$1.2	$2.8
B2C	–	$0.0	$0.0	$0.0	$0.1	$0.3
GDP (billions) PPP (1)	$620	–	–	–	–	–
GDP per Capita PPP (1)	$4,200	–	–	–	–	–
PCs/100 (2)	3.74	–	–	–	–	–
Telephone Lines/100 (2)	19.71	–	–	–	–	–
Mobile Phone Lines/100 (2)	0.92	–	–	–	–	–
ISPs (1)	83	–	–	–	–	–
Credit Card Penetration (3)	5.3%	–	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000

B2B eCommerce Revenues in Russia, 2000–2004 (in billions)

Source: eMarketer, 2000

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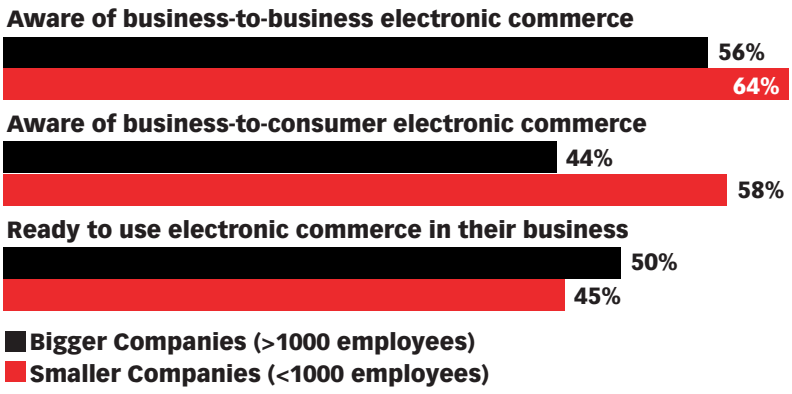
Large Russian corporations are investing in B2B e-commerce solutions, particularly in basic industries like mining, metallurgy, and oil drilling and refining. Companies are trying to integrate their business processes online and to market commodities globally through the internet. For example, Surgutneftegas oil company is planning to build a site for corporate purchases. Oil pipeline monopoly Sibneft, Transneft, the Ministry of Railways, and Transtelecom announced the formation of the Energy Trading System, a $100 million project to establish an electronic commodity exchange for oil, petroleum products, electricity, and natural gas.

eCommerce Penetration in Russian Businesses



Source: The Algorithm Group, November 1999

Internet sites to trade commodities, including steel, metals, oil products, and grain have been developed, such as Zerno Online (grain), Oil Online, Europe-Steel.com, Emetex (metals), and Business.ru.

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K. Spain

QuickStats: Spain

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	34,500,688	34,596,076	34,676,804	34,743,186	34,795,356
Internet Users	–	2,582,000	3,053,000	3,431,000	3,643,000	3,834,000
Penetration Rate	–	7%	9%	10%	10%	11%
Total eCommerce (in billions)	–	$0.6	$1.3	$2.9	$5.9	$11.8
B2B	–	$0.5	$1.1	$2.6	$5.3	$10.8
B2C	–	$0.1	$0.2	$0.3	$0.6	$1.1
GDP (billions) PPP (1)	$678	–	–	–	–	–
GDP per Capita PPP (1)	$17,300	–	–	–	–	–
PCs/100 (2)	12.18	–	–	–	–	–
Telephone Lines/100 (2)	41.81	–	–	–	–	–
Mobile Phone Lines/100 (2)	31.2	–	–	–	–	–
ISPs (1)	49	–	–	–	–	–
Credit Card Penetration (3)	–	18%	–	–	–	–
Business Penetration (4)	–	57%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

B2B eCommerce Revenues in Spain, 2000–2004 (in billions)

Source: eMarketer, 2000

One of the barriers to e-commerce diffusion in Spain is the preponderance of small and medium-sized businesses in Spain. Only 0.1% of all Spanish companies are considered very large firms; most are the kinds of firms that have the hardest time switching business practices, financing new technologies, and supporting e-commerce platforms. As a result, the internet penetration rate in companies is only 47%, according to ISPO.

Traditional companies such as Endesa (utility), FCC (construction, environment), Dragados (construction), Telefonica (telecommunications), Sol Melia (tourism) and Campofrio (food), not to mention the leading banks, are investing heavily in B2B platforms.

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B2C Commerce in Spain, 1998–2005 (in billions)

Source: Spanish eCommerce Association (AECE, 2000)

L. Sweden

QuickStats: Sweden

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	7,355,861	7,379,271	7,405,066	7,434,211	7,466,741
Internet Users	–	3,924,000	4,315,000	4,636,000	4,883,000	5,059,000
Penetration Rate	–	53%	58%	63%	66%	68%
Total eCommerce (in billions)	–	$2.5	$5.0	$12.4	$31.0	$69.7
B2B	–	$1.8	$3.7	$9.4	$24.5	$55.8
B2C	–	$0.6	$1.2	$2.9	$6.5	$13.9
GDP (billions) PPP (1)	$184	–	–	–	–	–
GDP per Capita PPP (1)	$20,700	–	–	–	–	–
PCs/100 (2)	45.14	–	–	–	–	–
Telephone Lines/100 (2)	66.46	–	–	–	–	–
Mobile Phone Lines/100 (2)	57.83	–	–	–	–	–
ISPs (1)	29	–	–	–	–	–
Credit Card Penetration* (3)	–	76%	–	–	–	–
Business Penetration (4)	–	77%	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) Data for Scandinavia EbusinessEurope.com, 2000; (4) Andersen Consulting, 2000

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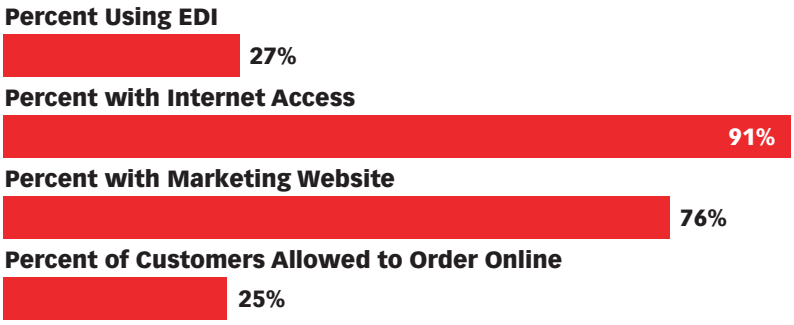
B2B eCommerce Revenues in Sweden, 2000–2004 (in billions)

Source: eMarketer, 2000

In Sweden, large numbers of manufacturers and distributors are engaged in B2B e-commerce, resulting in B2B revenues of $1.8 billion in 2000. This is the sector of Sweden's internet economy with the largest potential for growth. However, with only a 75% internet penetration rate for businesses, according to ISPO (77% according to Andersen Consulting), there is much room for growth.

Business Internet Penetration in Sweden, 2000



Source: UK online, 2000

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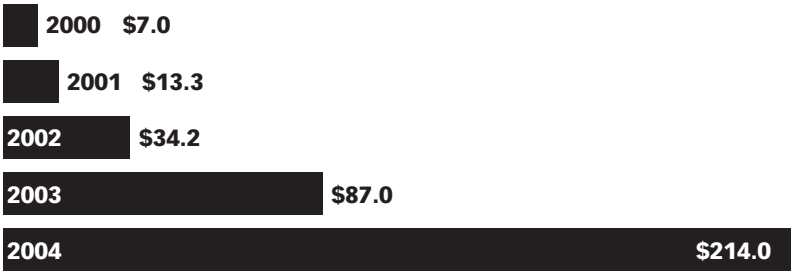
M. The United Kingdom

QuickStats: UK

	1999	2000	2001	2002	2003	2004
Adult (14+) Population	–	48,955,510	49,170,155	49,391,538	49,623,427	49,851,457
Internet Users	–	16,125,000	19,067,000	21,432,000	22,753,000	23,944,000
Penetration Rate	–	33%	39%	43%	46%	48%
Total eCommerce (in billions)	–	$8.8	$17.8	$44.4	$110.1	$267.5
B2B	–	$7.0	$13.3	$34.2	$87.0	$214.0
B2C	–	$1.8	$4.4	$10.2	$23.1	$53.5
GDP (billions) PPP (1)	$1,290	1999	–	–	–	–
GDP per Capita PPP (1)	$21,800	1999	–	–	–	–
PCs/100 (2)	30.64	1999	–	–	–	–
Telephone Lines/100 (2)	55.69	1999	–	–	–	–
Mobile Phone Lines/100 (2)	40.76	1999	–	–	–	–
ISPs (1)	364	1999	–	–	–	–
Credit Card Penetration (3)	77%	1999	–	–	–	–
Business Penetration (4)	74%	2000	–	–	–	–

Sources: eMarketer; (1) CIA World Fact Book, 2000; (2) ITU Telecommunications Indicators, 2000; (3) EbusinessEurope.com, 2000; (4) Andersen Consulting

B2B eCommerce Revenues in the UK, 2000–2004 (in billions)



Source: eMarketer, 2000

Business-to-business e-commerce is expanding rapidly in the UK. While 62% of UK companies have internet access, according to research by Spectrum (and 74% according to Andersen Consulting), a recent survey found that over 55% of UK firms planned to implement e-procurement mechanisms by the end of 2000.

Leading European multinationals like UK-based BP plan to switch most of their purchasing on-line. BP will soon buy $4 billion worth of supplies and equipment annually, according to CEO John Browne. The company plans to conduct as much as 95% of its purchases through e-procurement systems.

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According to a survey conducted by MORI, however, European companies are still conducting the majority of their transactions offline. Not surprisingly, larger companies are more likely to be using EDI for transactions – on average companies with over 3,000 employees conduct 18% of their transactions via EDI while those with 250-499 employees conduct only 6%.

MORI found that the majority of companies using the web for B2B transactions are actually conducting few transactions by this method, with one-third to one-half conducting fewer than 50 per month. Moreover, of those transactions being conducted, many are of a low value, particularly in retail and public sector. According to the study, security is less of an obstacle to B2B e-commerce than budget constraints, the lack of adequate information technology integration, and the limited use of the technology by suppliers and partners.

For businesses, the government has introduced schemes to encourage small and medium-sized enterprises to use IT, including tax breaks to cover equipment purchases and loan schemes to encourage employees to use PCs at home. Additional government services made available online include filing tax returns (encouraged by discounts for electronic filing and payment); small business services (tailored advice based on company size, location and sector); employment services (job vacancies on-line); and VAT registration, declarations and other returns to HM Customs and Excise.

The growth in industry-sponsored business-to-business exchanges is also accelerating. The automotive, airline, chemicals, and textile industries are expected to have exchanges up and running by 2001. On-line market specialists Ariba and Commerce One are extremely active in the UK and media interest in the field is intense. Earlier this year, the supermarket chain Sainsbury made headlines when it announced that it had sourced its entire quarterly supply of cheddar cheese using an internet auction.

Comparative Estimates: eCommerce in the UK, 2000–2004 (in billions)

		2000	2001	2002	2003	2004
eMarketer	**B2B**	**$7.0**	**$13.3**	**$34.2**	**$87.0**	**$214.0**
	B2C	**$1.8**	**$4.4**	**$10.2**	**$23.1**	**$53.5**
Computer Economics	B2B	$0.1	$0.2	$0.3	$0.4	–
Forrester Research	B2B	$ 0.0	$0.0	$0.1	$0.2	$0.3

Source: eMarketer, 2000; various, as noted

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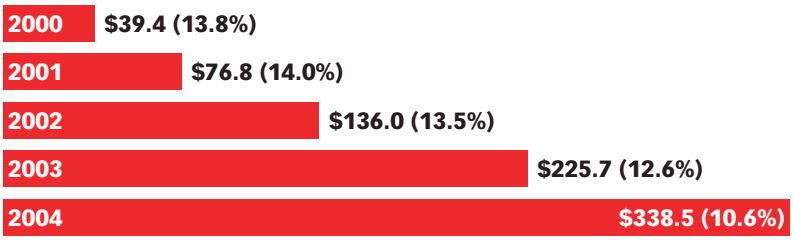
A. Introduction

The Asia Pacific region's e-commerce revenues have grown dramatically over the past year. In our last eAsia report, we forecast e-commerce revenues for the region to grow from $15.4 billion in 2000 to $88.0 billion by 2003. Based on new data available, eMarketer has revised its estimates upward: eMarketer now projects that revenues reached approximately $39.4 billion by the year 2000. This figure will continue to climb higher, reaching more than $338 billion by the end of 2004.

Even though total Asian e-commerce revenues will increase substantially over the next few years, the region as a whole still accounts for only a fraction of the total revenues on a worldwide basis. eMarketer expects total Asian e-commerce as a percentage of the world will peak at 14% by 2001, but will shrink to 10.6% by the end of 2004.

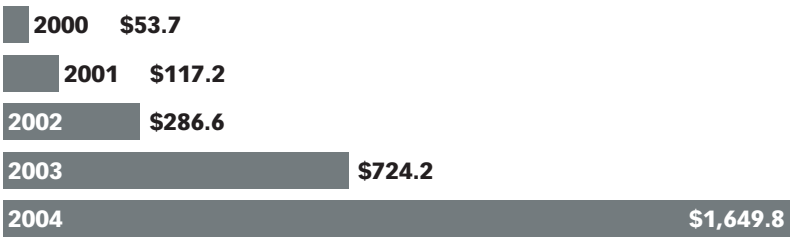
B. Overview

eCommerce Revenues in Asia, 2000–2004 (in billions and as % of worldwide)



Source: eMarketer, 2001

eCommerce Revenues in Asia, 2000–2004 (in billions)



Source: Forrester Research, 2000

In addition, Lehman Brothers estimates Asian B2B e-commerce reached $69.7 billion in 2000.

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B2B eCommerce

The Asian e-commerce landscape is far from evenly distributed. Japan, the world's second biggest economy, is responsible for more than $27 billion of online revenues within the region, or approximately 70% of the total. Even as other countries race to build their online presence, Japan will maintain its regional dominance in the near future.

"B2B is the biggest market that will emerge in the next three years."

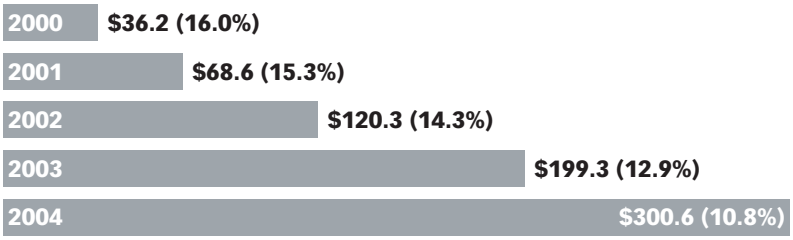
— Edward Zeng, Founder and CEO, Sparkice

Given the region's strong economic recovery and advanced manufacturing sector, eMarketer expects B2B e-commerce to generate the bulk of its online revenues for the foreseeable future. External factors such as low household internet connectivity and limited disposable incomes among potential internet users in the region will continue to hamper the B2C segment.

The B2B segment is changing the way Asian manufacturers trade with the rest of the world. It will shorten supply chains, allow small and medium-sized manufacturers to find new buyers and boost productivity.

Asian B2B revenues grew to more than $36 billion in the year 2000. B2B e-commerce revenues will continue to climb to more than $300 billion by 2004. Comparative estimates with other leading research firms, meanwhile, put eMarketer's numbers at the lower end of the scale. Both big-name companies and obscure startups are jumping into the B2B market with both feet. According to IDC, Asia's B2B sector should grow more than tenfold to $330 billion by 2004, as it accounts for 70% of the region's e-commerce.

B2B eCommerce Revenues in Asia, 2000–2004 (in billions and as % of worldwide)



Source: eMarketer, 2001

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Comparative Estimates: B2B eCommerce Revenues in Asia, 2000–2004 (in billions and as % of worldwide)

	2000	2001	2002	2003	2004
eMarketer	**$36.2**	**$68.6**	**$120.3**	**$199.3**	**$300.6**
Computer Economics	$758.8	$1,134.9	$1,423.6	$2,095.1	–
Forrester Research	$49.9	$108.9	$266.3	$672.8	$1,532.7
Goldman Sachs	$8.0	$44.3	$119.7	$242.4	$1,047.2
IDC	$32.9	–	–	–	$330.0

Source: eMarketer, 2001; various, as stated

In addition, Gartner Group estimates that B2B e-commerce will stand at $992 billion in 2004.

Internet Penetration Among Asian Businesses

Even though forecasts for e-commerce growth in Asia are quite rosy, the current e-commerce environment is still immature. According to a survey conducted by Access Media of 2,137 companies surveyed in five Asian markets (South Korea, Singapore, China, Taiwan, and Hong Kong), only 476 companies – less than a quarter – are currently conducting e-commerce. Those remaining firms that are not currently online plan to do so within two years. What's more, the majority of the companies polled had annual budgets for e-commerce of less than $50,000.

C. Australia

QuickStats: Australia

Australia	2000
Total Population (millions)[1]	19.2
Adult Population (millions)[1]	15.4
Active Internet Users (millions)[2]	4.1
% Active Internet Users	26.3
Total GDP ($ Billions) PPP[3]	$416.2
GDP Per Capita PPP[3]	$22,200.0
Credit Cards Per Person	0.6
Total eCommerce (billions)[2]	$2.6
B2C eCommerce (billions)[2]	$0.3
B2B eCommerce (billions)[2]	$2.3

Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

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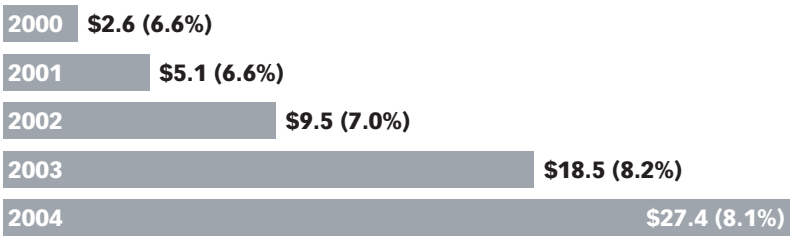
Australia is one of the most technologically advanced countries in the Asia Pacific region. The number of active internet users in this country will reach 4.1 million in 2000, representing 26% of the population over the age of 14. The Australian government is also an active participant in the internet space, heavily promoting and preaching the benefits of e-commerce.

eCommerce Revenues

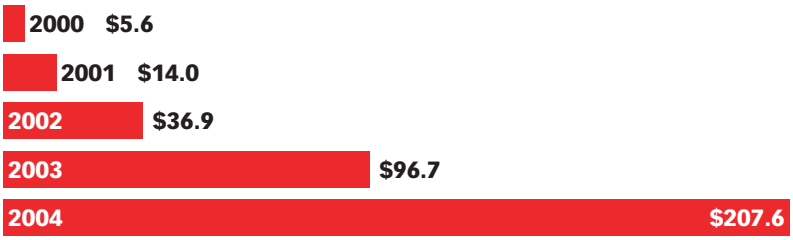
eCommerce revenues in Australia grew to $2.6 billion by the end of 2000 with business-to-business operations accounting for almost 90% of the total. Because of its limited scale, Australian e-commerce revenues will continue to account for less than 10% of the region's total in the foreseeable future.

eCommerce Revenues in Australia, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

eCommerce Revenues in Australia, 2000–2004 (in billions)



Source: Forrester Research, 2000

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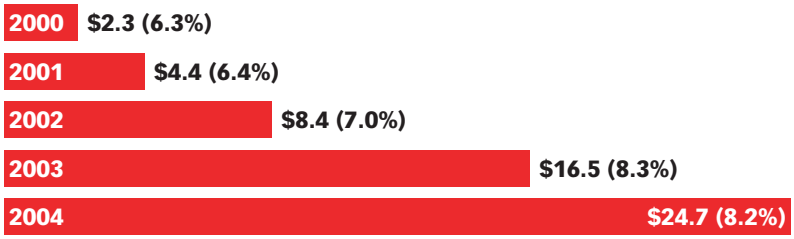
B2B eCommerce

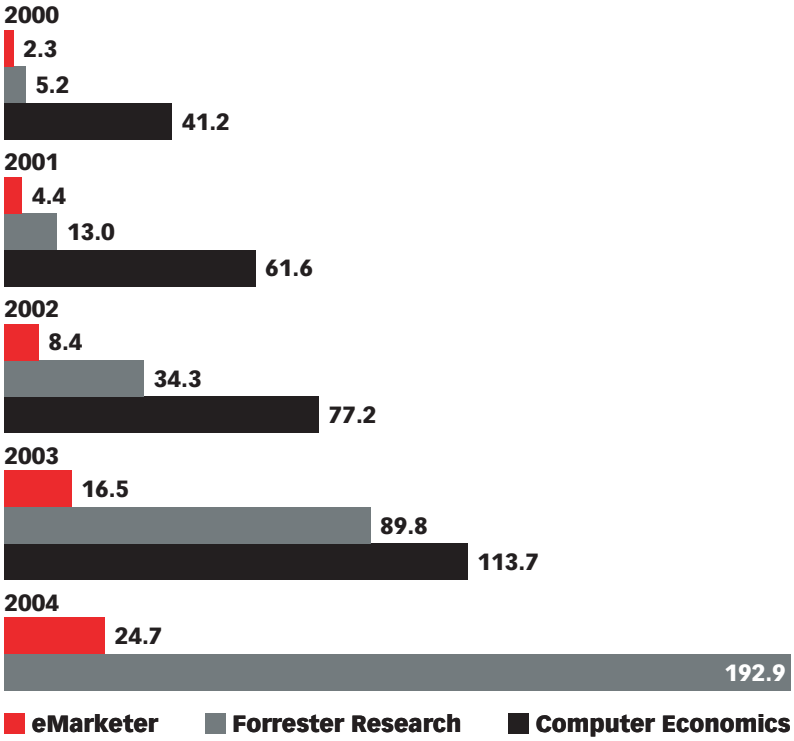
Australian B2B e-commerce rose to $2.3 billion in 2000, accounting for 6.3% of the region's total B2B revenues. B2B e-commerce revenues will grow to more than $24 billion by 2004.

B2B eCommerce Revenues in Australia, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

Comparative Estimates: B2B eCommerce Revenues in Australia, 2000–2004 (in billions)



Source: eMarketer, 2001; various as stated

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D. China

QuickStats: China

China	2000
Total Population (millions)[1]	1,261.8
Adult Population (millions)[1]	964.9
Active Internet Users (millions)[2]	8.3
% Active Internet Users	0.9
Total GDP (billions) PPP[3]	$4,800.0
GDP Per Capita PPP[3]	$3,800.0
Credit Cards per Capita	0.02
Total eCommerce (billions)[2]	$0.8
B2C eCommerce (billions)[2]	$0.0
B2B eCommerce (billions)[2]	$0.8

Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

China's pending entry into the WTO is creating much excitement among internet entrepreneurs. Many foreign businesses are salivating at the prospect of selling their products and services online to a country of over 1.2 billion people. These hopes must be tempered by the fact that China still ranks as one of the poorest nations in Asia with a GDP per capita at around $800. To put it bluntly, it's a pipe dream to think the Chinese internet market penetrates beyond the major urban areas.

The Chinese government, however, is genuinely enthusiastic about the future of the internet. Beijing's regime believes this new medium will serve as an engine to further revitalize its economy. On the flipside, however, the government is also adamant about maintaining control over its development and the flow of information coming into China.

eCommerce Revenues

Total online revenues in China grew to $818 million in 2000, or 2.1% of the region's total online revenues. As the country's user base continue to grow, e-commerce revenues will swell to more than $23 billion by 2004. In fact, China will be the fastest growing country among the eight core countries covered within the Asia Pacific region. Even though total e-commerce in China is growing quite rapidly, its share of the region is still quite small, as it will account for only 7% of the region's total by 2004.

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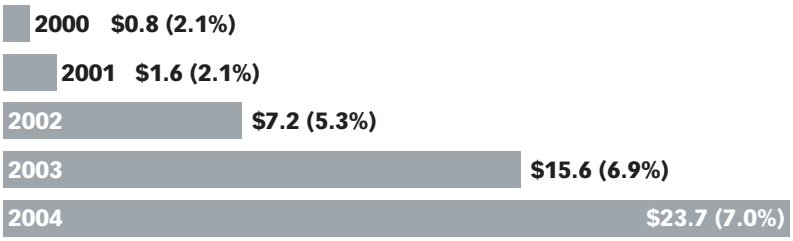
eCommerce Revenues in China, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

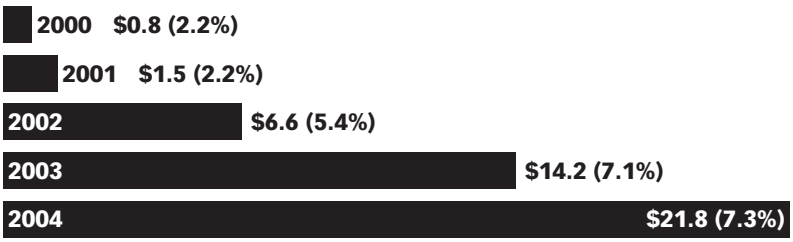
eCommerce Revenues in China, 2000 & 2002 (in billions)

Source: Ministry of Information Industry, 2000

B2B eCommerce

New estimates from eMarketer estimate revenues in the B2B segment to have reached $785 million by the end of 2000.

B2B eCommerce Revenues in China, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

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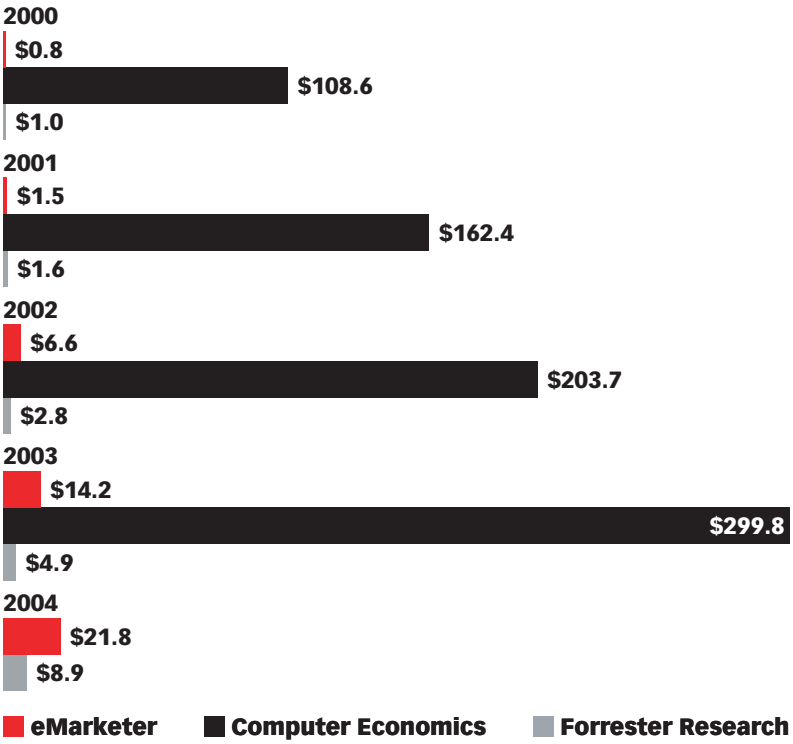
Comparative Estimates: B2B eCommerce Revenue in China, 2000–2004 (in billions)



Source: eMarketer, 2001; various as stated

Many researchers have identified China as the next internet boomtown, especially with regards to the country's burgeoning B2B segment. Unbridled enthusiasm, however, needs to be grounded in a bit of reality. The B2B segment is in fact faced with the same kind of struggles as the country's B2C segment. It is very difficult to measure success when only a few operations are actually making money. Most sites can point to the potential windfall from the huge market, as they wait to turn a profit. But until they start to offer value-added services and generate real revenues, they will continue to subsist solely on venture capital funding and online advertising.

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E. Hong Kong

QuickStats: Hong Kong

Hong Kong	2000
Total Population (millions)[1]	7.1
Adult Population (millions)[1]	5.9
Active Internet Users (millions)[2]	1.2
% Active Internet Users	19.7
Total GDP ($ Billions) PPP[3]	$158.2
GDP Per Capita PPP[3]	$23,100.0
Credit Cards Per Capita	1.2
Total eCommerce (millions)[2]	$668.7
B2C eCommerce (millions)[2]	$66.9
B2B eCommerce (millions)	$601.8

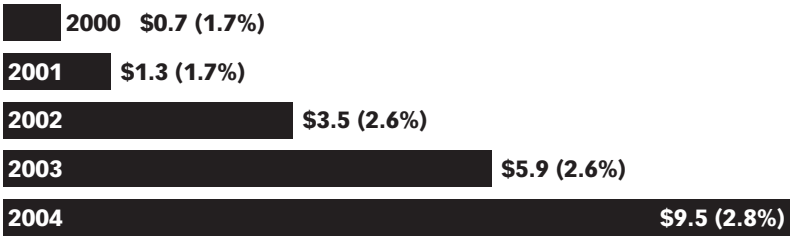
Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

In an effort to become the hub of internet activities in Asia, Hong Kong has been quick to develop its e-commerce strategies in both the B2B and B2C markets. Government-sponsored programs such as the "Digital 21" policy initiative is making broadband connection available to everyone in the city. Hong Kong's tremendous growth has also been fueled in part by its proximity to mainland China as well as its excellent telecom infrastructure and competitive financial sector.

eCommerce Revenues

eCommerce revenues in Hong Kong reached $668.7 million in 2000. This figure represents only 1.7% of the region's total e-commerce revenues. By the year 2004, eMarketer expects total e-commerce revenues in Hong Kong to raise to almost $9.5 billion.

eCommerce Revenues in Hong Kong, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

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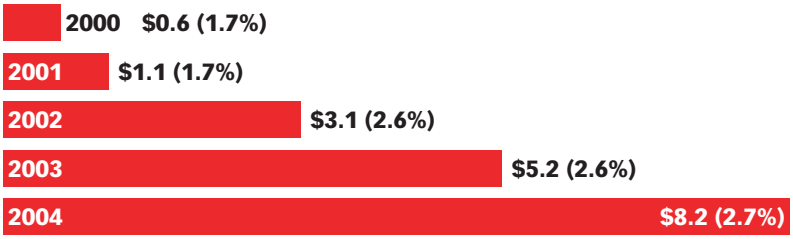
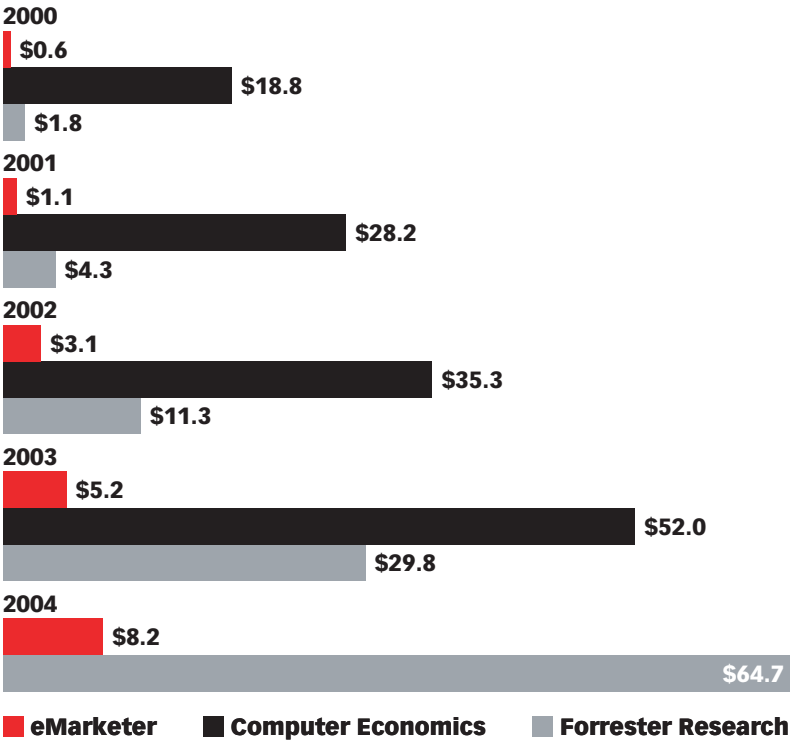
The B2B segment is set to become the main source of the internet growth in Hong Kong's burgeoning internet marketplace. eMarketer estimates total B2B revenues in 2000 of $600 million, a figure expected to reach $8.2 billion by the end of 2004.

B2B eCommerce Revenues in Hong Kong, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

Comparative Estimate: Total B2B eCommerce Revenues in Hong Kong, (in billions)



Source: eMarketer, 2001; various as stated

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F. India

QuickStats: India

India	2000
Total Population (millions)[1]	1,014.0
Adult Population (millions)[1]	695.8
Active Internet Users (millions)[2]	1.8
% Active Internet Users	0.4
Total GDP (in billions) PPP[3]	$1,805.0
GDP Per Capita PPP[3]	$1,800.0
Credit Card Penetration	0.003
Total eCommerce (in billions)[2]	$0.1
B2C eCommerce (in billions)[2]	$0.0
B2B eCommerce (in billions)[2]	$0.1

Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

"Leveraging Indian talent for global markets is a no-brainer."

— Somshankar Das, e4e Ventures

India is a country of contradictions. Even with rampant poverty across much of the nation, India has become an important supplier of human capital to the information technology industry in the West. The Indian government has caught on to this trend as well. It is leveraging the strength of the country's IT industry to jumpstart its economy. Numerous legislations have been passed that aimed to fuel the digital economy in India. eCommerce, however, has yet to take hold in India. Widespread poverty throughout much of the country as well as inadequate telecom infrastructure are limiting the internet diffusion only to a privileged few in urban India.

Total eCommerce Revenues

eCommerce revenues in India reached $121.3 million by the end of 2000. Indian e-commerce revenues for 2000 accounts for less than 1% of the region's total. By 2004, eMarketer estimates total e-commerce revenues should reach $6.1 billion, accounting for almost 2% of the region's total.

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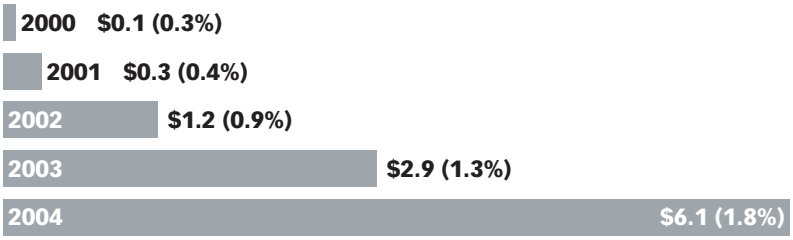
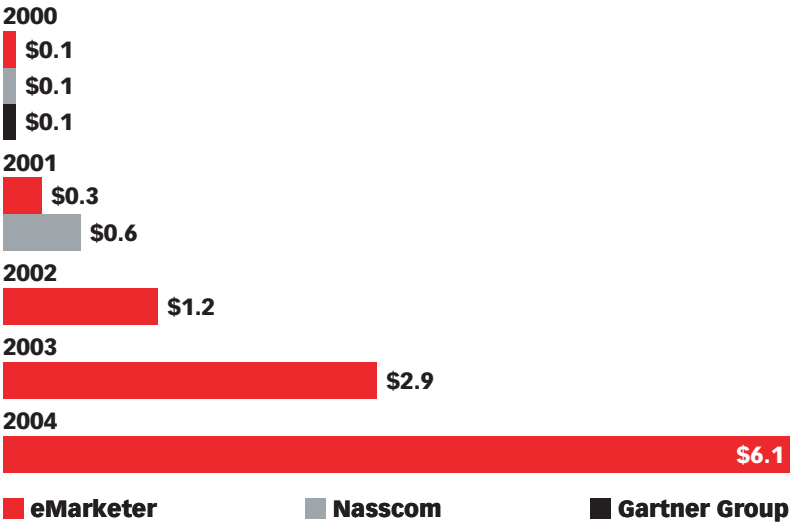
eCommerce Revenues in India, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

Comparative Estimates: Total eCommerce Revenues in India (in billions)



Source: eMarketer, 2001; various as stated

B2B eCommerce

The Indian B2B segment is set to take off faster than the B2C segment. According to ebusinessforum.com, there are more than a dozen B2B portals currently operating in India, with around 6,000 companies listing goods and services through the sites. The recently passed Information Technology Bill that allows for 100% foreign ownership of Indian-based B2B ventures will certainly attract more funds into India. Different researchers have come up with different estimates as to the level of B2B revenues.In 2000, total B2B revenues reached $109 million.

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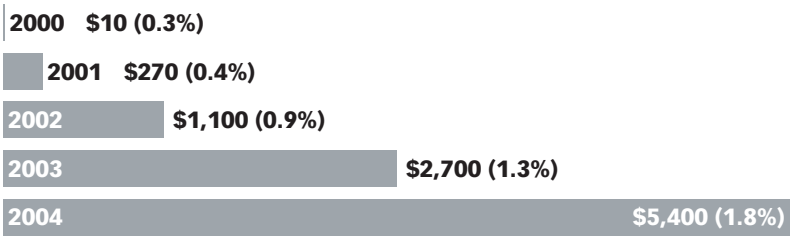
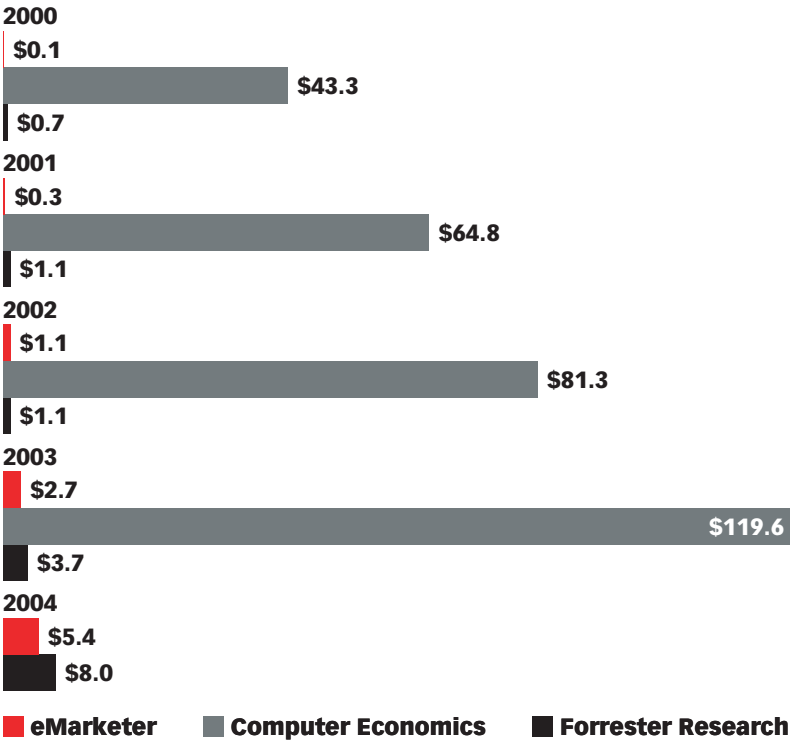
B2B Revenues in India, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

Comparative Estimates: B2B eCommerce Revenues in India (in billions)



Source: eMarketer, 2001; various as stated

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G. Japan

QuickStats: Japan

Japan	2000
Total Population (millions)[1]	126.5
Adult Population (millions)[1]	109.2
Active Internet Users (millions)[2]	17.7
% Active Internet Users	16.2
Total GDP (billions) PPP[3]	$2,950.0
GDP Per Capita PPP[3]	$23,400.0
Credit Cards Per Capita	1.8
Total eCommerce (billions)[2]	$27.3
B2C eCommerce (billions)[2]	$2.2
B2B eCommerce (billions)[2]	$25.2

Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

"Japan is actually the best example in Asia of how the New Economy will accelerate the restructuring process by providing the long-overdue catalyst. This is not only because of the quantum leaps in productivity that can result, but also because it provides a neat way of leap-frogging or bypassing vested interests and all forms of obscurantism in a society adverse to confrontation."

— Christopher Wood, Economist, ABN-AMRO Hong Kong

Japan is the undisputed leader of Asian e-commerce. eCommerce was essentially nonexistent in Japan a few years ago, but the landscape is changing fast. More and more Japanese are now getting online, as evidenced by the boom in the country's PC sales. Wireless internet access, in particular NTT DoCoMo's i-mode internet ready phone, has given millions of Japanese another option to get online.

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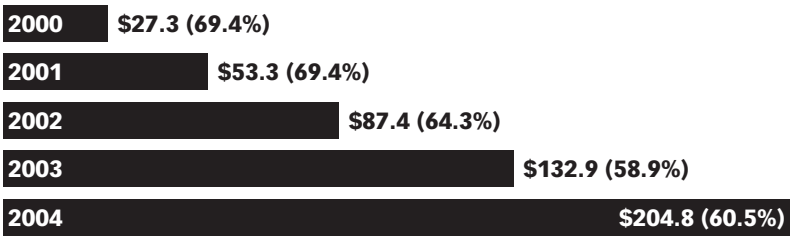
eCommerce Revenues

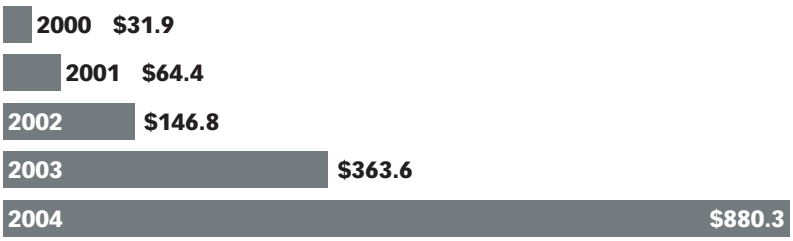
eCommerce revenues in Japan dwarf the rest of the region, as more than $27 billion generated by the end of 2000. The share of the Japanese total e-commerce revenues for 2000 account for almost 70% of the region's total. As the rest of Asia plays catch up to Japan, its share of the e-commerce pie will shrink to just a bit over 60% by 2004.

eCommerce Revenues in Japan, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

eCommerce Revenues in Japan (in billions)



Source: Forrester Research, 2000

B2B eCommerce

The largest e-commerce market segments in Japan are real estate and automobiles. Together they account for almost half of all e-commerce activities in Japan. eMarketer expects total B2B revenues in 2000 to reach $25.2 billion. This total is expected to climb to more than $180 billion by the end of 2004.

The internet has the ability to change many old Japanese business practices. With B2B e-commerce, online marketplaces and exchanges can transform Japan's inefficient and expensive distribution system by eliminating many layers of middlemen that hamper economic efficiencies.

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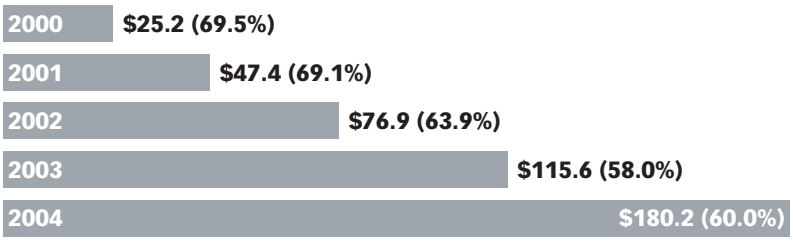
B2B eCommerce Revenues in Japan, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

Comparative Estimate: Total B2B eCommerce Revenues in Japan (in billions)

	2000	2001	2002	2003	2004
eMarketer	**$25.2**	**$47.4**	**$76.9**	**$115.6**	**$180.2**
Computer Economics	$427.5	$638.4	$802.0	$1180.3	–
Forrester Research	$29.6	$59.9	$136.3	$337.8	$817.8
Goldman Sachs & Co.		$11.7	$45.8	$100.4	$188.6
IDC	$27.5				361.8

Source: eMarketer, 2001; various as stated

H. Singapore

QuickStats: Singapore

Singapore	**2000**
Total Population (millions)[1]	4.2
Adult Population (millions)[1]	3.4
Active Internet Users (millions)[2]	1.2
% Active Internet Users	36.2
Total GDP (billions) PPP[3]	$98.0
GDP Per Capita PPP[3]	27,800.0
Credit Cards Per Person	0.6
Total eCommerce (billions)[2]	$0.6
B2C eCommerce (billions)[2]	$0.1
B2B eCommerce (billions)[2]	$0.5

Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

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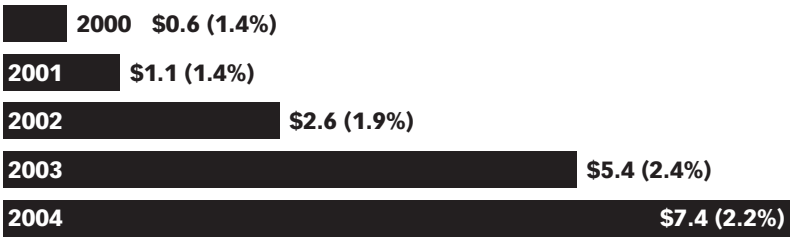
In many ways, Singapore is in a race with Hong Kong to become a strategic center for Asian e-commerce. Similar to its counterpart, the potential for e-commerce success is great in Singapore. The country boasts one of the most sophisticated telecom infrastructures in the world. Its population base is wealthy and literate. Perhaps most important of all is the fact that the Singapore government has been an active force in this process. Laws and regulations are generally favorable for the development of internet and e-commerce. The government is setting out to create a competitive environment that should spur economic growth going forward.

eCommerce Revenues

According to eMarketer, total e-commerce revenues in Singapore were expected to reach $560 million in 2000. This figure represents about 1.4% of the region's total e-commerce revenues. By the year 2004, eMarketer expects total e-commerce revenues in Singapore to climb to almost $7.5 billion.

eCommerce Revenues in Singapore, 2000-2004 (in billions and as % of region)



Source: eMarketer, 2001

IDC estimates that Singapore's e-commerce revenues will reach $2.8 billion in 2003.

B2B eCommerce

The B2B segment will account for a significant portion of the internet growth in Singapore. According to eMarketer. Total B2B revenues in 2000 reached $492 million. This total should climb to $6.6 billion by the end of 2004.

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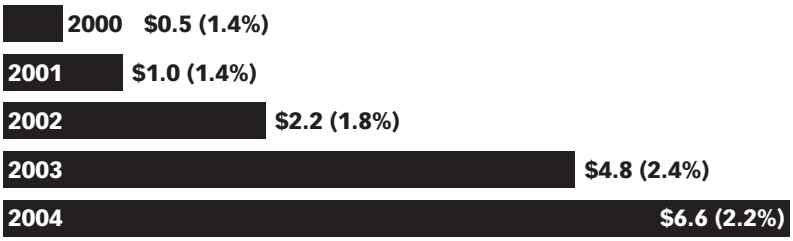
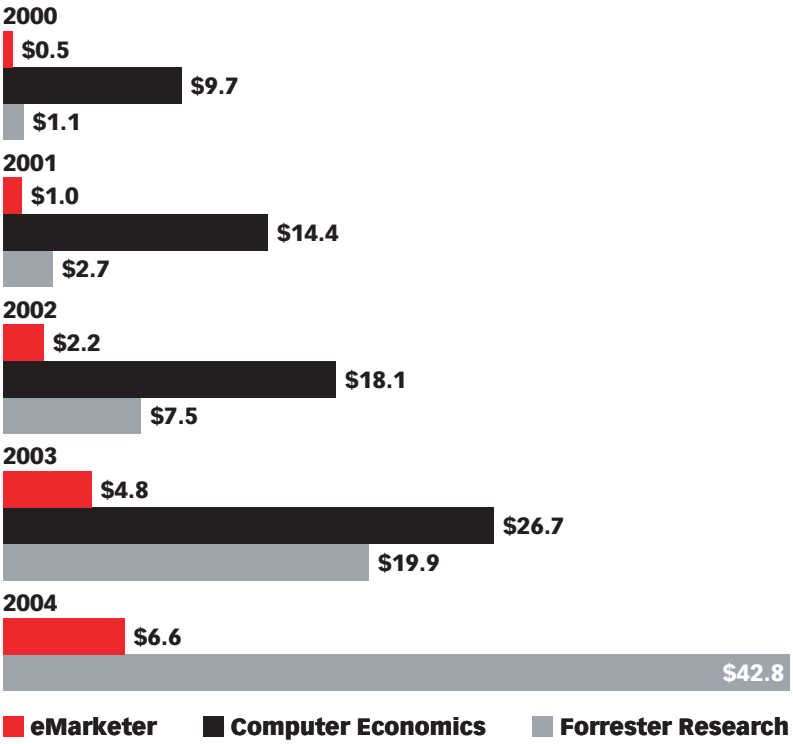
B2B eCommerce Revenues in Singapore, 2000–2004 (in billions and as a % of region)



Source: eMarketer, 2001

Comparative Estimates: eCommerce Revenues in Singapore, 2000–2004 (in billions)



Source: eMarketer, 2001; various as stated

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I. South Korea

QuickStats: South Korea

South Korea	2000
Total Population (millions)[1]	47.5
Adult Population (millions)[1]	37.8
Active Internet Users (millions)[2]	6.8
% Active Internet Users	17.9
Total GDP ($ Billions) PPP[3]	$625.7
GDP Per Capita PPP[3]	$13,300.0
Business Penetration	–
Credit Cards Per Person	0.6
Total eCommerce (billions)[2]	$1.9
B2C eCommerce (billions)[2]	$0.2
B2B eCommerce (billions)[2]	$1.8

Note: eCommerce revenues do not add up because of rounding.
Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

"South Korea is the only country in Asia that has enough critical mass, acceptance, both volume and scale, to create significant revenues, where the internet is being adopted very aggressively."

— Matei Mihalca, Merrill Lynch Asia-Pacific, Hong Kong

South Korea is quickly becoming an internet powerhouse. The government is ambitiously trying to transform the country into an IT-based economy. Perhaps the most dramatic development in South Korean e-commerce is the rapid adoption of online trading and online finance. The central bank recently reported that 16 of the 21 domestic banks have already started offering internet banking services first quarter this year. The remaining banks are expected to join the fray by the end of the year.

eCommerce Revenues

Total online revenues in South Korea reached $1.9 billion in the year 2000, or 4.8% of the region's total online revenues. As the internet becomes more and more widespread, e-commerce revenues will reach almost $16 billion by 2004.

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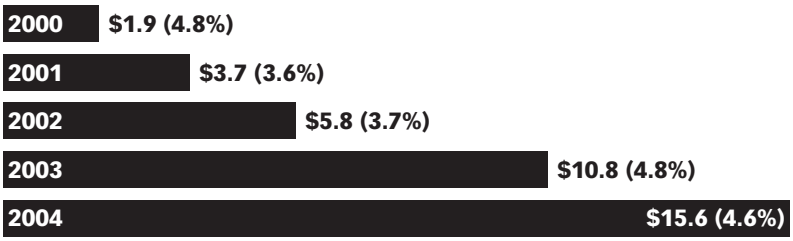
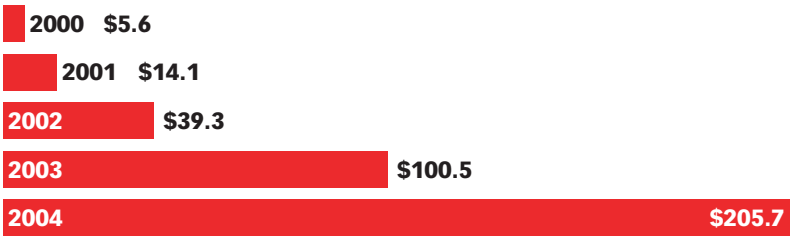
eCommerce Revenues in South Korea, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

eCommerce Revenues in South Korea, 2000–2004 (in billions)

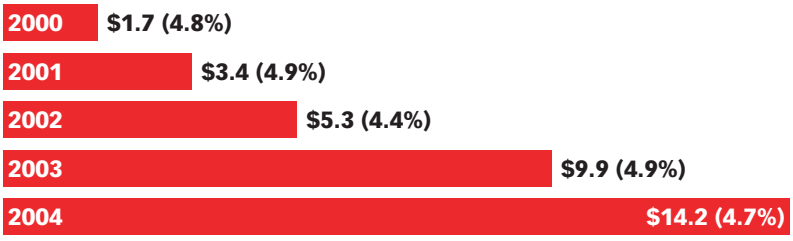


Source: Forrester Research, 2000

B2B eCommerce

Even with the government's focus on SMEs, the country's top four chaebol, namely Samsung, LG, SK, and Hyundai, still dominate the B2B marketplace. The total B2B e-commerce will rose to $1.7 billion by 2000, accounting for 4.8% of the region's total B2B revenues. According to eMarketer, total B2B e-commerce revenues will rise to $14 billion by 2004.

B2B eCommerce Revenues in South Korea, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

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J. Taiwan

QuickStats: Taiwan

Taiwan	2000
Total Population (millions)[1]	22.2
Adult Population (millions)[1]	17.7
Active Internet Users (millions)[2]	4.0
% Active Internet Users	22.8
Total GDP ($ Billions) PPP[3]	357.0
GDP Per Capita PPP[3]	16,100.0
Credit Cards Per Person	1.1
Total eCommerce (in billions)[2]	$2.3
B2C eCommerce (in millions)[2]	$0.2
B2B eCommerce (in millions)[2]	$2.1

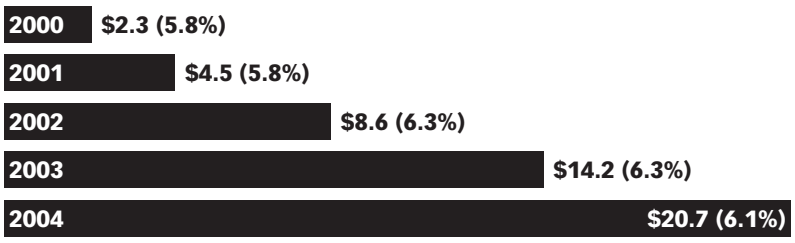
Sources: 1) United States Bureau of Census, International Database; 2)eMarketer 2001; 3) IMF

Taiwan is the third-largest producer of information hardware products in the world. The country supplies plenty of PCs and electronic components to the world market. Taiwanese people have quickly embraced the internet. It has quickly become an important resource for Taiwan's tech-savvy consumers and businesses.

eCommerce Revenues

According to eMarketer, total e-commerce revenues in Taiwan reached $2.3 billion by 2000. eCommerce revenues will continue to grow at a brisk pace to more than $20.7 billion by 2004. The share of the region's total will continue to hover around 6%.

Total eCommerce Revenues in Taiwan, 2000–2004 (in billions and as % of region)



Source: eMarketer, 2001

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eCommerce Revenues in Taiwan (in billions)

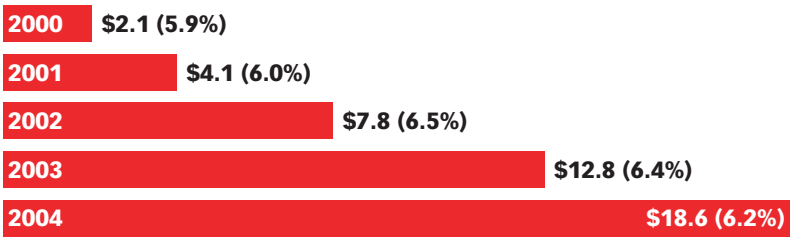
Source: Forrester Research, 2000

In addition, IDC estimates that e-commerce revenues will reach $5.2 billion in 2003.

B2B eCommerce

Taiwan companies are rapidly moving into the B2B segment. Total B2B e-commerce rose to $2.1 billion by 2000, accounting for 5.9% of the region's total B2B revenues. According to eMarketer, total B2B e-commerce revenues will rise to more than $18.7 billion by 2004. Estimates from the Institute for Information Industry reported that 20,000 companies are expected to account for $4.4 billion in e-commerce transactions in 2000. This figure should grow to $8.4 billion by 2001, making Taiwan one of the region's most exciting B2B markets.

B2B eCommerce Revenues in Taiwan, 2000–2004 (in billions and as a % of region)



Source: eMarketer, 2001

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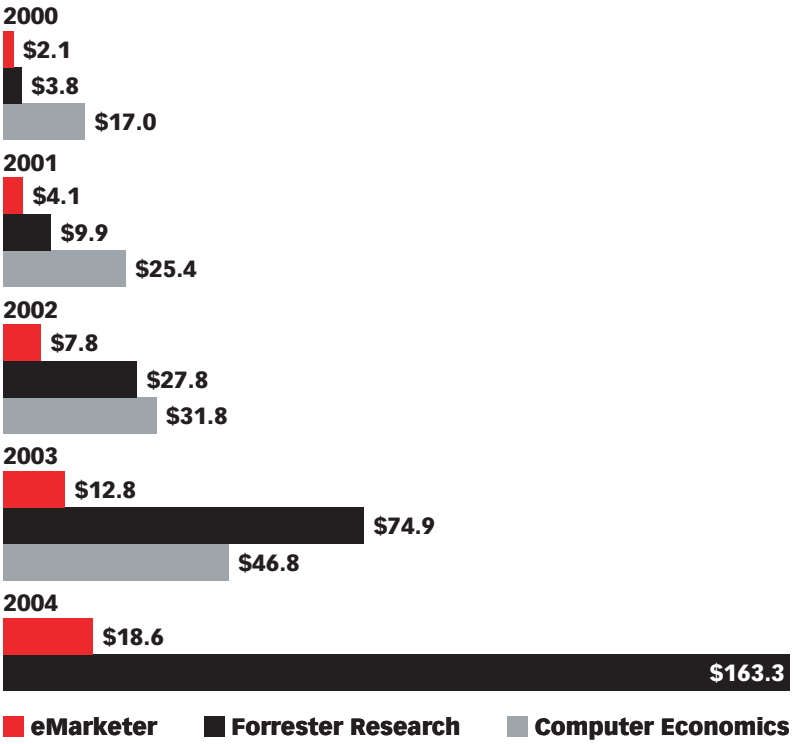
Comparative Estimate: Total B2B eCommerce Revenues in Taiwan, (in billions)



Source: eMarketer, 2001; various as stated

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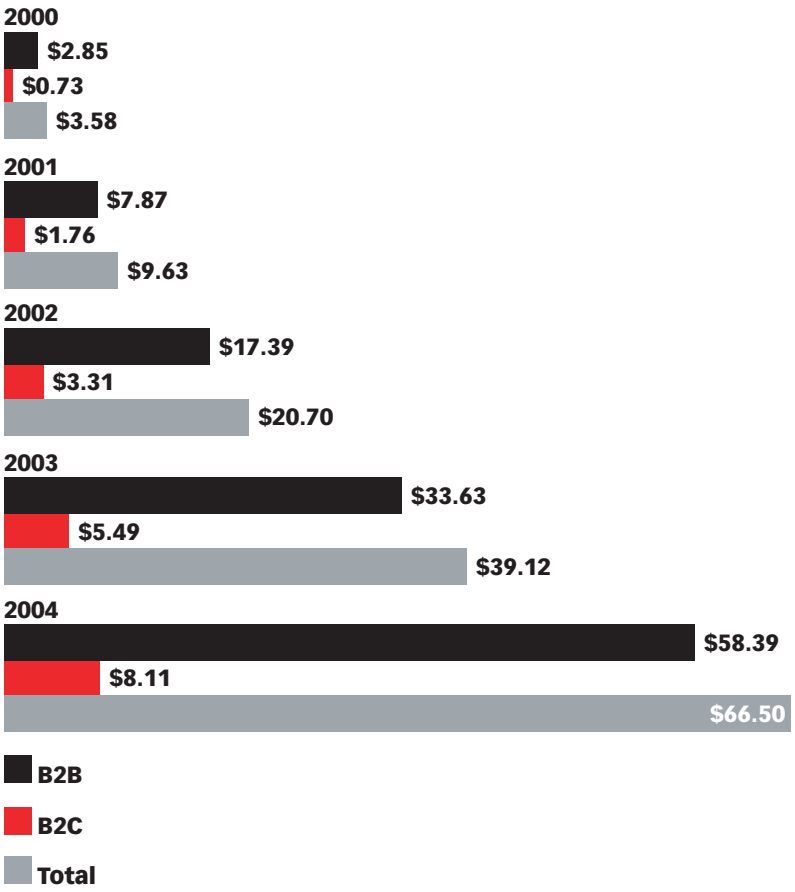
A. Introduction

Total e-commerce revenues in Latin America reached $3.58 billion in 2000, with B2B transactions of $2.85 billion and B2C transactions of $724 million.

Overall e-commerce revenues will increase markedly by 2004, largely fueled by advances in the B2B segment. Businesses of all sizes as well as national and local governments will increasingly do their procurement online. The number of B2C sites will likely contract in the near term.

eCommerce in Latin America, 2000–2004 (in billions)



Source: eMarketer, 2001

Despite the more optimistic assessment of e-commerce in the region, Latin America's share of worldwide e-commerce remains small, accounting for just over 1% of the total transaction volume. Only the Middle East and Africa represent a smaller share of the pie.

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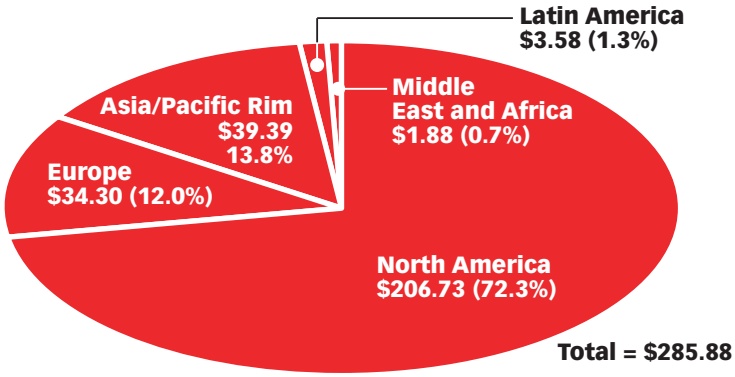
Worldwide eCommerce Distribution by Region, 2000 (in billions)



Source: eMarketer, 2001

Globally, e-commerce will see an upward trend over the next few years. A study conducted by the RED Consultancy for DHL Worldwide Express among several hundred companies in 12 countries with more than $15 million in revenues found that 86% of companies expect increased total sales as a result of trading online. However, the survey also revealed the significant challenges that lie ahead:

- 74% of companies lack a dedicated e-commerce department and
- 79% of businesses worldwide are not currently trading on the internet

From 2000 to 2004, Latin America's share of worldwide e-commerce transactions will increase slightly, but will hover around 2% of the total. Europe will be the big gainer worldwide in terms of market share. In Latin America, B2B transactions will account for an increasing share of the total, rising from 79.8% in 2000 to 87.8% in 2004.

With its sizeable population heavily concentrated in large cities, Latin America's potential for e-commerce remains vast. Brazil, the largest, most populous country in the region, is by far the leading market for internet commerce in both the B2B and B2C segments. It has an advanced, highly automated industrial sector that will benefit considerably from the cost savings associated with online procurement, and a large, fairly cohesive consumer market located primarily in urban areas. All countries, however, will see impressive growth in e-commerce revenues over the next few years, although the B2B sector will grow most quickly. Revenues in the B2C segment will also increase, but a familiar set of factors—low credit card, PC, and telephone penetration rates, fragile infrastructure, limited parcel delivery systems and high internet access costs—will continue to hinder growth across the region.

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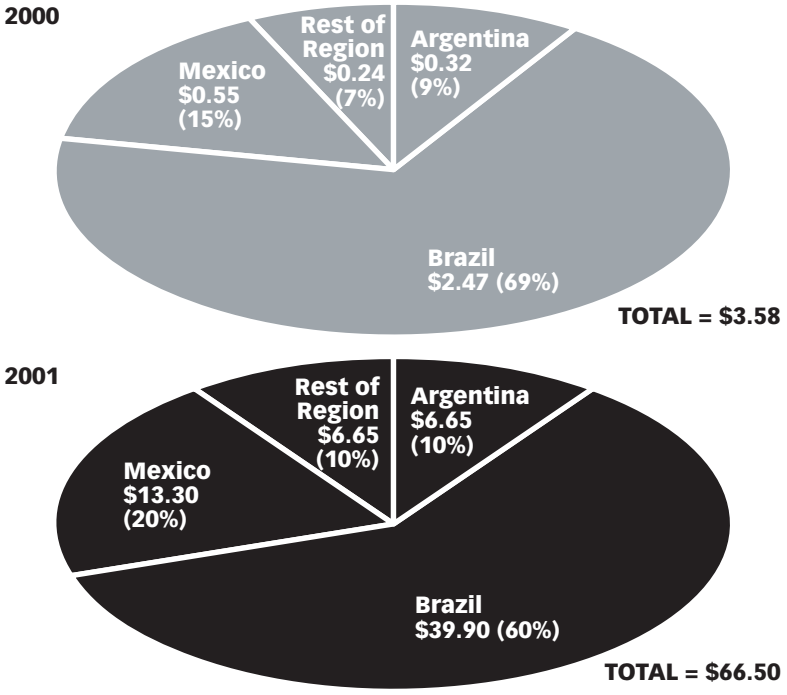
eCommerce in Latin America, 2000–2004 (in billions)

Country	2000	2001	2002	2003	2004
Argentina	$0.32	$0.87	$2.28	$3.91	$6.65
Brazil	$2.47	$6.55	$12.63	$24.25	$39.90
Mexico	$0.55	$1.54	$4.14	$7.43	$13.30
Rest of Region	$0.24	$0.67	$1.66	$3.52	$6.65
Total	**$3.58**	**$9.63**	**$20.70**	**$39.12**	**$66.50**

Note: Figures may not add up precisely due to rounding.
Source: eMarketer, 2001

Brazil, the powerhouse for all things internet in Latin America, will account for nearly 70% of the region's e-commerce revenues in 2000. Its share will drop to 60% by 2004 as e-commerce increases in the rest of the region. Mexico's share in particular will show the largest growth, fueled by industrial and assembly operations that are tightly linked to the global supply chain. Meanwhile, Argentine e-commerce will develop at a more modest pace.

eCommerce Distribution in Latin America, 2000 & 2004 (in billions)



Source: eMarketer, 2000

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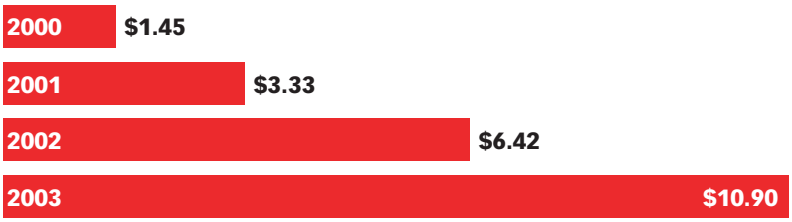
eMarketer's estimate tends to be higher than forecasts by other firms (with the exception of Forrester Research), as the following charts show. Forrester Research has released the most optimistic estimates of e-commerce revenue in the region based on assumptions about "hypergrowth" in online B2B transactions. In addition, Forrester's numbers are greater in part because they include EDI transactions as part of their projections.

eCommerce in Latin America, 2000–2004 (in Billions)

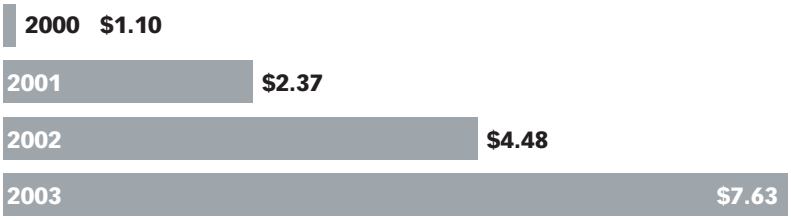
Source: Forrester Research, 2000

eCommerce in Latin America, 2000–2003 (in billions)



Source: International Data Corp. (IDC), 2000

eCommerce in Latin America, 2000–2003 (in billions)



Note: Includes revenues from the sale of goods and services among businesses and to final consumers.
Source: Morgan Stanley Dean Witter, 2000

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B2B eCommerce

The high level of fragmentation in the supply chain in Latin America means that tremendous opportunities exist in the B2B segment of the e-commerce market. For that reason, eMarketer expects B2B e-commerce revenues to grow rapidly in the next few years, and gain an increasing share of overall e-commerce revenues in the region. Latin American firms have been slow to implement electronic data interchange (EDI) and enterprise resource planning (ERP) software largely because of the tremendous start-up costs involved.

Bringing procurement and transaction activities online will also involve considerable costs, and the investment in the requisite telecommunications and computer technology initially will be burdensome, particularly for small and medium-sized enterprises (SMEs), but the savings from lower purchasing prices, transaction costs, and inventory levels could dramatically increase overall operating margins.

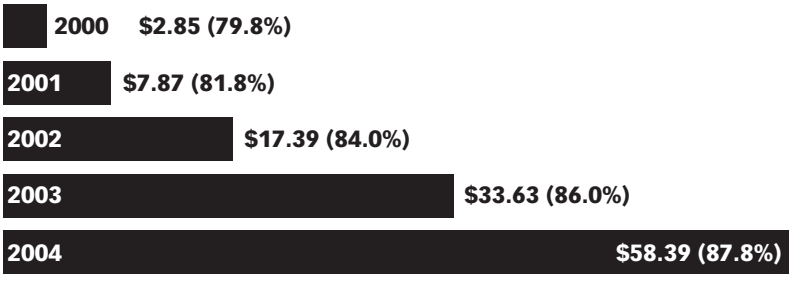
B2B eCommerce in Latin America, 2000–2004 (in billions)

Country	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
Total	**$2.85**	**$7.87**	**$17.39**	**$33.63**	**$58.39**

Note: Figures may not add up precisely due to rounding.
Source: eMarketer, 2001

B2B e-commerce constitutes the overwhelming majority of online commerce revenues in Latin America: 79.76% in 2000. Its share will increase to 87.80% in 2004, as marketplaces and exchanges mature, and as more businesses and governments move to online procurement.

B2B eCommerce, 2000–2004 (in billions and as a % of total Latin American e-commerce)



Source: eMarketer, 2001

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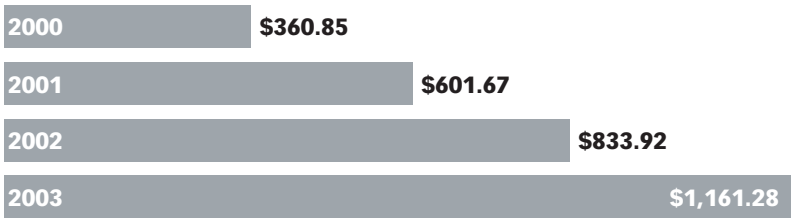
The interesting fact about Forrester's projections is that by 2002 the firm forecasts higher total B2B e-commerce revenues for Mexico than for all of the rest of Latin America, including Brazil. This prediction runs contrary to nearly all other forecasts but can perhaps be attributed to Mexico's proximity to the United States and the degree to which its assembly operations are closely linked to global supply chains.

In addition, Forrester sees hypergrowth occurring in Mexico in 2003, one year before Brazil, and several years prior to the rest of Latin America. In this context, Computer Economics is clearly an outlier whose predictions far exceed even the most optimistic estimates.

B2B eCommerce in Latin America, 2000–2003 (in billions)

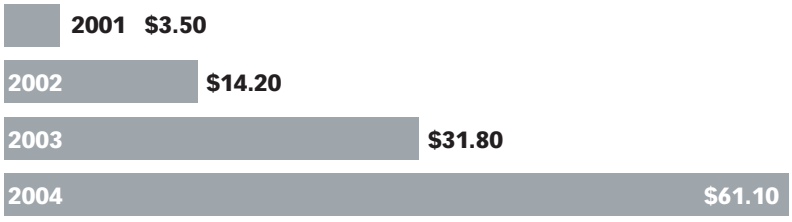


Source: Computer Economics, 2000

B2B eCommerce in Latin America, 2000–2004 (in billions)

Source: Forrester Research, 2000

B2B eCommerce in Latin America, 2001–2004 (in billions)



Note: Figures do not include Mexico.
Source: Goldman Sachs, 2000

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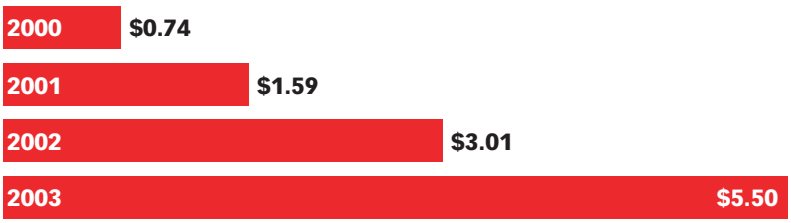
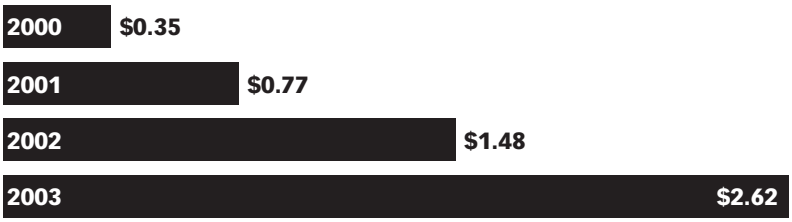
B2B eCommerce in Latin America, 2000–2003 (in billions)



Source: Morgan Stanley Dean Witter, 2000

B2B eCommerce in Latin America, 2000–2003 (in billions)



Source: International Data Corp. (IDC), 2000

B. Argentina

QuickStats: Argentina

Argentina	2000
Total Population (in Millions)[1]	36.9
Population 14+ (in Millions)[2]	27.7
Population Living in Urban Areas (1999)[3]	90%
Average GDP per Capita[4]	$7,898
PCs per 100 Inhabitants (1999)[5]	4.92
Main Telephone Lines per 100 Inhabitants (1999)[5]	20.11
Mobile Cellular Subscribers per 100 Inhabitants (1999)[5]	12.12
Internet Users (in Millions)[2]	1.0
Internet Users as % of Pop. 14+[2]	3.6%

Source: [1]US Census Bureau, 2000; [2]eMarketer, 2001; [3]World Bank, 2000; [4]International Monetary Fund (IMF), 2000; [5]International Telecommunication Union (ITU), 2000; [7]Morgan Stanley Dean Witter, 1999

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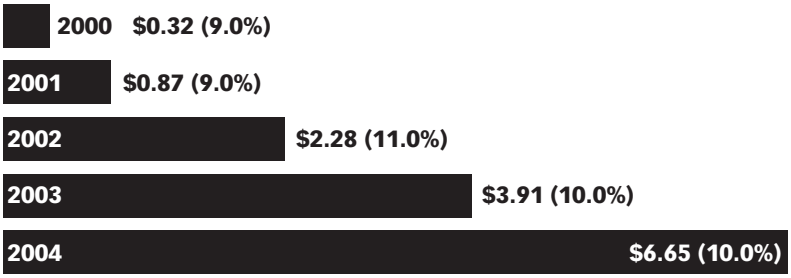
Argentina's relative economic health sets it apart from other countries in the region. Per capita GDP is among the highest in Latin America and most Argentines are highly literate. More than one-third of the population resides in the capital city of Buenos Aires, providing a highly concentrated potential market of online consumers. Both B2C and B2B e-commerce revenues will increase markedly in the years ahead, although steeper growth in Mexico will prevent Argentina's share of total Latin American e-commerce from climbing past 11% at any point between 2000 and 2004.

eCommerce Revenues in Argentina, 2000–2004 (in billions and as a % of total Latin American e-commerce)



Source: eMarketer, 2001

eMarketer's e-commerce estimates for Argentina fall toward the middle of the pack of forecasts by other research firms. Forrester Research's estimate is the highest, while Morgan Stanley Dean Witter's forecast is considerably lower than eMarketer's. As with its other e-commerce estimates, Forrester's predictions for Argentina are based on the notion of hypergrowth, which is scheduled to take place in 2005.

eCommerce Revenues in Argentina, 2000–2004 (in billions)

Source: Forrester Research, 2000

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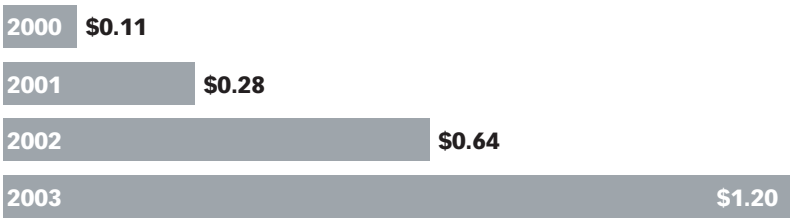
eCommerce Revenues in Argentina, 2000–2003 (in billions)



Source: Morgan Stanley Dean Witter, 2000

With a GDP per capita (PPP) of $10,000, Argentines have greater purchasing power than most of their neighbors. More than a quarter of the population has a credit card and most research firms have found that Argentina has a high percentage of internet users who buy online: 17.86% in 2000 according to Jupiter Research and 23% according to Prince & Cooke. Among the "advanced" internet users (who responded to banner ads requesting their participation in a study about the internet) surveyed by IDC, the average monthly online home expenditure in Argentina was $76, the highest among the countries surveyed and well above the average of $58 for IDC's pan-Latin sample.

Although Argentina's internet and telephone penetration rates are among the highest in Latin America, the cost of telecommunications service remains a hindrance to internet growth. However, this situation will undoubtedly change after Argentina completes the deregulation of the entire telecommunications market in November 2000. Competition is likely to drive prices down, perhaps as much as 20% to 40%. Lower telephone charges, combined with the government's efforts to provide low-cost internet access to a wider segment of the population, should provide a boost to consumer e-commerce in Argentina.

B2B eCommerce

eMarketer foresees robust growth in Argentina's B2B e-commerce market over the next few years, with revenues climbing from $270 million in 2000 to $5.92 billion in 2004. These estimates put eMarketer in the middle of forecasts by other research firms. As with optimistic predictions for growth in the B2C segment, development of the B2B market will depend on economic stability and the capacity of businesses to make the necessary ongoing investments to bring their operations online.

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eMarketer and Forrester Research estimates show convergence through 2003, and then begin to diverge widely by 2004, as Argentina approaches what Forrester sees as the country's period of hypergrowth. Once again, Computer Economics is the outlier of the group, predicting B2B revenues for 2000 that are one hundred times as large as eMarketer's forecast.

Comparative Estimates: B2B eCommerce Revenues in Argentina, 2000–2004 (in billions)

	2000	2001	2002	2003	2004
eMarketer	**$0.27**	**$0.75**	**$1.98**	**$3.48**	**$5.92**
Forrester Research	$0.62	$1.06	$1.95	$4.08	$9.76
Morgan Stanley	$0.08	$0.20	$0.45	$0.86	–
Computer Economics	$27.55	$48.21	$72.32	$89.19	–

Source: eMarketer, 2001; various, as noted, 2000

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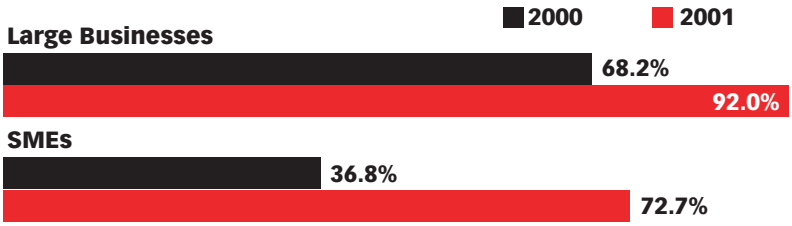
Business Internet Penetration

According to a Prince & Cooke survey, 86.8% of small and medium-sized enterprises (SMEs) have internet access. Other findings indicate that SMEs and large businesses are well represented online and are increasingly using the internet both for procurement and as a sales channel. Prince & Cooke predicts dramatic growth in the percentage of all Argentine businesses selling online by year-end 2001.

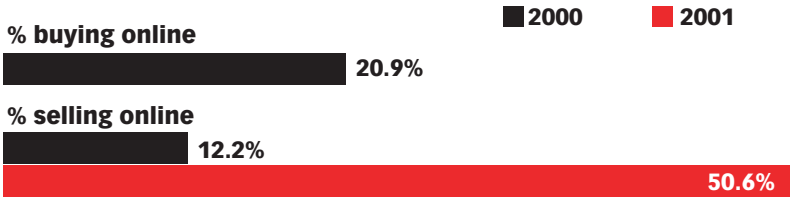
Meanwhile, InfoAmericas estimates that just over 80% of Argentine companies have a computer in their purchasing department and/or upper management. Approximately 70% of purchasing departments have internet access, but just over 10% have actual experience with e-procurement.

Argentine Businesses with a Website, 2000–2001



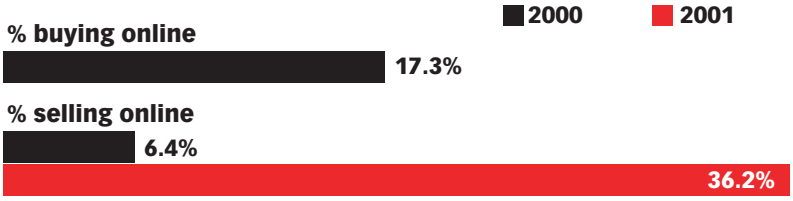
Source: Prince & Cooke, 2000

Large Businesses Transacting Online, 2000–2001



Source: Prince & Cooke, 2000

SMEs Transacting Online, 2000–2001



Source: Prince & Cooke, 2000

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C. Brazil

QuickStats: Brazil

Population	2000
Total Population (in Millions)[1]	172.9
Population 14+ (in Millions)[2]	126.1
Population Living in Urban Areas (1999)[3]	81%
Average GDP per Capita[4]	$3,674
PCs per 100 Inhabitants (1999)[5]	3.63
Main Telephone Lines per 100 Inhabitants (1999)[5]	14.87
Mobile Cellular Subscribers per 100 Inhabitants (1999)[5]	8.95
Internet Users (in Millions)[2]	3.9
Internet Users as % of Pop. 14+[2]	3.1%

Source: [1]US Census Bureau, 2001; [2]eMarketer, 2001; [3]World Bank, 2000; [4]International Monetary Fund (IMF), 2000; [5]International Telecommunication Union (ITU), 2000

Despite a relatively low per capita GDP (PPP) of $6,150, Brazil's highly unequal income distribution means that the wealthy have enough income to create a sizeable e-commerce market. Accordingly, e-commerce will grow from $2.47 billion in 2000 to $39.90 billion by 2003. Brazil's revenues in both the consumer and business segments are far and away the highest in Latin America, although the B2B sector will account for the majority of e-commerce revenues generated in Brazil.

With only 18% of the country holding credit cards, buying online is feasible only for a small (albeit wealthy) segment of the population. While prepaid debit cards and other mechanisms for transacting business online are in the process of being developed, they will not penetrate the population until two to three years down the road. In fact, a study conducted for DHL Worldwide Express among companies in 12 countries concluded that at 4.3%, Brazil had one of the lowest percentages of sales via the internet. Only Japan (at 1.1%) and Singapore (at 4%) produced lower results. By contrast, 20% of sales in Hong Kong took place over the internet, followed by 13.9% in the United States. On the other hand, the DHL study found that Brazil was among the most successful countries at converting site visits to sales: approximately 11% of visitors to Brazilian e-commerce sites actually made an online purchase. Only Finland and the United States showed slightly higher conversion rates and more significantly, the percentage of site visitors who bought online Brazil far exceeded that of Germany, the UK, and Japan.

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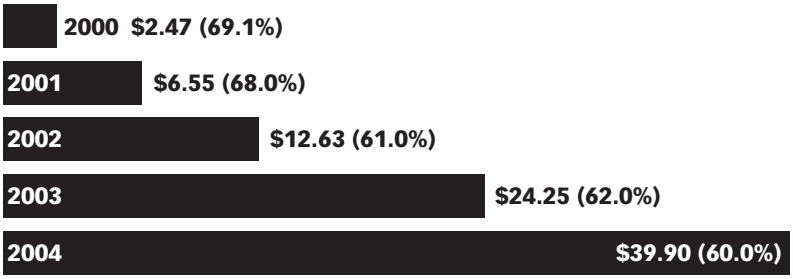
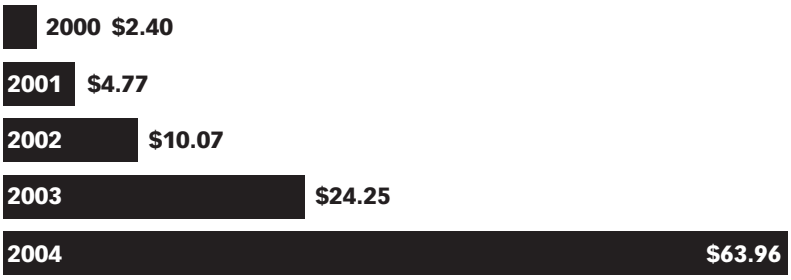
eCommerce Revenues in Brazil, 2000–2004 (in billions and as a % of total Latin American e-commerce)



Source: eMarketer, 2001

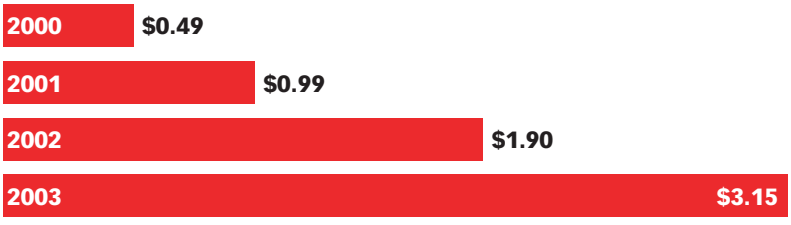
eMarketer and Forrester Research estimates show convergence through 2003, and then begin to diverge widely by 2004, as Brazil enters what Forrester sees as the country's period of hypergrowth. Morgan Stanley Dean Witter and IDC forecasts show convergence at the lower end of the spectrum, but we believe they do not take into sufficient account the potential of the Brazilian market. As more analysts highlight the size and capacity for growth of Brazil's e-commerce markets, an increasing number of B2C and B2B e-commerce firms will be compelled to focus their strategies on Brazil, and this, in turn, should drive up revenues.

eCommerce Revenues in Brazil, 2000–2004 (in billions)



Source: Forrester Research, 2000

eCommerce Revenues in Brazil, 2000–2003 (in billions)



Source: Morgan Stanley Dean Witter, 2001

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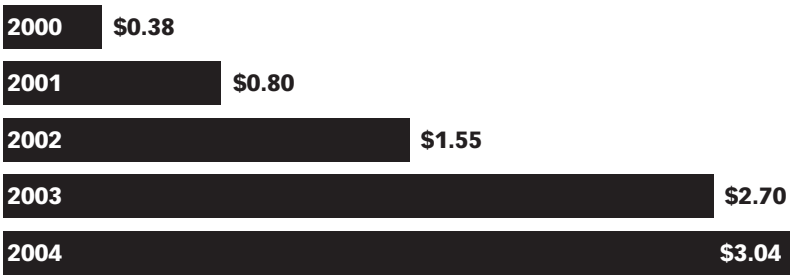
eCommerce Revenues in Brazil, 2000–2004 (in billions)

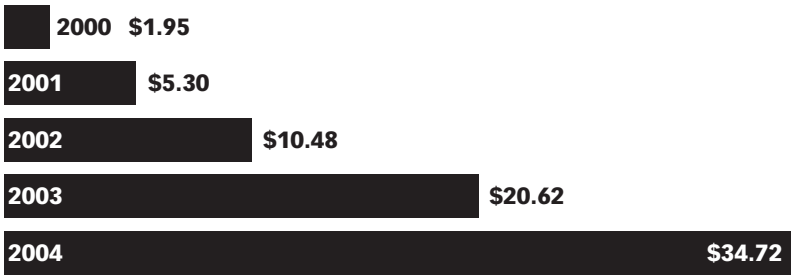


Source: International Data Corp. (IDC) and Banco Santander Central Hispano (BSCH), 2000

B2B eCommerce

eMarketer and Forrester Research estimates show convergence through 2003, and then begin to diverge widely by 2004, as Brazil enters its period of hyper-growth.

B2B eCommerce Revenues in Brazil, 2000–2004 (in billions)



Source: eMarketer, 2001

Other estimates diverge greatly, with Computer Economics the outlier of the group and Morgan Stanley Dean Witter coming in at the low end of the spectrum. Assessments of Brazil's potential, which vary widely from extreme optimism to deep pessimism, in part account for this divergence. Cautious optimism is warranted given that Brazilian companies still have to take considerable steps to bring their operations online. eMarketer believes that the pace of this process will intensify as firms realize the cost savings and increased margins that they stand to achieve.

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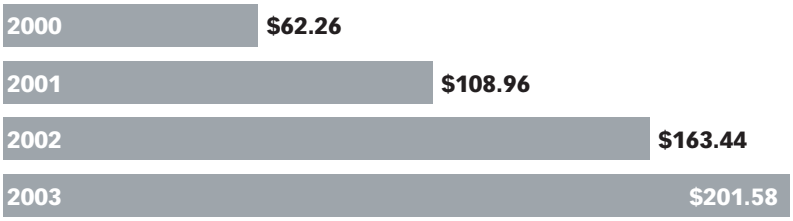
Comparative Estimates

B2B eCommerce Revenues in Brazil, 2000–2003 (in billions)

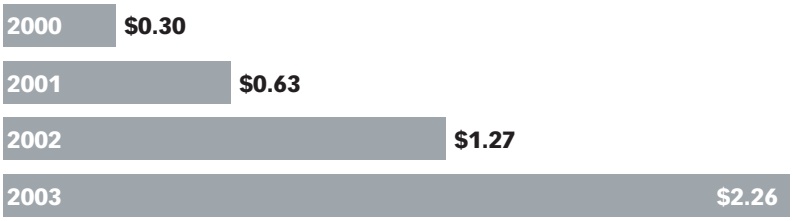


Source: Computer Economics, 2000

B2B eCommerce Revenues in Brazil, 2000–2004 (in billions)

Source: Forrester Research, 2000

B2B eCommerce Revenues in Brazil, 2000–2003 (in billions)



Source: Morgan Stanley Dean Witter, 2000

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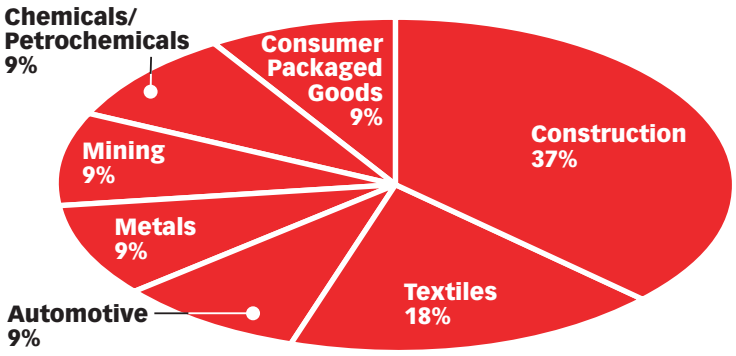
Top B2B eCommerce Industries

According to Symnetics, a Brazilian consultancy, sales of industrial products constitute the bulk (or 70%) of the B2B market, while services, including MRO (Maintenance, Resources, and Operations) and logistics account for approximately 30% of B2B transactions. The exact size of the market for industrial products is difficult to estimate, given that many B2B firms are still privately held. However, Symnetics research has found that 37% of B2B portals in Brazil serve the construction industry, 18% are dedicated to textiles and the remaining 45% are split evenly among the automotive, metals, mining, chemicals, and consumer packaged goods industries. While not an exact portrait, this breakdown at least provides an outline of the overall B2B market, as the concentration of portals presumably represents opportunities for online procurement systems.

Distribution of Industrial B2B Portals by Industry, 2000



Source: Symnetics, 2000

Business Internet Penetration

InfoAmericas estimates that approximately 90% of Brazilian companies have a computer in their purchasing department and/or upper management. Just over 60% of purchasing departments have internet access, but under 20% have actual experience with e-procurement.

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Logistics and Supply Chain Management

Supply chain logistics remain the major challenge to Brazilian e-tailers in both the B2C and B2B sectors, particularly because the supply chain is fragmented and disorganized. In this respect, traditional retailers have an advantage because they already have experience dealing with suppliers. Ebusinessforum.com estimates that only 15 suppliers in Brazil (two of which are Brazilian while the remaining are multinational firms) are capable of "cross-docking"—a precise logistical process that allows the retailer to avoid maintaining inventory. Thus, to insulate themselves from disrupting their offline operations and to streamline procurement processes, retailers like the Pão de Açucar supermarket chain are building dedicated local and regional distribution warehouses. They are also in the process of integrating their supplier network in proprietary or third-party ventures or online consortia (often joining with other large international chains in their same market segment).

The fragmentation of the supply chain also means that there is considerable opportunity in developing vertical portals that effectively integrate different elements of the supply chain. The automotive industry (particularly Volkswagen) has been successful in building e-procurement systems and mechanisms for purchasing cars online. Supermarket chains have also been very active in this sector.

D. Mexico

QuickStats: Mexico

Population	2000
Total Population (in Millions)[1]	100.4
Population 14+ (in Millions)[2]	68.6
Population Living in Urban Areas (1999)[3]	74%
Average GDP per Capita[4]	$5,452
PCs per 100 Inhabitants (1999)[5]	4.42
Main Telephone Lines per 100 Inhabitants (1999)[5]	11.22
Mobile Cellular Subscribers per 100 Inhabitants (1999)[5]	7.94
Internet Users (in Millions)[2]	1.5
Internet Users as % of Pop. 14+[2]	2.2%

Source: [1]US Census Bureau, 2000; [2]eMarketer, 2001; [3]World Bank, 2000; [4]International Monetary Fund (IMF), 2000; [5]International Telecommunication Union (ITU), 2000

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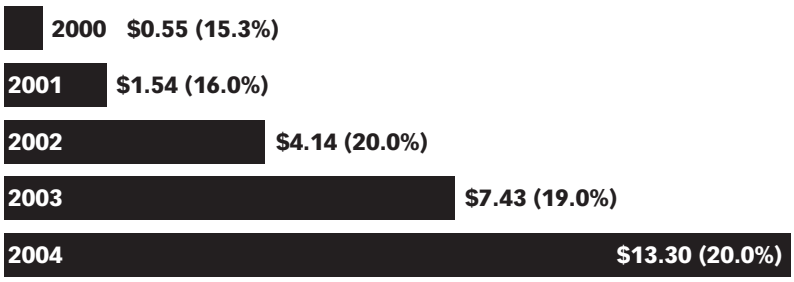
eCommerce

In the near term, Mexico's underdeveloped infrastructure should keep e-commerce revenues modest. Online merchants will have to work to overcome Mexicans' reluctance to buy products over the internet, and they must continue to offer a variety of payment options until a greater portion of the population has a credit card or other forms of e-money. Telmex's near monopoly on telecommunications service will also hamper e-commerce growth in both the B2C and B2B segments, at least until 2001-2002, when massive investments in infrastructure upgrades begin to bear fruit.

eCommerce Revenues in Mexico, 2000–2004 (in billions and as a % of total Latin American e-commerce)



Source: eMarketer, 2001

The range of e-commerce estimates for Mexico is broad, from the $270 million forecast by Morgan Stanley Dean Witter to the $3.25 billion predicted by Forrester Research for 2000. As Mexico reaches its period of hypergrowth in 2003 (the first country in Latin America to do so, according to Forrester), e-commerce revenues will spike upwards to more than $107 billion in 2004. In this context, eMarketer's estimates fall toward the middle of the pack.

eCommerce Revenues in Mexico, 2000–2004 (in billions)

Source: Forrester Research, 2000

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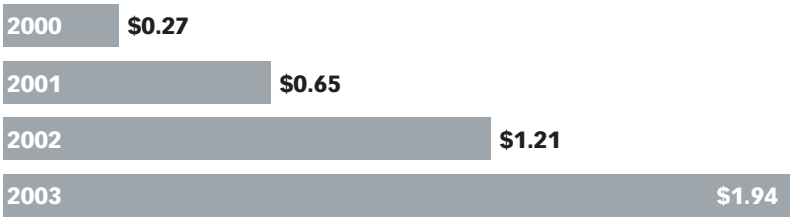
eCommerce Revenues in Mexico, 2000–2003 (in billions)

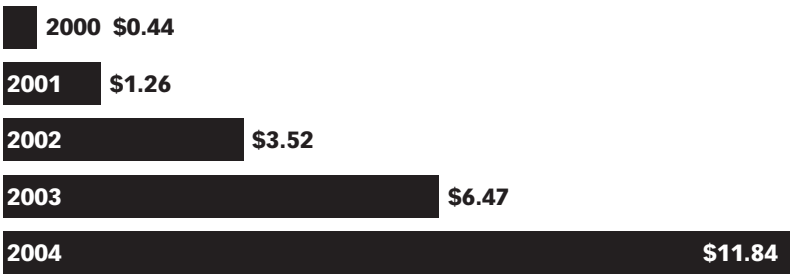


Source: Morgan Stanley Dean Witter, 2000

B2B eCommerce

The large number of US firms operating in or doing business with Mexican industry bodes well for e-commerce, particularly in the B2B sector. Mexico's assembly industry, particularly in the automotive and electronics segments, is closely integrated with US and Asian supply operations that do much of their procurement online. As other global components of the supply chain become digitized, the Mexican divisions have been compelled to follow suit. In any case, making e-commerce work well in a country like Mexico requires overcoming serious obstacles. Antiquated back office computer systems, inefficient distribution networks, and pervasive credit card fraud are enough to dissuade even the most ambitious entrepreneurs from moving their businesses online.

B2B eCommerce Revenues in Mexico, 2000–2004 (in billions)



Source: eMarketer, 2001

As with Brazil, assessments of Mexico's potential for B2B e-commerce vary widely, with some remarkably optimistic and others tending to be quite pessimistic. This lack of consensus in part accounts for the divergence in B2B e-commerce forecasts. Indeed, Mexico's proximity to and strong ties with US markets may in part account for why firms such as Forrester predict greater B2B revenues in Mexico than even in Brazil, which is generally considered the economic powerhouse of Latin America.

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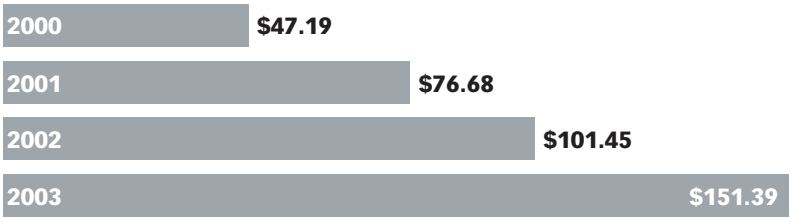
Cautious optimism is warranted given that Mexican companies are among the pioneers in building digital exchanges and marketplaces and are both well-positioned and sufficiently capitalized to help make e-procurement a reality, in Mexico as well as across the region.

B2B eCommerce Revenues in Mexico, 2000–2003 (in billions)

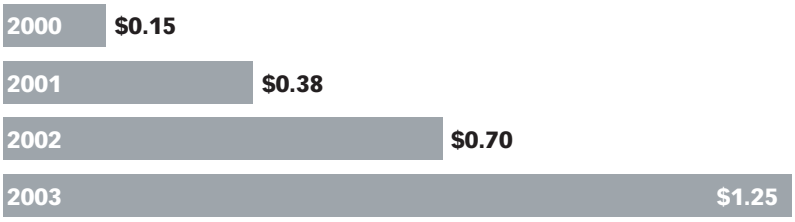


Source: Computer Economics, 2000

B2B eCommerce Revenues in Mexico, 2000–2004 (in billions)

Source: Forrester Research, 2000

B2B eCommerce Revenues in Mexico, 2000–2003 (in billions)



Source: Morgan Stanley Dean Witter, 2000

Business Internet Penetration

InfoAmericas estimates that around 85% of Mexican companies have a computer in their purchasing department and/or upper management. Just under 80% of purchasing departments have internet access, but only 20% have actual experience with e-procurement.

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Marketplaces, Auctions, and Exchanges

Cementos Mexicanos (Cemex), the world's third-largest cement company, is expanding its integrated global operations with new vertical procurement portals. It is building on its strength in the construction business by launching ConstruMix portals in major markets around the world. The sites will bring together suppliers of a full range of materials with end users in the architectural, design, construction, and contracting business. Cemex has also joined with Grupo Industrial Alfa, another Mexican conglomerate, Brazilian cement maker Votorantim, and Bradespar, Banco Bradesco's non-financial arm, to form Latinexus, a Latin-wide e-marketplace for indirect goods.

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Introduction

Compared to the year 2000, which was a time when businesses began to learn as much as they could about B2B e-commerce, the year 2001 will see a broader segment of the general business population begin to implement its e-commerce strategies.

For many businesses, internet activity up to the present has been centered primarily around the development of a marketing-focused website. While some companies are indeed trading online, Merrill Lynch has estimated that only 8% to 10% of the leading Global 5,000 companies have implemented e-procurement software. Most of this online procurement has been relegated to indirect procurement goods, and for many companies e-commerce has accounted for only a small portion of commercial activity.

And although there seem to be thousands of companies that are readying themselves to purchase online, the majority of vendors – by some estimates as much as 85% of potential online sellers – are not yet able to sell their products via the internet.

For those firms that have not jumped into e-commerce with two feet, the year 2000 was a time for developing their internet strategies. In 2001, North America, Europe, and some Asian countries will accelerate rapidly toward execution. By year's end, there will be a significant increase in the number of firms buying, selling, and communicating online.

Much of the survey data below shows how the leaders of internet commerce have already begun to implement their internet strategies. The collective data is therefore helpful in revealing the long-term patterns of e-commerce activity that are beginning to emerge.

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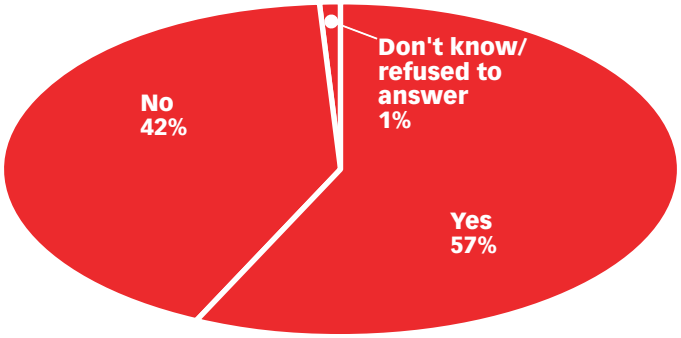
A. How the Internet Affects Business Strategy

In its survey of 251 CEOs from 26 different countries, A.T. Kearney found that the internet has become a significant element of business planning during the past year. This has been especially true for North American and Asian companies.

CEO Survey: Respondents Who Agree The Internet Has Changed Company Business, 2000



Source: A.T. Kearney, 2000

CEOs Who Agree That the Internet Has Fundamentally Changed the Way Companies Do Business, 2000

Source: AT Kearney, 2000

Survey data from KPMG support the finding that business leaders believe that e-commerce activity will have an impact on company business, with a significant 30% of respondents saying that it will change the definition of a company's core business. The weighting for this survey, however, includes data from three industries in which e-commerce activity is especially strong.

Executives Who Believe eBusiness Will Change the Definition of Company's Core Business, 2000

Source: KPMG, 2000

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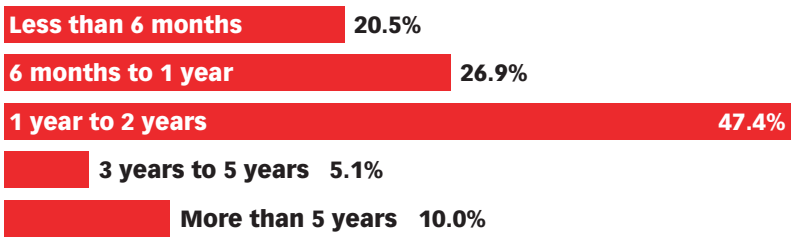
But despite this acknowledgement of the significance of the internet, CEOs almost unanimously do not see their company's e-commerce strategy as having a significant impact on the success of their business in the short term. Only 1% of survey respondents saw e-commerce as critical to their company's success at present, and just 5% believed it would be critical over the next three years.

Roland Berger surveyed more than 100 senior executives in the US consumer goods industry, an industry that was forced to look at e-commerce issues earlier than most others, due to the rise of business-to-consumer dot-coms. Because firms in this industry have a jump-start on their B2C and B2B e-commerce strategies, they may be considered an indicator of things to come.

Consumer Goods Executives: When eCommerce Initiatives Are Expected to Have a Measurable Impact on Bottom Line, as of June 2000



Source: Roland Berger, 2000

Despite their slight lead in e-commerce adoption, almost 50% of retail industry firms did not expect to see their internet strategies offer any measurable impact on their company bottom line until mid-2001 and into 2002. As brick and mortar companies have begun to drive internet commerce, short-term panic has been substituted by long-term perspective.

The myth of first mover advantage has been replaced in business-to-business e-commerce by the common sense wisdom that companies should instead focus upon getting their e-commerce strategies right.

In the past, ad-hoc internet strategies were formerly run by corporate marketing or IT departments. However, because of the undeniable impact of the internet on business over the long term, many executives have brought their companies' e-commerce operations under the guidance of top management. The decline of the dot-coms has not meant the demise of business competitors who are looking to use the internet to their advantage.

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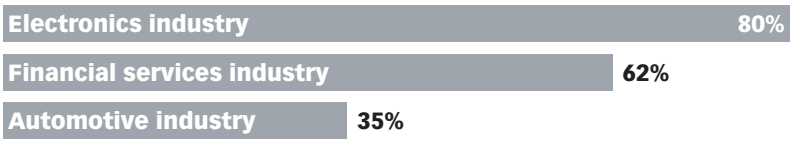
Company Survey: Who Guides eBusiness Strategy, 2000

Source: KPMG, 2000

Although CEOs have rapidly brushed up on internet-related technologies, Fortune magazine found that many of these business leaders were less comfortable with back-end technology issues such as routers or data service providers. KPMG's survey of global firms found that more than half of respondents believed that they should dedicate a full-time senior level manager for e-business initiatives, with this high-level attention particularly relevant in the electronics and financial services industries.

Senior Management Involvment in eBusiness Strategy by Industry, 2000



Source: KPMG, 2000

A PricewaterhouseCoopers survey of CEOs found that an astounding 69% feared that they didn't think things through, prior to embarking upon their e-commerce initiatives, while 34% worried that their efforts would fail. Supporting this sense of confusion, Forrester Research discovered that among the 50 CEOs it surveyed, 43% said that the lack of objective data and e-business hype required that they make investment decisions based upon soft, qualitative information.

When it comes to executing on internet initiatives, General Management Technologies (GMT) found that by the last half of 2000 81% of companies had had an e-commerce strategy for less than two years. The vast majority of firms, 84%, claimed some degree of success with these initiatives, with the remaining 16% claiming neutral results.

In terms of priorities, *Infoworld* magazine found that among its readership of technology leaders, 80% of firms placed their company's e-business operations at minimum, on a level of high priority for their company.

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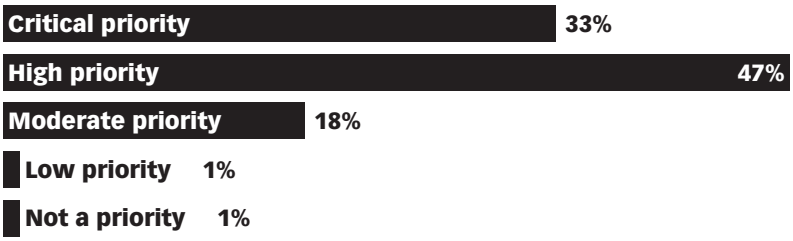
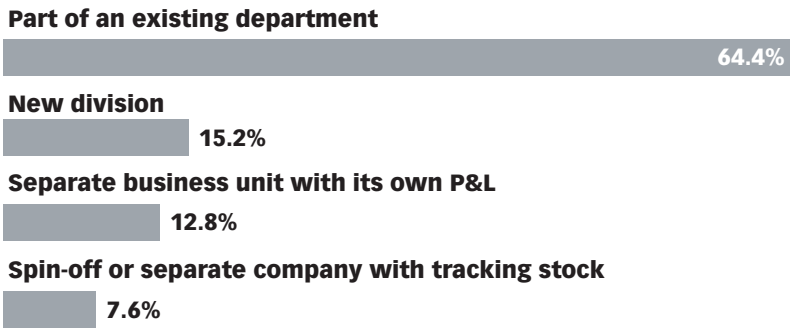
Technology Proffessionals: Priority Level of eBusiness Initiatives, 2000



Source: Infoworld, 2000

When it comes to organizing the strategic group responsible for e-commerce initiatives, most companies have found that their e-commerce units have grown out of an existing department. However, as e-commerce has evolved, the trend has been for executive management to oversee the coordination of internet strategies across multiple departments, often with a single executive placed in charge of all e-commerce activity.

Company Survey: Organizational Structure for eCommerce Activities, June 2000



Source: Roland Berger, 2000

Roland Berger found that 12.8% of retail industry companies had begun a separate business unit for e-commerce, with a further 7.6% spinning off a separate company with its own tracking stock. By comparison, 25% of firms had spun off their own e-business units, according to a GMT survey. One of the study's major conclusions was that e-commerce success was directly attributable to the involvement and support of executive management.

Because of the need to coordinate both sales and purchasing operations as part of an integrated internet strategy, several companies have created multi-departmental e-commerce committees. As to where companies are implementing their e-commerce strategies within their organizations, *Infoworld* has confirmed that the majority was deploying them broadly throughout their companies.

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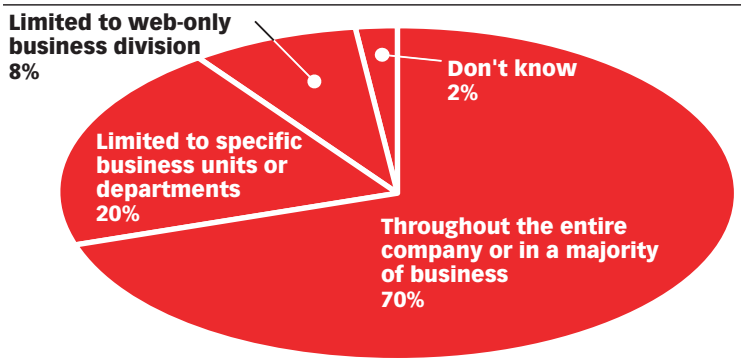
Where Companies Deploy Their eBusiness Initiatives, 2000



Source: Infoworld, 2000

In a survey of global companies conducted in 1999, PricewaterhouseCoopers discovered that while many large firms had a limited internet presence, their e-commerce capabilities provided them with a foundation upon which they could build an internet strategy. Most companies had so-called brochureware websites and some marketing information on the internet, but they had not yet begun to actively conduct transactions online.

eCommerce Capabilities Among Large, Global Firms, 2000

Source: PricewaterhouseCoopers, 2000

Research by Andersen Consulting in late 2000 supported the findings of PricewaterhouseCoopers, confirming that top level executives still emphasized marketing as one of the most important elements of their e-business strategies.

But as the year 2000 progressed, there was a clear trend that saw businesses take steps toward expanding their internet initiatives in general. *Interactive Week* showed that among its technology industry readership, companies were increasing the percentage of staff devoted to internet activities, rising from an average 21% in 1999 to 32% in 2000.

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Company Survey: Percent of Staff Devoted to Internet Activities, 1999 & 2000

Source: Interactive Week, 2000

During the spring of 2000, the National Association of Business Economics found that more than two-thirds of its members were addressing e-commerce within their companies by planning to make significant process or organizational changes of some kind.

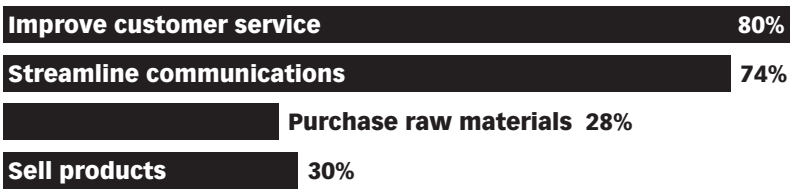
How Companies Are Responding to eCommerce, 2000

Source: National Association of Business Economics, April 2000

In survey after survey, there is a repeated emphasis on customer service as the top priority for internet strategies. The Gartner Group is projecting that customer relationship management (CRM) applications and enhanced website services will be implemented by an increasing number of businesses over the course of 2001.

By prioritizing online customer service, many companies have taken a page from the success stories of e-commerce leaders Cisco and Intel, whose benchmark B2B websites evolved out of customer-focused innovations that were built around internet technology.

How Companies are Using Their eCommerce Strategies, 2000



Source: General Management Technologies, 2000

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At the beginning of 2000, PricewaterhouseCoopers announced that, although 96.3% of large companies had a brochureware website, only 40.3% had the ability to take orders online. Just 34.2% offered customers some kind of web-based post-sales support, while 28.2% of businesses permitted payment to be made via their website.

But by mid-2000, Arthur Andersen's survey of businesses' e-commerce strategic planning found that most firms were expecting to have implemented online sales and marketing, product distribution, and customer relationship management by the end of 2000. The respondents to this survey may have been ambitious with their expectations for the year, however, although they do provide a useful sense of e-commerce priorities.

Percent of Firms That Have Adopted or Already Implemented Web-Enablement Strategies by Year-End 2000

Source: Arthur Andersen, 2000

Industry Week's survey of over 2,100 executives offers a significant sample group for comparing e-commerce planning activity in mid-2000. Many of the survey respondents were from the manufacturing industry, explaining the high percentage of firms listing information exchange for engineering and technical data as part of their e-commerce strategies.

Despite this manufacturing sector bias, more than 50% of the companies surveyed planned to be buying online by the end of 2000, with online customer service listed among the top five e-commerce initiatives that they expected would be implemented by year's end.

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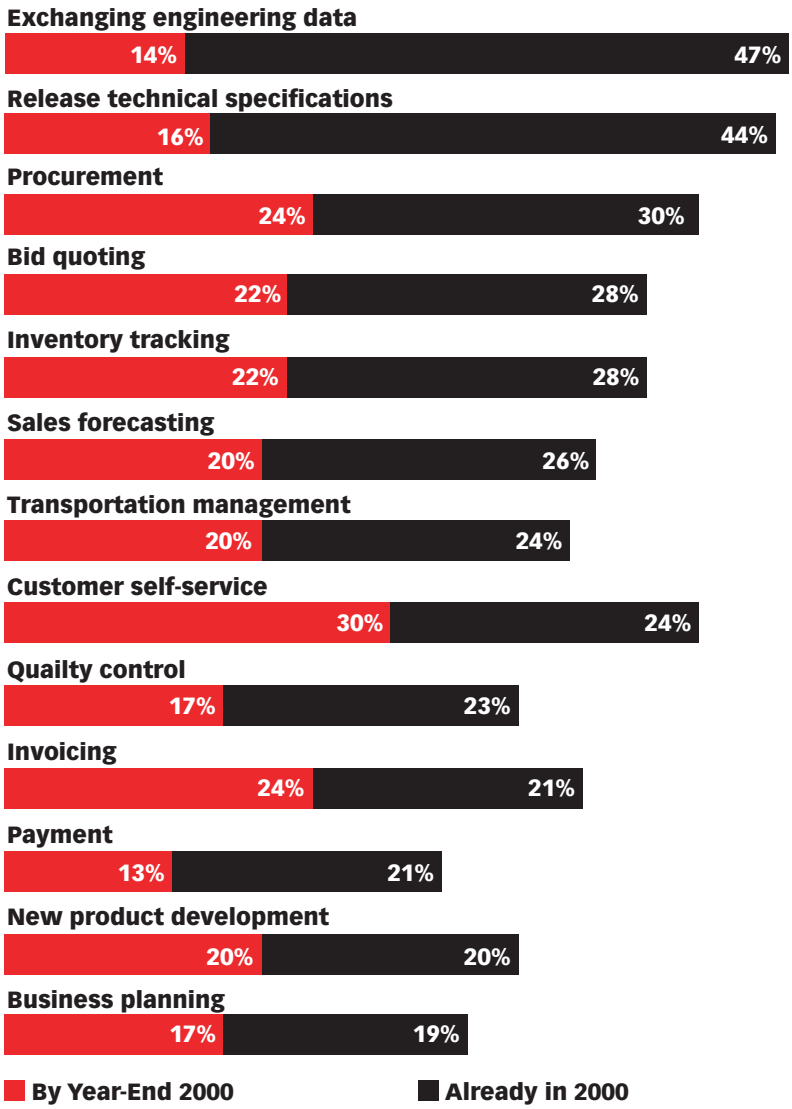
Percent of US Companies Conducting eBusiness, 2000 (by activity)



Source: Industry Week, 2000

While there is a strong trend toward the use of the internet to strengthen business-to-business relationships between trading partners, there is also a need to integrate e-commerce technologies within companies. Survey data from A.T. Kearney confirms that large corporations have placed a high priority on using the internet to improve their customer relationships, but that the adoption of new technology must first be integrated with established business processes. This need to "get it right" has slowed many companies' implementation plans, as several businesses are choosing to re-examine their offline business procedures before they invest in new technologies.

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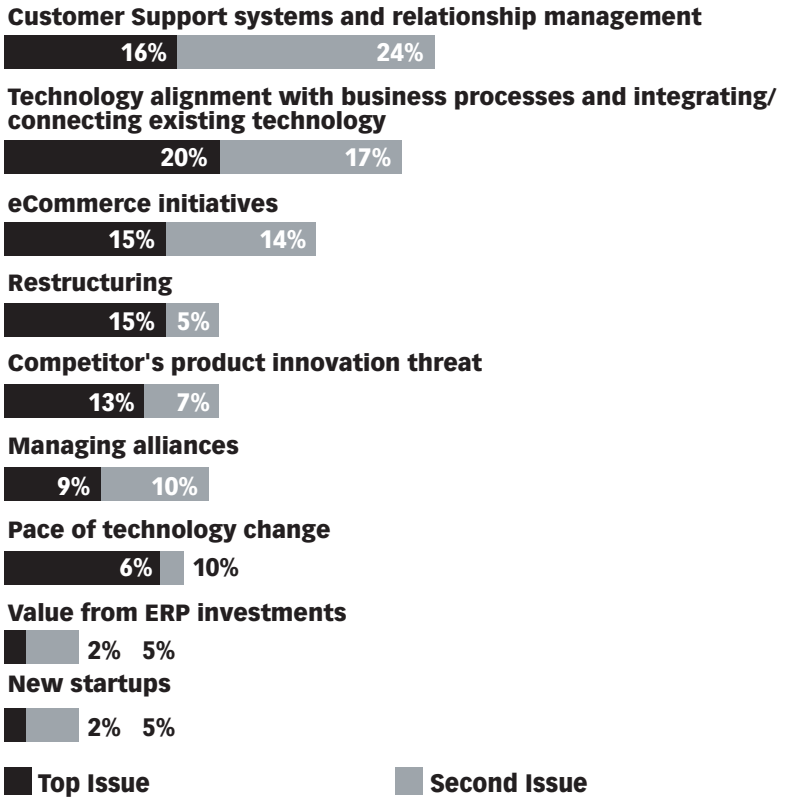
Top Business Issues Facing Large Corporations, 2000



Source: At Kearney, 2000

Once again, when asked how e-commerce is expected to improve business practices, the first response of business leaders is one that emphasizes their customers. The improvement of internal efficiencies is also a top objective of many firms, as companies are expecting new technology to deliver efficiency gains in their operating margins thanks to the streamlining of internal processes. Achieving lower prices through online purchasing channels is an objective as well, but it is lower on the list of expectations.

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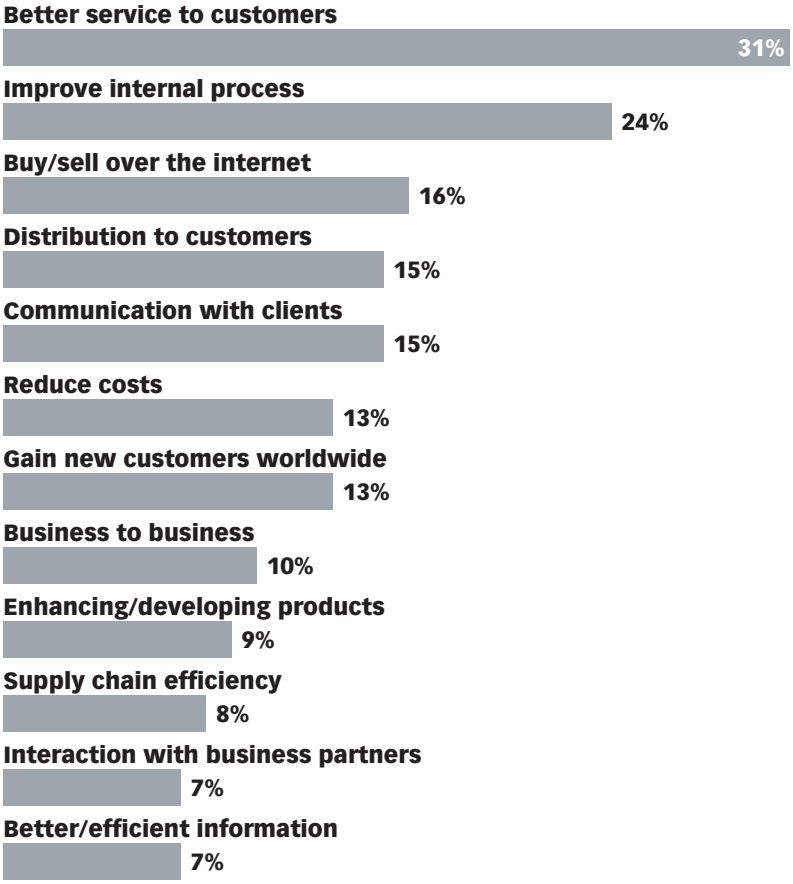
Executive Survey: How eBusiness Can Improve Future Business Practices, 2000



Source: AT Kearney, 2000

For many executives one of the greatest opportunities provided by the internet is centered around the gathering of data, in particular the way data pertains to their relationships with their clients and suppliers.

In addition to the strengthening of customer relationships, the information flows that surround supplier relationships have led the internet to offer its greatest value through the long-term improvement of business-to-business communication. By streamlining the supply chain, reducing paperwork, and coordinating the flow of products between trading partners, web-based technologies associated with supply chain management provide firms with the greatest opportunity to reduce costs.

Businesses are implementing their e-commerce strategies on a gradual basis, with indirect procurement and customer-facing applications representing their first tentative steps.

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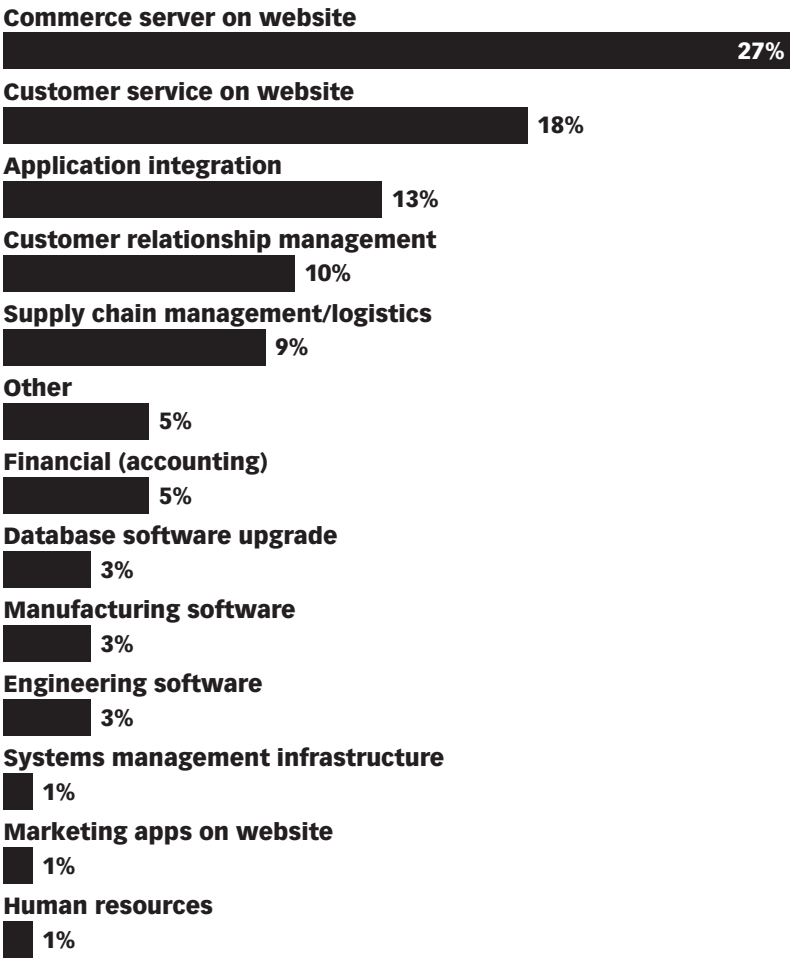
But because the technology behind supply chain management is much more costly and difficult to implement, this element of e-commerce strategy will realize a greater impact over the long term. As this part of the B2B story became evident over the course of last year, Arthur Andersen found that 61% of companies planned to use the internet to streamline supply chains over the next 12 months, starting in September 2000.

Morgan Stanley Dean Witter's survey of IT executives confirms that enhancing each company's e-commerce capabilities, with a particular focus upon transaction-based applications, is a priority for most businesses. As can be expected, customer relationship management has become closely integrated with enabling broader e-commerce capabilities.

Top Strategic Software Projects for the Next Year, June 2000



Source: Morgan Stanley Dean Witter Research, 2000

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In measuring their overall progress with e-commerce implementations, just over one half of the companies in the Morgan Stanley survey had one to five application development projects under way as of November 2000, with an additional 25% of companies having 6 to 15 projects on the go. These survey results provide a strong indication that e-commerce activity will be increasing significantly in 2001.

eCommerce Priorities Among Leading Companies, June 2000

Web site enablement
Customer relationship management/SFA
Customer self service
Procurement software to automate purchasing
Participating in an industry sponsored exchange
Order management over the web
Supply chain management
Channel relationship management
ERP upgrade
Auction services

Source: Morgan Stanley Dean Witter Research, 2000

Morgan Stanley went on to find that the slowing economic environment during the closing months of 2000 did not affect companies' intentions to spend on IT solutions. Of the 150 firms surveyed in November of 2000, 74% said that they had no intention of reducing their IT budgets.

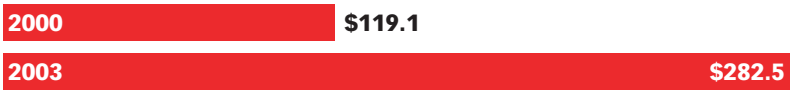
B. B2B eCommerce Budgeting

A.T. Kearney's global survey found that 68% of CEOs believed that technology is crucial to the future success of their companies, with 77% planning to increase information technology spending over the next three years.

In total, Jupiter Communications predicts that American companies will spend more than $350 billion on their internet infrastructures alone, by 2003.

By comparison, International Data Corp. estimates that US company spending on IT products and services will rise from $119.1 billion in 2000 to $282.5 billion in 2003. Although software is the smallest section of the US IT market, it is expected to grow the fastest, at a CAGR of 43%, compared to an overall market CAGR of 35%.

US IT Spending Estimates, 2000 & 2003 (in billions)



Source: IDC, 2000

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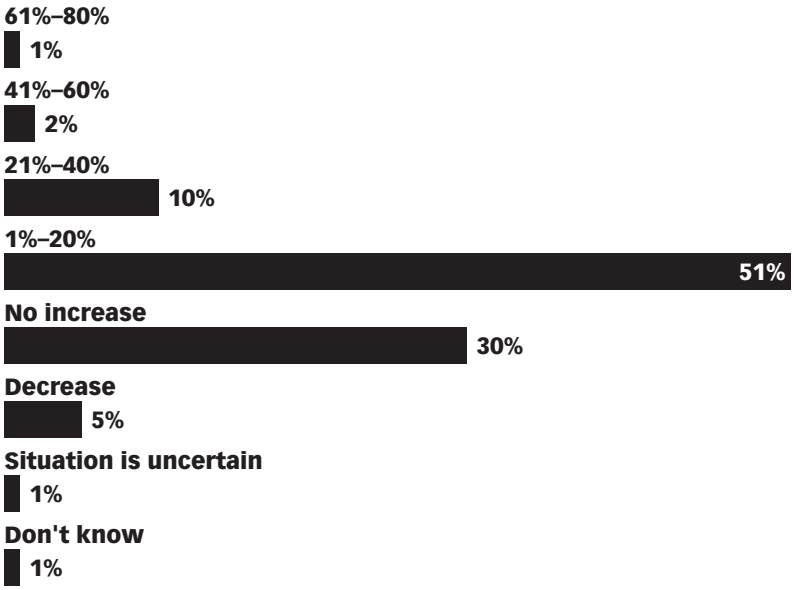
Forrester Research estimates that the packaged software market for e-commerce software will reach $14.5 billion by 2003, up from $7.8 billion in 2000.

In Morgan Stanley Dean Witter's survey of 150 CIOs, the investment bank found that most technology executives expected to increase their IT budgets going from 2000 into 2001, with a significant 30% maintaining IT spending at current levels. The majority expected to see their IT budgets rise by 1% to 20%.

12 Month Spending Forecast on IT Projects, July 2000



Source: Morgan Stanley Dean Witter Research, 2000

Categorizing B2B e-commerce as a subset of business technology spending, KPMG found that investing in relationships with business partners was the priority for global companies. Several respondents to the KPMG study believed that online exchanges would be the most effective means of helping them sell to new clients.

% of eBusiness Spending Going Toward B2B Initiatives, 2000 & 2002

Source: KPMG, 2000

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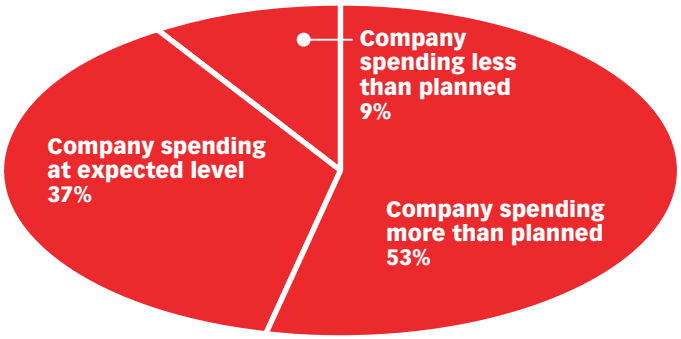
Taking the measure of spending on e-commerce strategy, eCommerce Business Research surveyed 250 businesses, two-thirds of which were brick-and-mortar companies, about their e-commerce budgeting activity during 2000 and into 2001. Well over half of survey respondents indicated that they were spending more on e-commerce than they had originally planned.

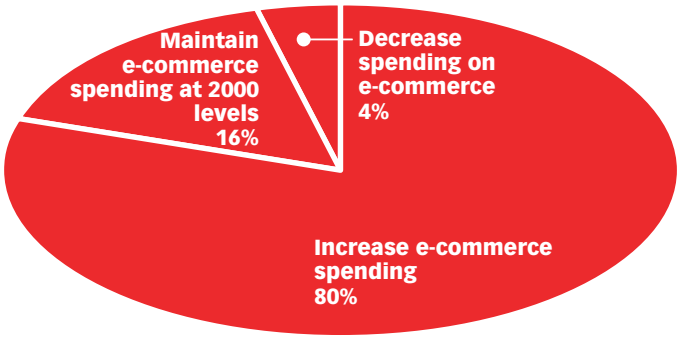
eCommerce Budget Changes, 2000



Source: eCommerce Business Research, 2000

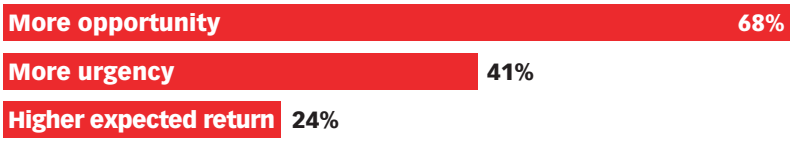
Looking forward into 2001, almost half of respondents to the survey said that they planned to increase their e-commerce budgets by 15% or more, while 36% planned to increase their budgets by 20% or more. Businesses have seen the potential savings and return on investment that they will obtain through their technology investments, and they clearly believe that the opportunity is worth the expense.

eCommerce Budget Plans for 2001



Source: eCommerce Business Research, 2000

Reasons for Increasing eCommerce Spending, 2000



Source: eCommerce Business Research, 2000

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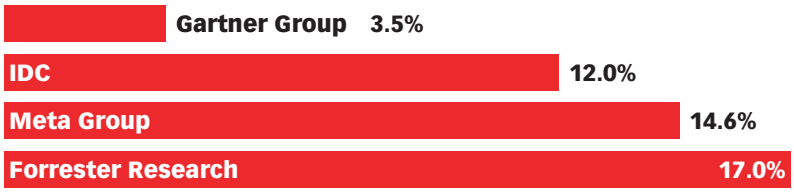
As a portion of IT budgets, e-commerce spending has become increasingly significant during the past year. By 2003, IDC predicts that spending on e-commerce will account for as much as 27% of IT budgets.

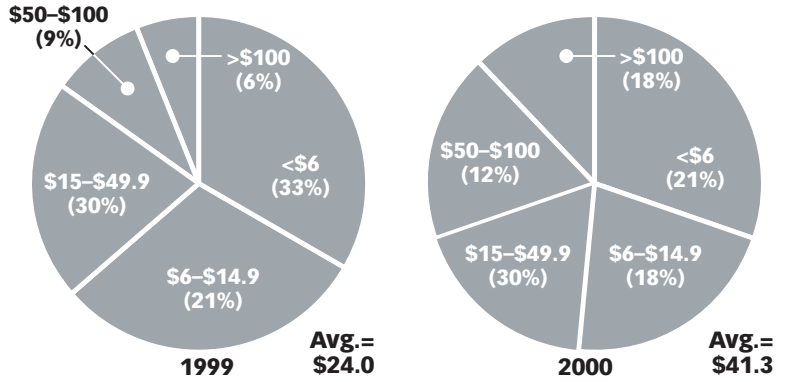
Comparative Estimates: eCommerce Spending as a % of IT Budgets, 2000 (in billions)



Source: various, as noted

In Forrester's research of large enterprises, a relatively small sample group of 33 interviewees reported that e-commerce budgets had grown significantly from 1999 to 2000. As a percent of total company revenues, the e-commerce estimates seem relatively small, at just 0.4% in 1999 and 0.7% in 2000. Once e-commerce operations have been established, Forrester expects the rise in e-commerce spending to slow, but still obtain a level of 1.0% of company revenues by 2003.

Average eCommerce Budgets Among Large Enterprises, 1999 & 2000 (in millions)



Source: Forrester Research, 2000

The Meta Group surveyed 357 US companies with revenues of more than $100 million. One of its most important findings was that the greater portion of e-commerce initiatives had been primarily customer-facing, with a significant shift toward supply-chain and inventory-related e-commerce investment expected in the coming year. Early e-commerce initiatives have been described as a "stop gap" measure by the Meta Group, primarily focused upon marketing and customer service.

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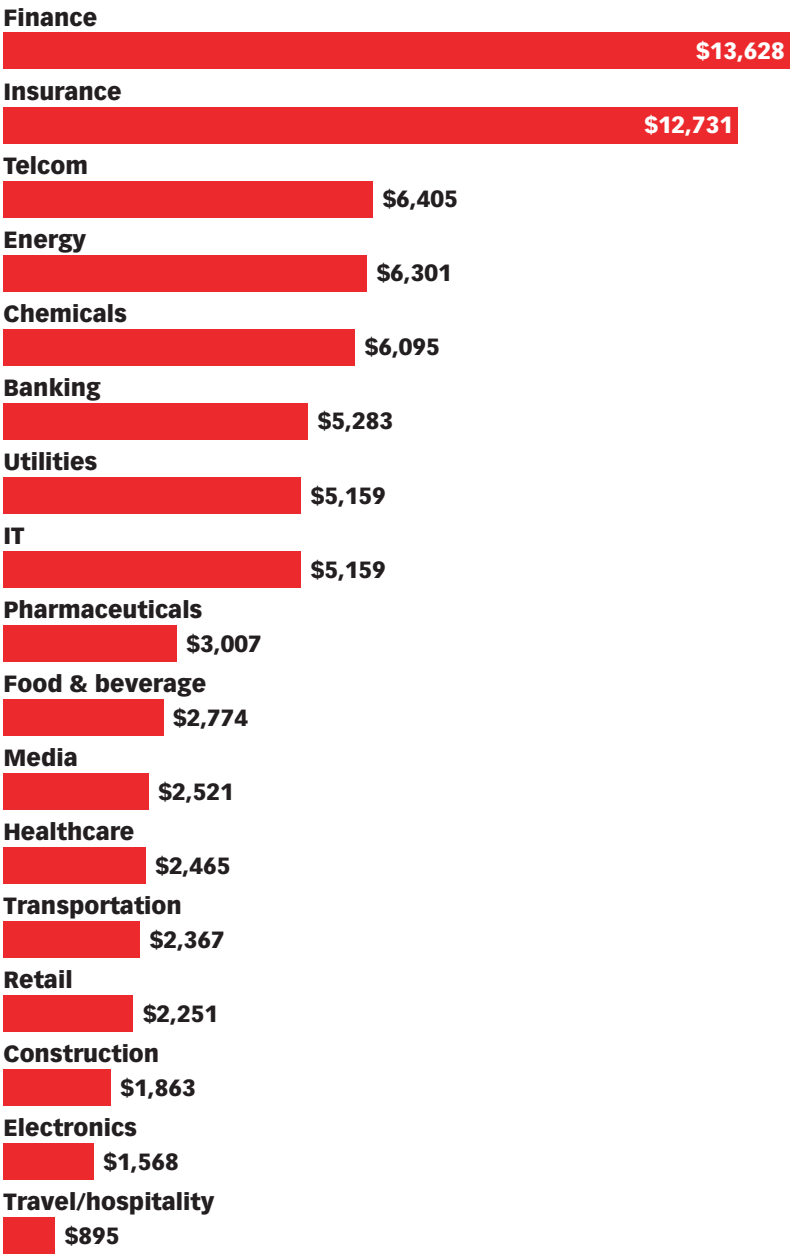
US Company Outlays for eCommerce, per Employee, 2000



Source: Meta Group, 2000

The customer-facing categories of e-commerce strategy, including marketing, customer service and direct sales are all scheduled to see a decline in spending priorities in 2001, according to the Meta Group. By contrast, supply chain management elements of e-commerce strategies will all become more important elements of firms' internet initiatives.

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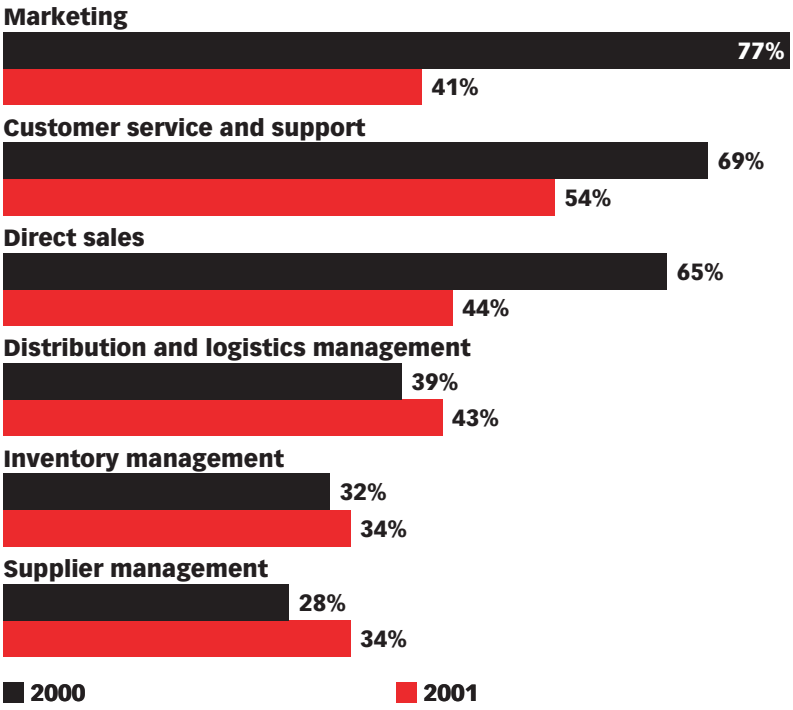
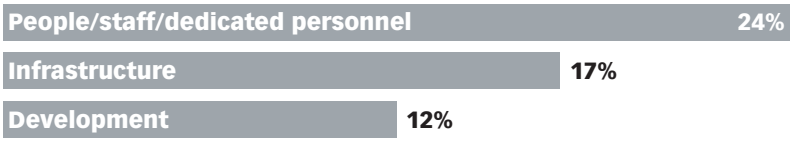
US corporate Spending on eCommerce by Corporate Category Priorities, 2000 & 2001



Source: Meta Group, 2000

US Corporate Investment Priorities, 2000 & 2001



Source: Meta Group, 2000

One interesting aspect of the Meta Group's findings was that e-commerce spending does not correlate with company size. Almost two-thirds, 65%, of companies were spending less than $1 million on e-commerce programs in 2000, with only 10% spending more than $5 million. By comparison, these numbers contrast with those of *Interactive Week*, although its sample group consists of companies that are primarily technology leaders.

Average Spending on Internet Technologies Among Technology Companies, 1999 & 2000 (in millions)

Source: Interactive Week, 2000

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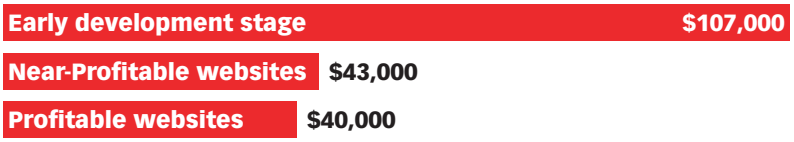
Forrester Research estimates that in the first year of website development, a purely promotional website will cost $300,000 for a large company. In the following year of establishing an internet presence, firms will spend as much as $3.4 million on a transactional website. This compares to IDC's estimate of $1.3 million to develop a transactional website.

ActivMedia's coverage of website spending found that firms with as many as three years of website experience spent less on maintaining and driving traffic to their websites than those firms that were new to the internet. Two-thirds of the 250 survey respondents were brick-and-mortar firms with a web presence.

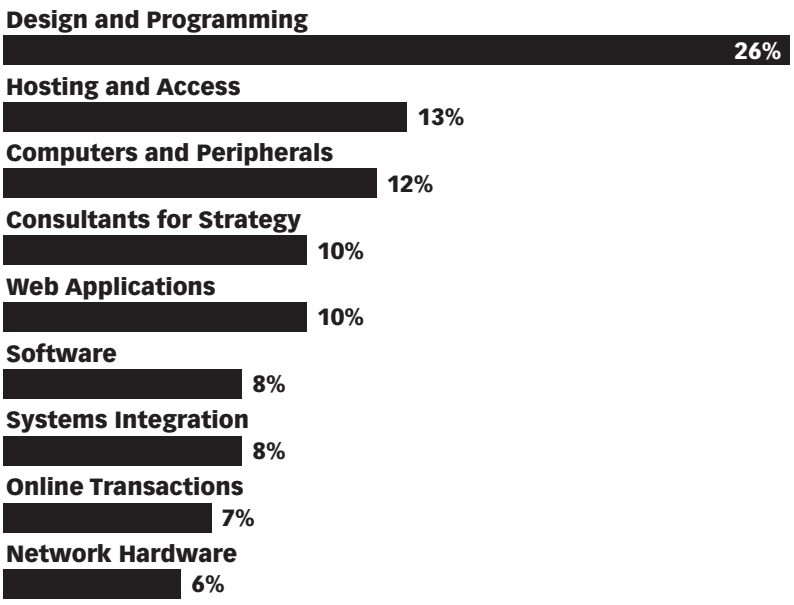
Average Website Spending, by Stage of Development, 2000



Source: ActivMedia, 2000

For those businesses that had developed a web presence, the greater part of the cost of going online was on the front end, with initial design and programming costs accounting for the largest part of the total. But once a website was up and running, the costs evened out over time.

Website Development Budget Allocation, 2000



Source: ActivMedia, 2000

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C. Implementing eCommerce Strategies

According to Commerce One, online exchanges and individual companies that have started to implement e-commerce strategies have begun to adopt them in a phase-by-phase roll-out. This gradual roll-out of e-commerce strategy typically begins with indirect procurement purchasing online, and then moves into more complex direct procurement transactions and supply chain management.

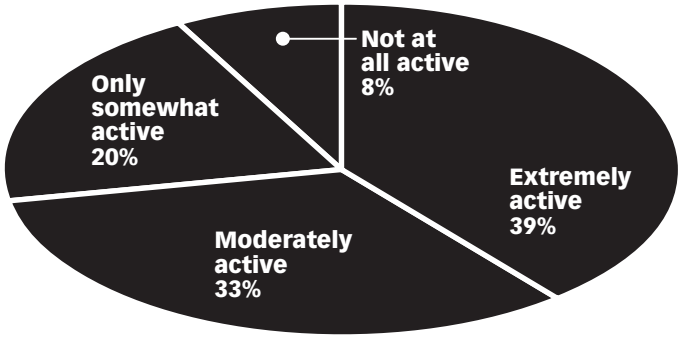
Stages of eCommerce Strategy

Indirect procurement
Direct procurement (includes sourcing and RFQ management)
Pre-Procurement (supply chain management, planning & forecasting)

Source:eCommerce Business Daily, Commerce One, 2000

Among large companies operating in North America, Europe, and Asia, A.T. Kearney found that many firms considered themselves to be actively engaged within a broad definition of e-commerce, with almost three-quarters claiming to at least be moderately active.

Level of eBusiness Activity, 2000



Source: AT Kearney, 2000

The use of the internet to open up a new direct sales channel was by far the number one change cited by most businesses that were engaged in e-commerce. As a measurement of the internet's impact on business, advantages gained through pricing or the increased speed of business processes were surprisingly low, however this is likely an indication of the relatively moderate level of e-commerce activity in which firms were engaged.

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Company Survey: How the Internet Has Changed Companies' Business, 2000

Source: AT Kearney, 2000

Infoworld magazine found that as of November 2000, well over 71% of the 100 companies that it considered to be technology leaders were already buying or selling online, with only 1% simply relying upon brochureware for their web presence. The survey included both brick-and-mortar companies as well as dot- coms, with just under one-quarter (23%) of the companies being consumer firms.

Company Survey: How the Internet Has Changed Company Business, 2000

Source: Infoworld, 2000

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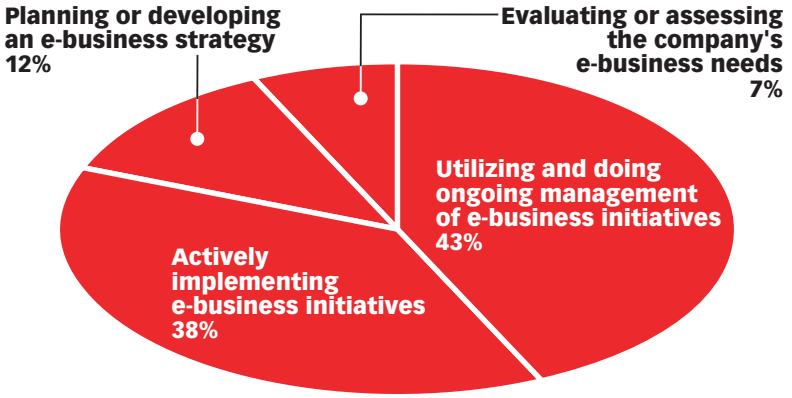
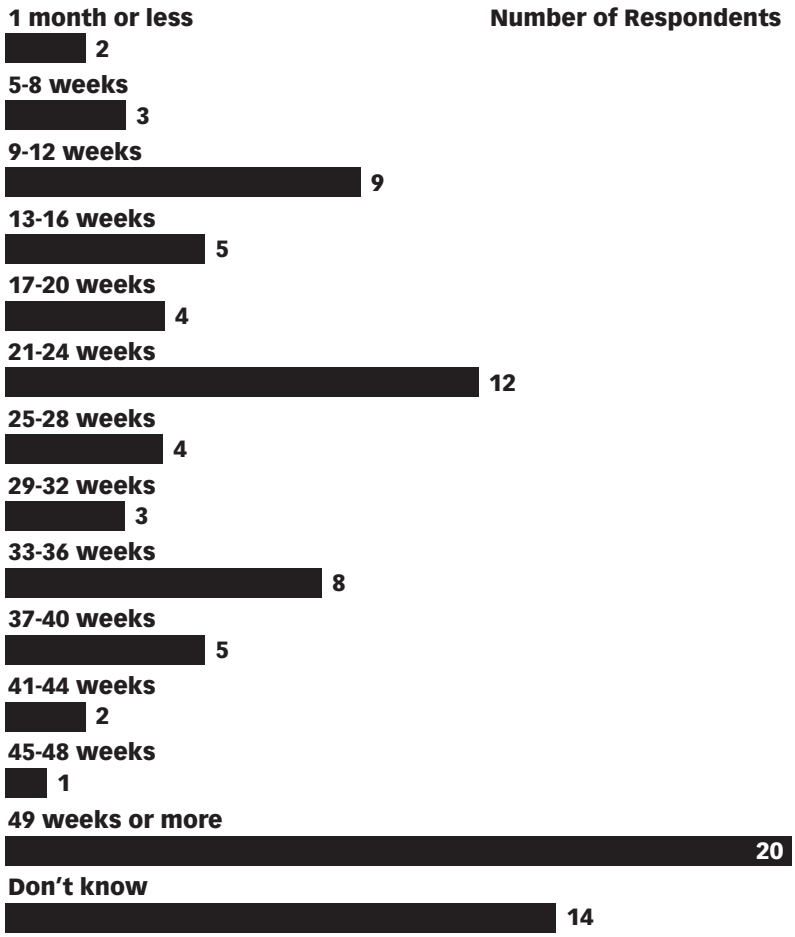
Infoworld found that most firms already had their e-business operations up and running, or in the implementation phase. The majority of implementations had taken between three and nine months to deploy.

Company Survey: Online Business Readiness, 2000



Source: Infoworld, 2000

Company Survey: Length of Time to Deploy Online Business Project, 2000



Source: Infoworld, 2000

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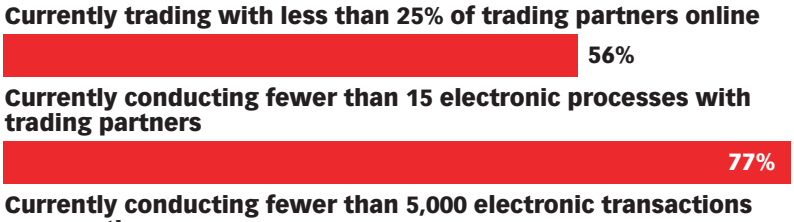
For the average business that does not consider itself a technology leader, the above numbers provide a general indication of where most companies may expect to be with their e-commerce strategies in the coming months. With survey data showing that most companies are moving from e-commerce strategy planning to technology evaluation, greater numbers of businesses may be expected to come online in the latter half of 2001.

A survey by e-commerce technology provider Edifecs found that companies were taking an average of 3.5 months to enable new electronic transaction processes with one single trading partner. The setup process included technology implementation, as well as employee training. Over 400 e-commerce managers were surveyed in the United States.

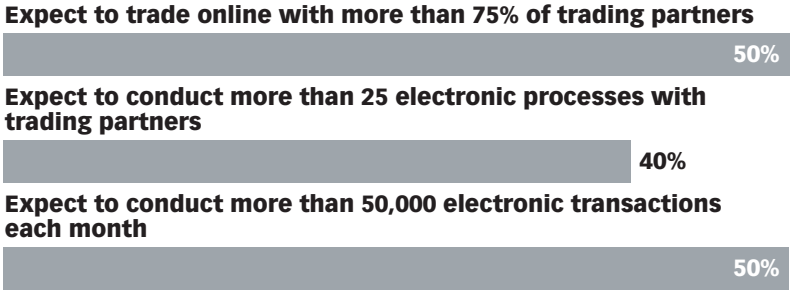
eCommerce activity was still limited as of September 2000, with 56% of companies trading with less than one-quarter of their trading partners online, and 45% of companies conducting fewer than 5,000 electronic transactions per month. Half of survey respondents expected to significantly increase the number of trading partners that they connected with online, with 50% of respondents also expecting to conduct more than 5,000 online transactions per month.

Companies Engaged in eCommerce with Trading Partners, September 2000



Source: Edifecs, 2000

Companies Planning To Engage in eCommerce with Trading Partners, 2000



Source: Edifecs, 2000

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Edifecs has broken down the process of implementing an electronic trading strategy with a company's trading partners. The longest part of most implementations focuses upon negotiating and establishing processes with trading partners. Presumably, this would become easier over time, as a template is established after the first effort.

The Three Stages of B2B Strategy Implementation

	Description	Time to Implement
Preparation	Laying the groundwork for a B2B strategy, including coordination with trading partners	188 person-days
Ramp-up	Five steps, including formalizing agreement with a trading partner, setting up internal systems, developing systems specifications for intercompany communication, testing the systems, and going live	95 person-days
Community Extension	Adding new partners to an established trading community	132 person-days

Source: Edifecs, 2000

The Delphi Group surveyed 600 IT and business managers in the last half of 2000, and found that while 90% of companies had e-business initiatives in place, only 31% could say that they had made a full transition to e-business.

Adopting and implementing an e-commerce strategy is clearly not a process that is accomplished at one time, but it is instead rolled out and evolved in multiple phases. This is due to the fact that e-commerce is not one process or strategy, but a multitude of business processes that need to be adapted to the internet.

While it is possible to take the pulse of the general business climate in any one country or industry, individual decisions are being made on a company-by-company and even department-by-department basis. From marketing to procurement to online sales, businesses are first prioritizing the various elements of e-commerce according to their needs, the available technology, and the cost as well as the associated return on investment.

When it comes time to select a technology provider, Roland Berger has found that among retail industry firms there is at present a strong preference by companies to stay with their own proprietary systems. But over time, "best of breed" solutions are expected to see the most significant increase in use, despite complications associated with integration. Single source or integrated systems vendors such as IBM or Oracle are projected to obtain a greater role in web-enabled e-commerce solutions as well, at the expense of proprietary solutions.

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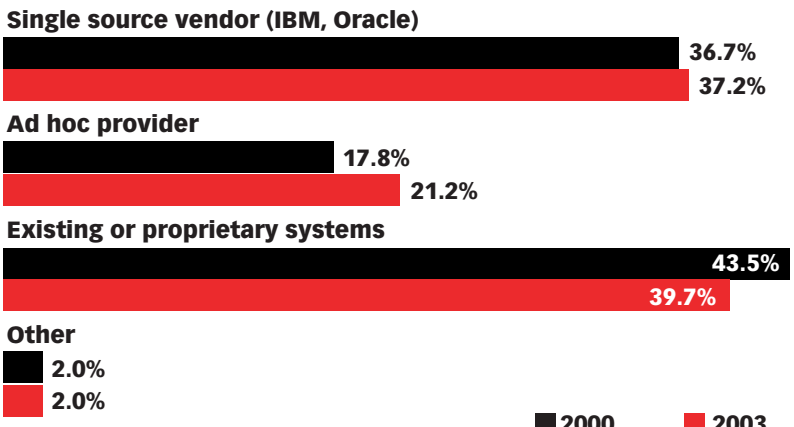
Information Technology Systems and Services for eCommerce Solutions, by Provider, 2000



Source: Roland Berger, 2000

In the future, the primary competition will be between single source versus best of breed vendors. The degree to which technology providers can create reliable, integrated solutions or partner with best of breed providers will have the most significant impact upon the timing of when firms will choose to abandon their proprietary systems.

As one of the most complex elements of e-commerce strategy, supply chain management (SCM) solutions are already on the agenda of many businesses. Companies have placed a priority upon real-time information about order status and production, as well as the various levels of integration that help buyers and sellers to coordinate their operations more closely and thereby reduce inefficiencies.

Online Collaboration Initiative Priorities for Buyers and Sellers, 2000

Source: Boston Consulting Group, 2000

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Web-based supply chain management represents what is perhaps the internet's broadest long-term impact on the evolution of business. With businesses building on the trend of outsourcing by following the internet-based trading model of companies like Cisco Systems, there will be an accelerated shift toward a divestiture of capital as companies will no longer need to own a supply chain in order to generate maximum efficiencies.

Thanks to the communications provided by the internet, collaboration between trading partners will permit business partners to not only maintain but improve on the level of coordination that was previously attained only within a single corporation's internally managed supply chain. Web-enabled technologies are permitting this industry-level coordination to occur.

In a study commissioned by Dell Computer, the University of Texas found that in the year 2000, one-quarter of the businesses that it surveyed were already communicating online with their suppliers. The various forms of SCM-related communication included inventory updates, incident reports, and product demand information.

Companies Using Software to Connect With Supply Chain Partners, 2000

Source: Dell Computer/University of Texas, 2000

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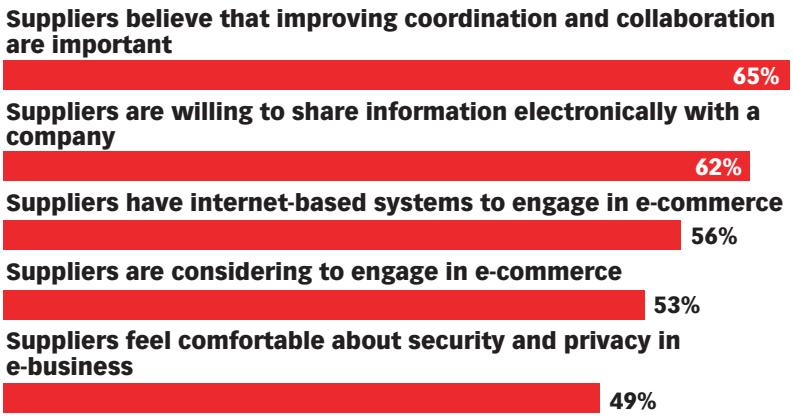
Among the most-often cited obstacles to e-commerce trade has been the lack of preparation among businesses' trading partners. In 1999, Goldman Sachs found that 45% of large companies' suppliers "just didn't get it" when it came to e-commerce. A great deal has changed since then, however. According to the University of Texas, well over half of the companies it surveyed were willing and interested to participate in e-commerce.

Supply Chain Partners Prepared for eCommerce, 2000

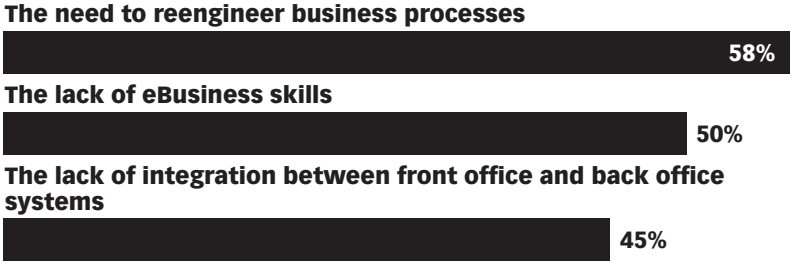


Source: Dell Computer/University of Texas, 2000

Following their embrace of the prescribed benefits of e-commerce, many businesses have found that the first step to implementation is to substantially rethink business processes. As a result, one of the major delays right now is a result of the need to take time to select and implement the right technology to connect trading partners.

This reengineering process has been particularly difficult for mid-sized companies that are faced with significant implementation challenges due to their size, coupled with substantial expenses that hit them harder than their large, corporate trading partners.

Company Survey: Greatest Barriers to the Implementation of an Online Business Strategy, 2000



Source: KPMG, 2000

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D. Purchasing Online

Of the two sides of e-commerce, it is the business-to-business buyers who have shown up first on the internet.

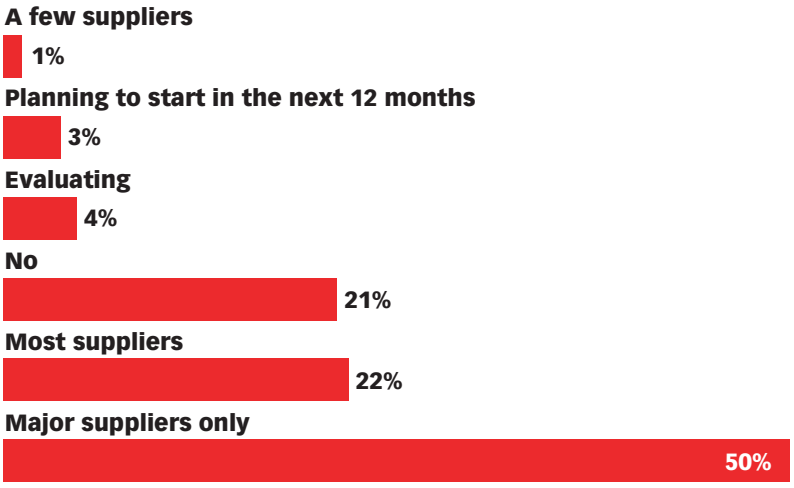
Due in part to the relative ease with which purchasing software can be developed and implemented, online procurement typically has been the first step toward e-commerce that most businesses have taken. Indirect procurement items –products that are not used as inputs in the production process, such as office equipment or maintenance, repair and operations (MRO) supplies– have most easily been bought or sold via the internet.

But direct procurement is moving online at a significant pace as well, as those products that are near commodities have begun to be traded via dynamic B2B exchanges, and as electronic data interchange (EDI) systems are being web-enabled.

Without question, the biggest electronic commerce platform is still EDI. The US Commerce Department estimates that EDI transaction revenues amounted to $3 trillion in electronic activity between 250,000 firms worldwide in 2000. The Yankee Group estimates that this currently accounts for 81% of total B2B electronic commerce.

In its November 2000 survey of CIOs, Morgan Stanley has found that more than 70% of large businesses have some kind of electronic connection to their suppliers, be it via the internet or legacy EDI systems.

Companies With Online Connections of Any Kind (EDI, Internet) to Suppliers for Procurement/Planning/ Fulfillment, November 2000



Source: Morgan Stanley Dean Witter Research, 2000

This and the following section look at the separate sides of the online trading equation, with the final section showing how they are coming together via B2B exchanges.

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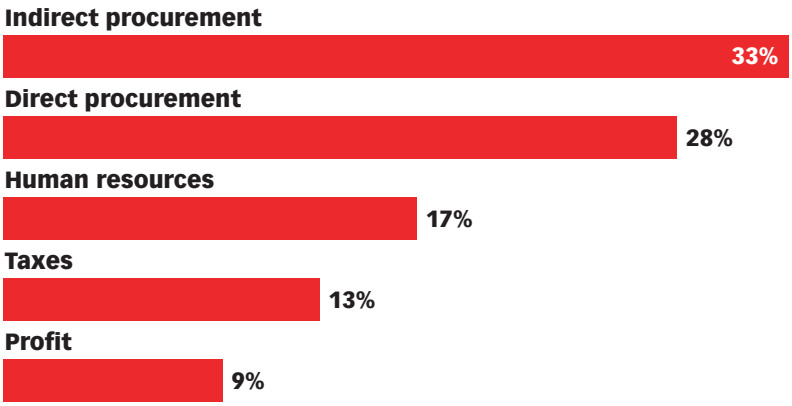
Making the Decision to Buy Online

Within some of the largest original equipment manufacturers (OEMs), A.T. Kearney estimates that there may be as many as 1,000 purchasing managers, buyers, and commodity managers. The buying process in these firms can be highly complex and paper-intensive.

From the control of rogue purchasing, to the ability to monitor how much an enterprise purchases from a particular supplier, e-procurement software helps provide companies with the ability to cut costs and generate internal efficiencies.

Quoting the business rule of thumb that 20% of a company's purchases constitute 80% of the value of its purchasing, the Butler Group provides a rough indication of the spending by a typical manufacturer. About one-third of spending is for direct procurement items, while nearly 30% of spending goes toward production inputs.

Corporate Spending for a Typical Manufacturer, 2000



Source: Butler Group, 2000

For companies that have adopted electronic procurement strategies, there are three primary alternatives that are available; electronic data interchange (EDI), bilateral exchange via a company's website, and/or access to a supplier's online catalog via e-procurement software. These electronic alternatives are part of the wider spectrum of purchasing channels, which include telephone, fax, as well as personal contact with suppliers' sales representatives.

Electronic Purchasing Channels, 2000

Electronic Data Interchange (EDI)
Suppliers' Web Sites
Procurement Software with access to electronic catalogs

Source: American Express, 2000

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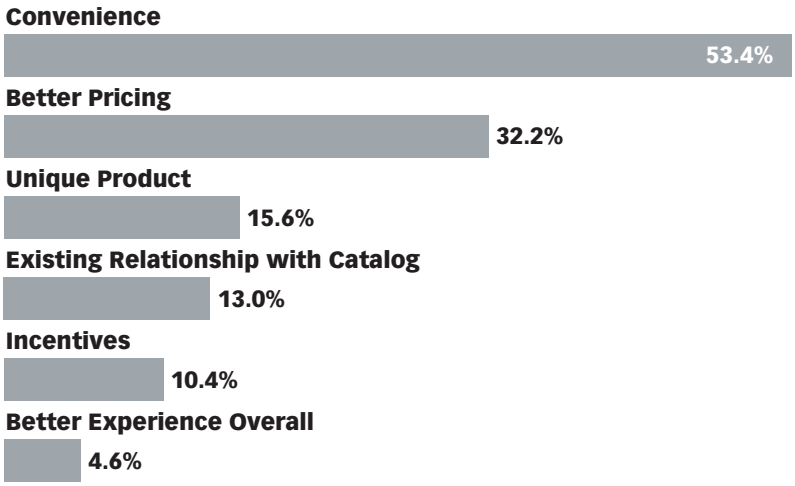
Among the reasons cited for their interest in online purchasing, respondents to *Catalog Age* magazine's survey of B2B purchasers said that convenience followed by pricing were the major factors in their decision to buy online.

Survey Response: Reasons for Buying From the Internet, 2000

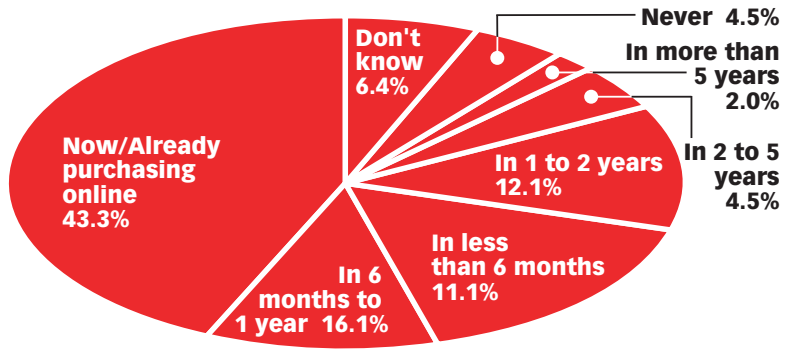


Source: Catalog Age, 2000

Measuring the degree to which firms are using the internet for procurement, ActivMedia found in a survey of business-to-business companies that 54% were buying online, with an average 21% of all company purchases being made via the internet.

By comparison, in Goldman Sachs' survey of 400 procurement professionals across 15 industries, the investment bank found that well over half of their respondents planned to be doing some kind of purchasing via the internet by early 2001, with 43.3% already purchasing online as of September 2000.

Planned Start of Online Purchasing by Procurement Professionals, 2000



Source: Goldman Sachs, 2000

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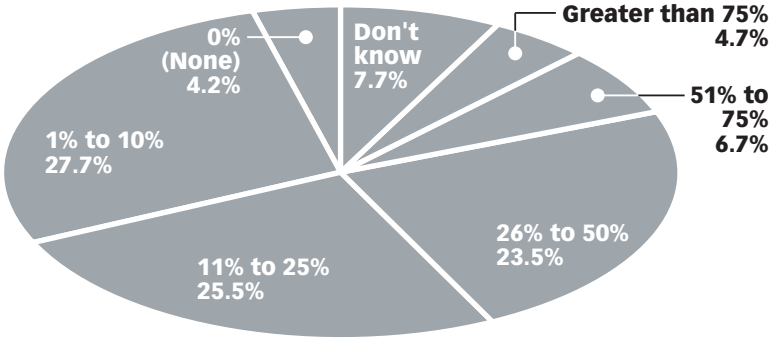
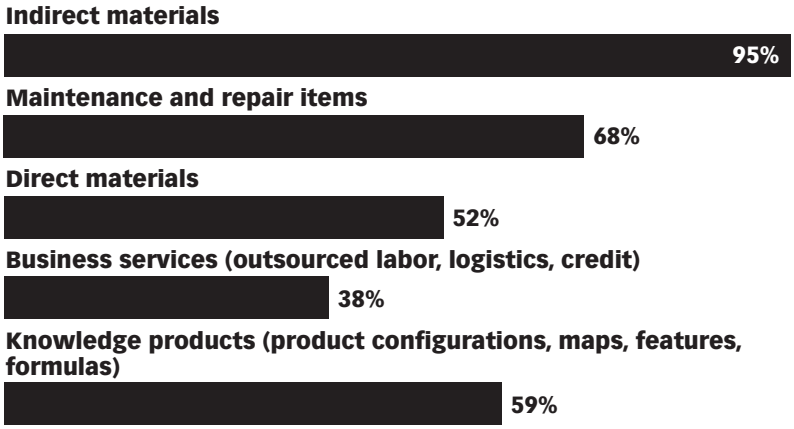
The majority of respondents to the Goldman Sachs survey expected to be doing less than 25% of their company's purchasing online. However, Goldman Sachs projects that as much as 80% of commercial activity will be conducted online within the next 20 years. This is in large part attributable to the investment banks' observation that many firms are already using the internet to obtain non-procurement items, such as business services and knowledge products.

Purchases Planned Executed Online by Procurement Professionals, 2000



Source: Goldman Sachs, 2000

Types Of Online Purchases by Procurement Professionals, 2000



Source: Goldman Sachs, 2000

In *Catalog Age* magazine's annual survey of business purchasing trends, 1,000 firms were surveyed about their online and offline buying activity. Among the surveyed firms, 57% did not purchase via the internet, and nearly 30% of companies did not even have internet access. The survey is somewhat biased toward small businesses, as only 320 of the respondents were companies employing over 200 people.

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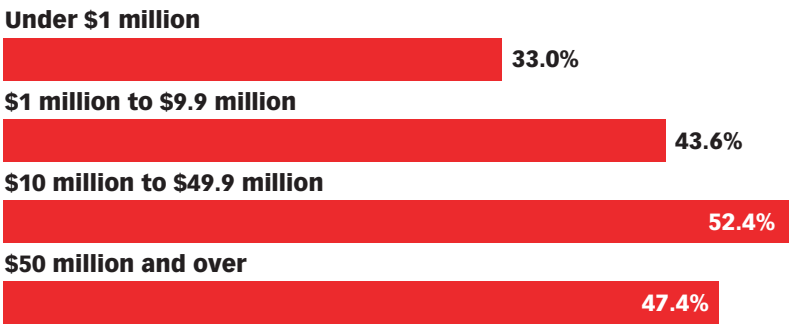
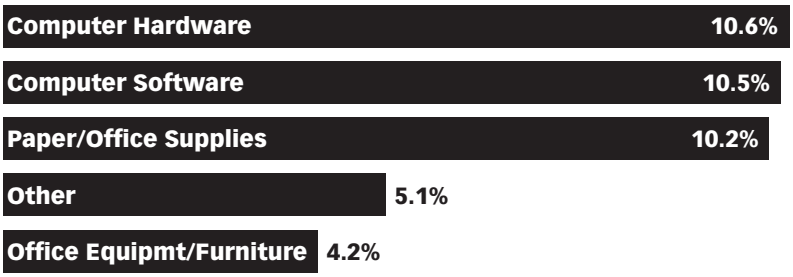
Firms That Have Purchased Online, by Annual Sales, 2000



Source: Catalog Age, 2000

A full 93% of survey respondents were regular buyers from business-to-business print catalogs, with 68% expecting to keep their offline catalog spending at the same level as the previous year.

Top Five Products Bought From the Internet, 2000



Source: Catalog Age, 2000

In its assessment of B2B purchasing intentions, Deloitte Consulting has found that indirect procurement items top the list of product categories targeted for online procurement. This is in part due to the fact that as a priority, companies want to obtain better control over indirect purchasing, as a means of lowering processing costs and reducing the amount of unapproved purchases.

Deloitte further points out that there is a close similarity between those items that are readily traded online for businesses, as for consumers. For vendors that began by selling their products to the consumer market over the internet, the transition to business-to-business sales has been a matter of making slight adjustments to their already-established sell-side technologies.

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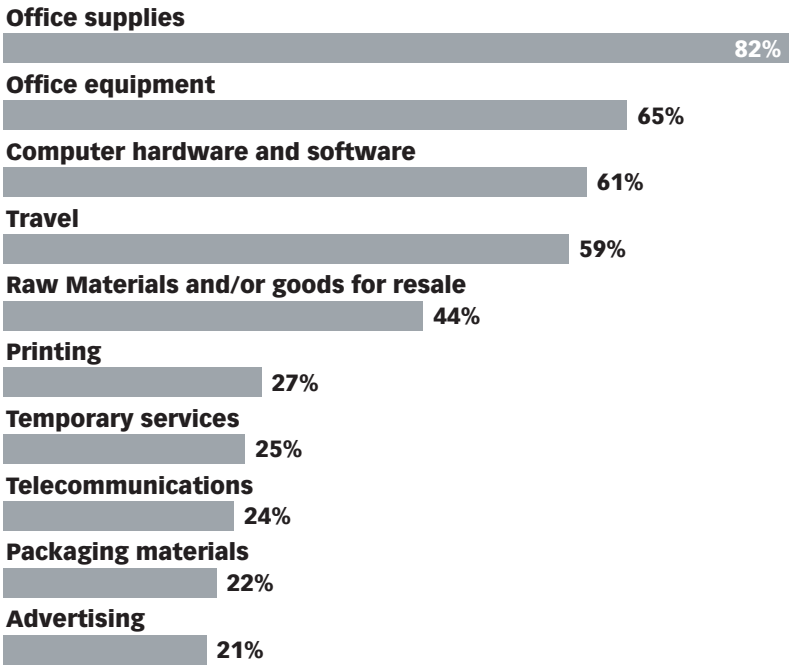
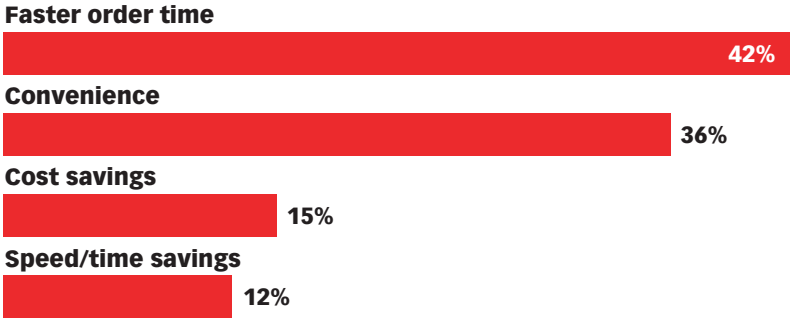
Top Ten Categories Targeted for Online Procurement, 1999



Source: Deloitte Consulting, 1999

Gauging the online purchasing activity of medium-sized businesses, American Express found that 40% of such firms in the United States were purchasing online. An additional 37% of survey respondents said that while they were using traditional purchasing methods in 2000, their intention was to go online in 2001. Once again, convenience was a leading factor driving businesses to buy online.

Top Benefits From Online Purchasing, 2000



Source: American Express, 2000

Among those firms purchasing via the internet, 14% of total purchasing activity was being conducted online, with most expecting to increase this share by 20 percentage points within the year. As a portion of online expenditures, stationery and office supplies accounted for 21% of total spending, followed closely by office equipment at 18%.

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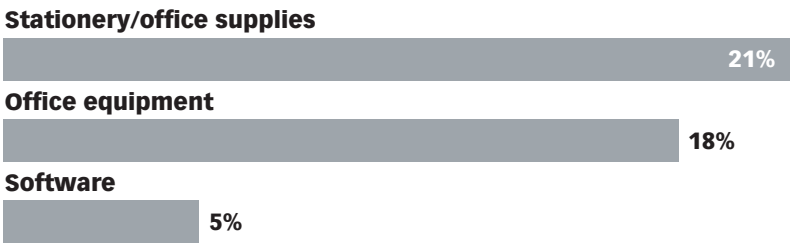
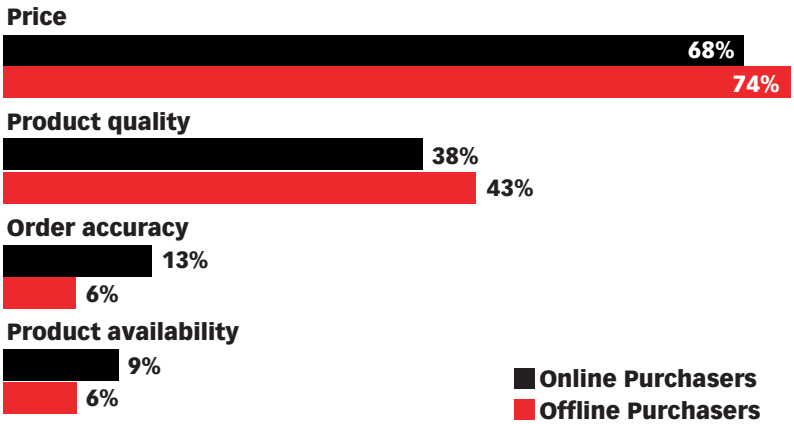
Leading Expenditure Categories Among Companies Using the Internet for Indirect Procurement, 2000



Source: American Express, 2000

When it comes to selecting an online vendor, there is a strong correlation with the selection criteria that companies use for an offline vendor. The only exception is order accuracy, which is a greater concern for companies when they are purchasing online.

Primary Factors for Selecting Vendors, 2000



Source: American Express, 2000

Compared with the implementation of more complex business technologies such as enterprise resource planning (ERP) systems or EDI, the Butler Group noted that return on investment for online procurement applications occurs at a much faster rate. Businesses have reported ROIs of between 200% and 400% for their procurement systems, with these benefits appearing within months rather than years.

An example of these savings occurs in the area of price discovery. The Aberdeen Group found that the average engineer spends as much as 30% of his or her time searching for parts and supplies, costing companies $20,000 per engineer, per year.

Zona Research estimates that offline searches may reach as high as $50 to $250 per item, compared to the use of online procurement channels, which cost between $5 and $20 per item.

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US Company Indirect Procurement Needs, 2000

Annual US Spending on Operating Resources	$250-$300 Billion
Amount of annual spending attributed to research for items	80%
Percent of firms requesting product-searching features in procurement solutions	60%
Percent of firms that buy travel products online	52%

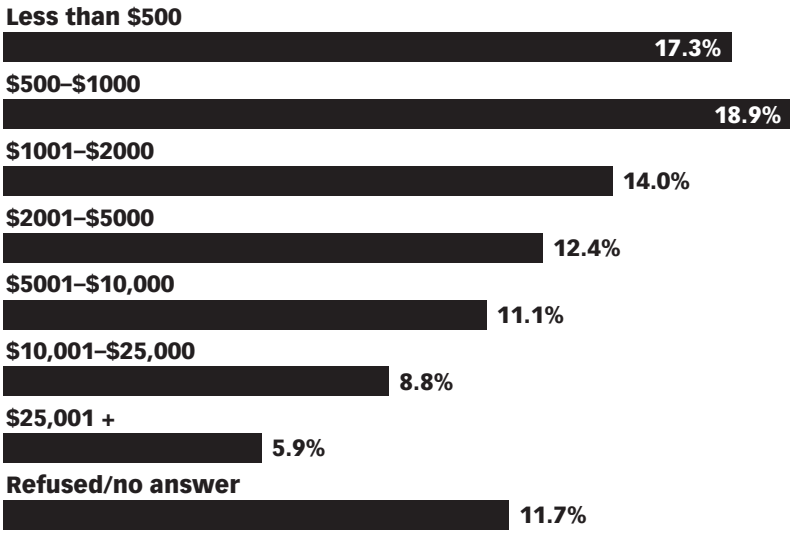
Source: Zona Research, 2000

In late 2000, the Hurwitz Group found that 66% of Fortune 500 companies were ordering less than half of their indirect procurement goods online. Most of the survey respondents complained that they could not maintain current price and cost information on the goods that they traded via the internet, while lack of supplier ability to sell online was a major hindrance for these online buyers as well.

Of those respondents that did buy online, 35% expected to spend more and 50% expected to spend about the same as they did in the past year.

The Catalog Age survey of small and medium-sized business buyers found that online purchasing grew significantly from 1999 to 2000. Business spending through online catalogs reached a mean of $8,700 per firm in 2000, compared to $5,758 for the year earlier.

Amount Spent Online Among Small And Medium Businesses, 1999



Source: Catalog Age, 2000

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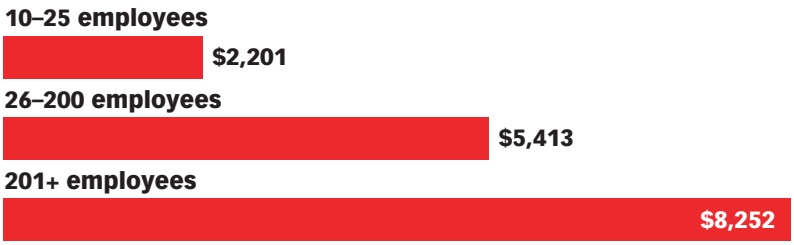
Average Business Internet Spending, 2000



Source: Catalog Age, 2000

But even among those firms that have taken a leadership position in technology adoption, in most cases less than 10% of purchasing was being done online throughout most of 2000.

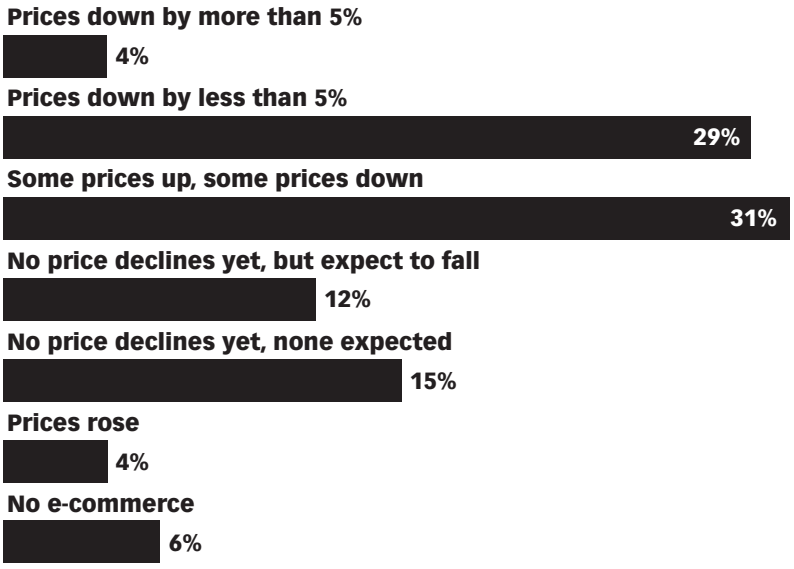
Online Spending by Brick and Mortars, 1999

		% of Purchasing
Owens Corning	$18.5 million	5%
United Technologies	$84 million	6%

Source: Business 2.0, 2000

The National Association of Business Economics' quarterly survey found that e-commerce had a slight impact on purchasing, with 29% of companies reporting that e-commerce helped reduce purchasing prices by as much as 5%. Productivity was greatly enhanced by e-commerce however, with almost 50% of survey respondents saying that reduced transaction costs were the number one gain from e-commerce.

The Effect of eCommerce on Prices, Q3 2000



Source: National Association of Business Economics, October 2000

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Breaking down the savings attributable to online purchasing, Credit Suisse First Boston has found that for both direct and indirect procurement items, companies will realize greater savings through the efficiencies gained in processing and control of their purchasing activity, as opposed to obtaining lower prices. Indirect procurement items offer the greatest opportunity for process savings, which may be reduced by as much as 50% according to CSFB.

Estimated Purchasing Savings via eCommerce for an Average Company, 2000

	% Savings	Operating Margin Improvement
Product Savings		
Direct Goods	6.5%	2.8%
MRO	30.0%	3.3%
Process Savings		
Direct Goods	25.0%	1.3%
MRO	50.0%	5.0%
Other SGA	10.0%	1.5%
Totals		**13.9%**

Source: Credit Suisse First Boston Technology Group, 2000

By comparison, A.T. Kearney estimates that electronic procurement can reduce overall operating costs by as much as 28%, rogue spending by 39%, and overall external spending by 7.5%.

Adding to the potential savings for online purchasers, the Butler Group has estimated that the cost of holding inventory can be as much as 40% of the value of that inventory. A.T. Kearney puts the total cost savings attributable to the use of an electronic procurement solution at 28%.

Reducing inventory levels through online supply chain coordination is a further benefit that online procurement can have on a company's bottom line. This is particularly relevant to retail companies, which by Roland Berger's assessment could benefit from faster order times and reduced inventory levels of as much as 10% to 15%.

However, as with most estimates that break down savings from electronic procurement, the greatest benefit of e-commerce is attributed to the streamlining of order processing and a reduction in the associated costs.

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Projected Benefits of Internet Procurement, 2000

Decrease Purchasing Time and Inventory	
Order process time	40-70%
Inventory levels	8-15%
Number of articles	10-15%
Reduce Purchasing Costs	
Cost of goods	3-10%
Processing costs	50-80%

Source: Roland Berger, 2000

Online purchasing remains as a small portion of total company purchasing, however, because many companies are still in the early-adoption phase of their e-commerce strategies. Most firms are taking a portfolio approach to implementing online procurement, in which their internet-based purchasing is one of several procurement channels upon which they rely. Over time, as internet procurement becomes more reliable and more widely integrated with company information systems, increased purchasing activity will be done online.

In an attempt to gain a sense of the current penetration rate of electronic procurement solutions, Arthur Andersen's survey of 105 large and medium-sized companies showed that almost two-thirds of respondents had not yet finalized their online procurement strategies. For many businesses, it has been important to take time to evaluate the technology offerings of the many e-procurement vendors.

Although not all of them are web enabled, IDC has counted as many as 50 different vendors of e-procurement software applications. Merrill Lynch estimates that at the end of 2000 only 8% to 10% of the world's largest 5,000 companies had set up procurement software. And Forrester Research estimates that only 4% of large companies were engaged in direct procurement online in 2000.

Large Companies Engaged in Online Direct Procurement, 2000 & 2002

Source: Forrester Research, 2000

Among those companies in Arthur Andersen's survey that had finalized their internet procurement strategies, the majority expected to spend less than $500,000 on an e-procurement system.

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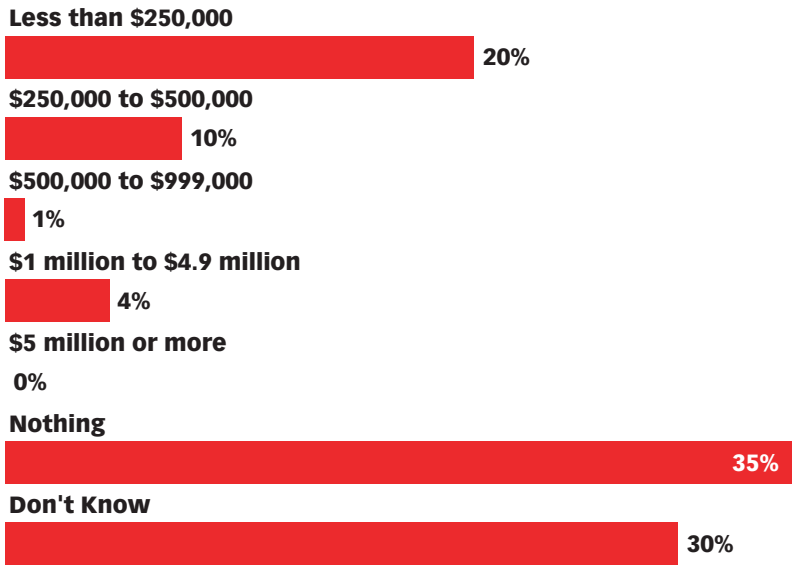
Online Procurement Systems Budgets, 2000



Source: Arthur Andersen, 2000

By this measure, the leading e-procurement applications may be priced out of the range of many medium-sized companies. Both Commerce One and Clarus sell their purchasing applications to users on a licensing basis, each at approximately $750,000, according to Bear Stearns.

Ariba's pricing model differs from that of other B2B procurement competitors, in that it charges a one-time licensing fee that is approximately 15% to 20% of the total cost of the application, plus an annual transaction capacity charge. By most accounts, the comparative pricing for Ariba's buy-side application is estimated to be slightly higher than its leading competitors.

Estimated Cost of Buy-Side Procurement Applications, 2000

Ariba	N/A
Commerce One	$750,000
Clarus	$750,000

Source: Bear Stearns, 2000

In its coverage of procurement software vendors, Bear Stearns found that Commerce One is leading the race for procurement providers internationally, with 50% of its revenues coming from outside the United States, compared to 15% to 20% of revenues for Ariba. However, in the closing months of the year 2000, Ariba was addressing this and becoming active in Latin America, Europe, and the Asia/Pacific Region.

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In total, Salomon Smith Barney projects the e-procurement software market will reach sales of $4.7 billion by 2004, compared to the market for B2B exchange platforms which is estimated to reach $2.8 billion in 2004. IDC's estimate for the worldwide procurement software market is $8.0 billion by 2004.

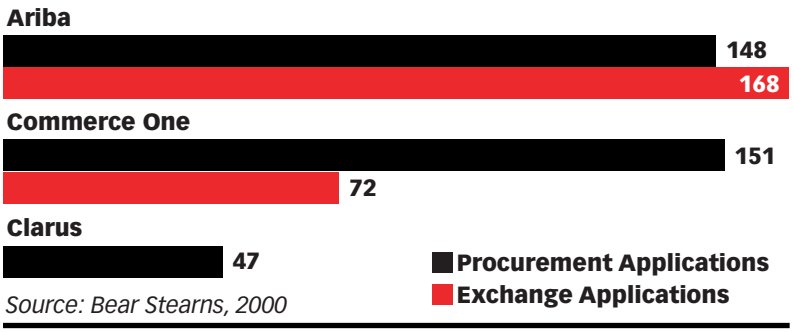
Estimated Worldwide Procurement Applications Revenues, 2000 & 2004 (in billions)

Source: International Data Corp., 2000

Because of the diverse purchasing needs within large companies, the Gartner Group has predicted that as many as 80% of Global 2000 firms will use two or more procurement applications to support their catalog commerce activities alone. By Gartner's description, these buy-side applications are actually closer to being systems, due to their complexity and need for substantial integration upon installation.

Comparing the relative success of the leading procurement and exchange software vendors, Ariba was serving as many as 40 of the Fortune 100 companies with its procurement applications by the end of the year 2000. Of its exchange applications customers, 16 of them were consortia-led exchanges. In the closing months of 2000, the Ariba, i2 Technologies, and IBM alliance claimed to be supporting more than 200 e-marketplaces worldwide.

B2B Applications Customers, by Vendor, Q2 2000



Source: Bear Stearns, 2000

By comparison, Oracle is said to have signed up 55 online exchange customers in late 2000. And at the end of the second quarter in 2000, Freemarkets had 64 customers using its auction services as buyers. Bear Stearns has estimated that Ariba will maintain its lead over rivals Commerce One and Clarus, by winning as many as 800 customers by the end of 2001.

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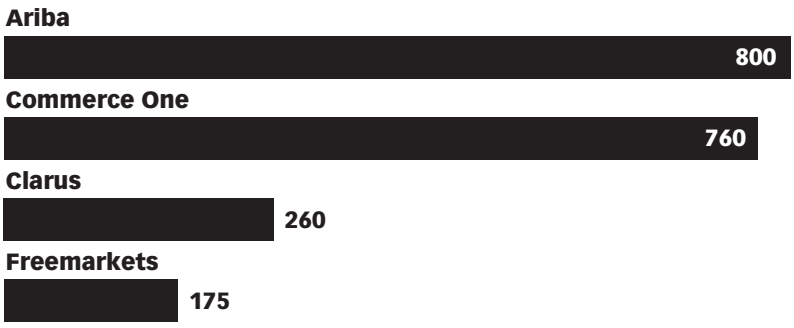
Estimated Number of Customers, by Year-End 2001



Source: Bear Stearns, 200

While the Boston Consulting Group believes that 40% of total B2B transactions will be conducted online by 2004, the research firm estimates that only 11% of purchases will be negotiated online. As a percentage of total online and offline purchases, online negotiation accounted for only 2% of B2B transactions in 2000.

The Boston Consulting Group has affirmed that much of online B2B will be composed of replenishment, rather than initiation of new transactions. This follows the pattern of EDI, which concentrates on document flows associated with recurring electronic purchases.

Purchases Negotiated Online as a Portion of Total Intercompany Gross Purchases, 2000 & 2004 (in billions)

	2000	2004
Purchases Online	$1,200	$4,800
Negotiated Online	$200	$1,300
Online Negotiation as a % of Online Purchases	16.7%	27.1%

Source: Boston Consulting Group, 2000

As it has been the case throughout the year 2000, one of the biggest obstacles most often cited by would-be online buyers is the lack of supplier capability to sell online. This is set to change, however, as the measure of business sell-side capabilities shows that several firms will be coming online in 2001.

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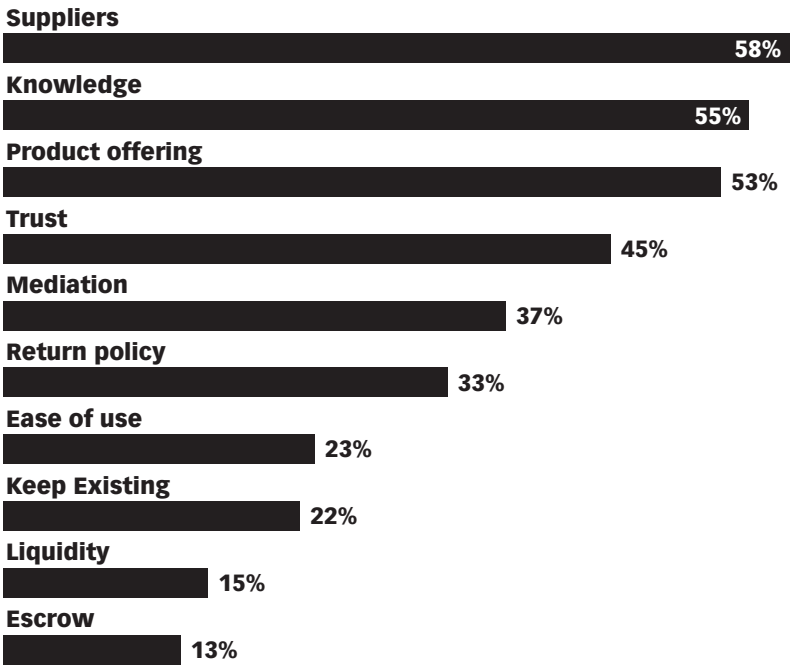
Reasons Why Buyers Say They Do Not Buy Online, 2000



Source: Jupiter Communications, 2000

E. Selling Online

Throughout the year 2000, the common complaint among companies that were implementing e-commerce strategies on the purchasing side was that there was little readiness on the part of their suppliers to sell to them.

However, preparing to sell to other businesses via the internet takes a much greater investment in time and technology than purchasing online. Sales-side software is more complicated to install and integrate with established legacy systems, and the complexities of business-to-business invoicing, payment, and delivery operations are much more difficult to accommodate than those of consumer e-commerce.

Data from ActivMedia confirms that few companies were indeed ready to sell online during most of last year, estimating that only 15% of websites that target other businesses were actually used to sell products via the internet. In most cases, businesses have set up their websites to provide basic company information.

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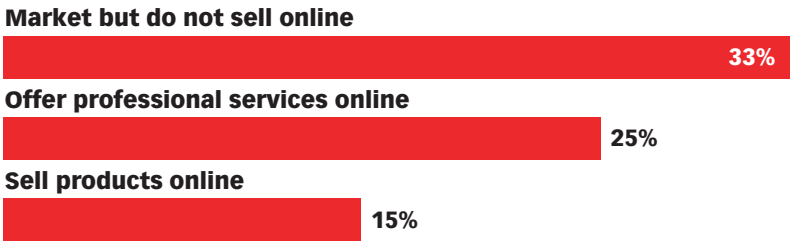
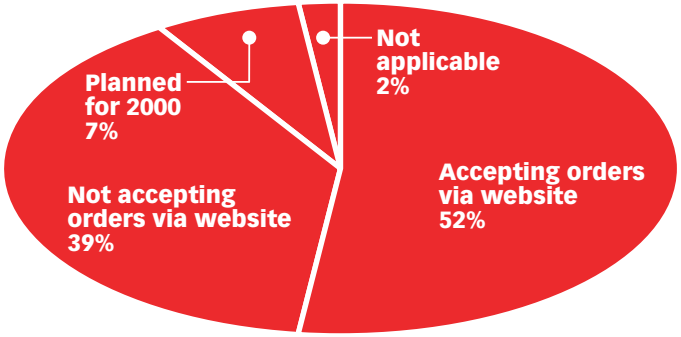
Focus of B2B Websites, 2000



Source: ActivMedia, 2000

But in a more recent survey, Morgan Stanley found that by November 2000 more than half of the companies it spoke with were able to accept orders via their own website. Almost 60% of respondents expected to be able to sell online by the end of 2000.

Companies Accepting Orders via Their Own Website, November 2000



Source: Morgan Stanley Dean Witter Research, 2000

Among those suppliers surveyed, there was strong demand for vendors to sell over the internet with almost 70% of companies being asked to sell online by at least a few of their customers.

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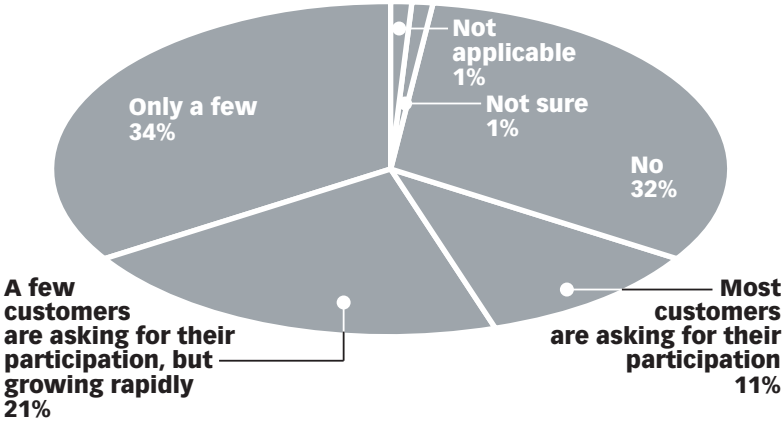
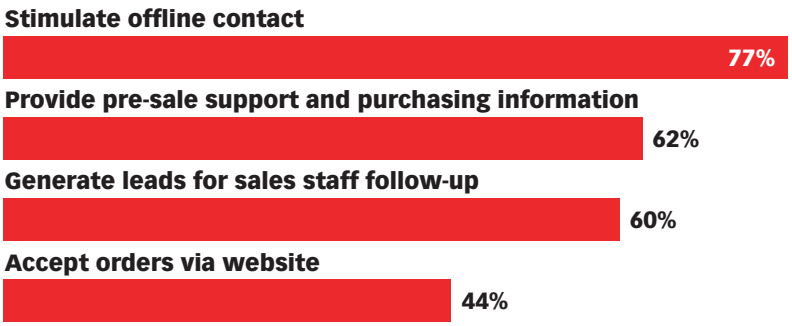
Companies With Customers Asking That They Participate in eCommerce Inititiatives as a Supplier, 2000



Source: Morgan Stanley Dean Witter Research, 2000

For the greater part of 2000, most business-to-business websites were primarily focused on generating offline sales leads by providing customers with pre-sales information or directing customers to offline sales channels. This reflects the ability of companies to take a pragmatic approach to their internet sales efforts, as they are gradually evolving their online presence from marketing to online customer service and sales.

eCommerce Capability of Proprietary B2B Websites, 2000



Source: ActivMedia, 2000

ActivMedia estimates that by 2002, the average sell-side B2B website will generate $2.3 million in revenues.

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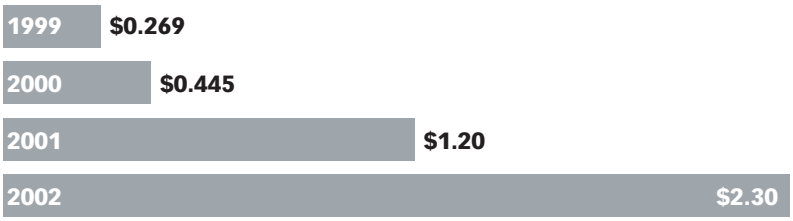
Average eCommerce Revenue Among B2B Websites, 1999-2002 (in millions)



Source: ActivMedia, 2000

As the body of e-commerce research shows, there are clear cost and operational benefits that buyers can expect to obtain through online procurement. This explains the relatively strong enthusiasm for internet commerce by those on the buy-side of the business-to-business equation.

By contrast, there has been perceived foot-dragging when it comes to e-commerce on the part of suppliers. For those companies that are being asked to sell online, there are concerns over the price transparency that the internet provides not only to their customers, but possibly to their competitors as well. Aggregated purchasing and negotiated volume discounts have also caused suppliers to see the internet as a technology tool that primarily benefits buyers at their expense.

But for those companies that do participate within a supply chain, there are some carrots that may prevent the buyers from having to take out their sticks to drive their suppliers online. Among the advantages often cited for moving a company's sales onto the internet, improved communication and process efficiencies are the most compelling. These bring convenience to a company's customers, but more importantly, they serve to reduce sales costs for the online suppliers.

Advantages to Enabling eCommerce Sales

Communication improves
The sales process becomes more efficient
Market reach increases
Customer service becomes more efficient
Collaboration with customers becomes easier
Inventory levels are able to more closely match demand

Source: eCommerce Business Research, 2000

Data from *Internet Week* shows that companies have seen a significant expansion in their customer base as a result of their internet capabilities. While the general average is at 8%, the high technology industry has seen its customer base increase by an average of 10%, thanks to the establishment of internet sales.

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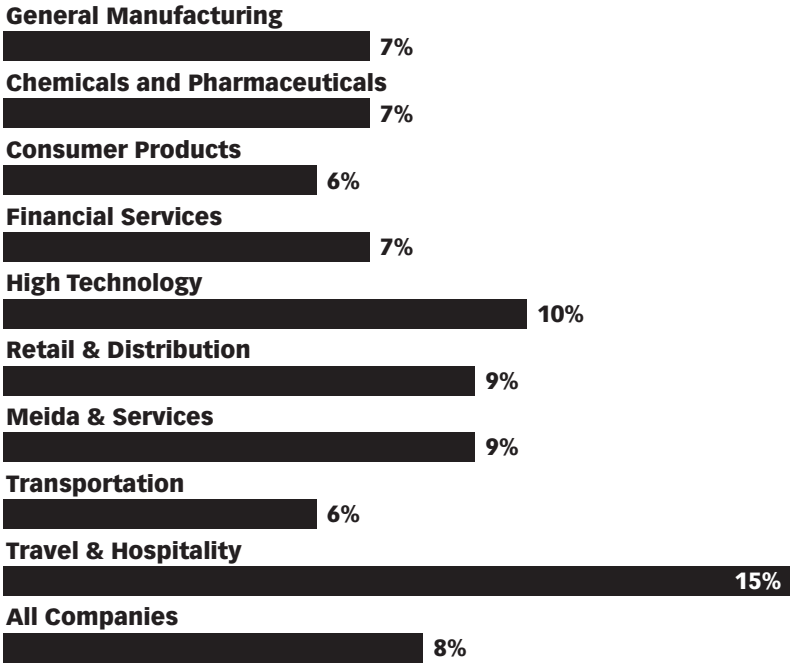
Degree to Which Companies Have Expanded Their Customer Base, as a Result of Internet Capabilities, by Industry, 2000



Source: Internet Week, 2000

For the consumer goods industry, businesses that sell to other businesses have found that their internet-based capabilities have helped to strengthen relationships with both customers and suppliers. Marketing and sales costs have been reduced through online sales capabilities as well. Of note is that 49.2% of consumer goods companies surveyed by Roland Berger had established websites for business-to-business support for their retailers.

Estimated Benefits of Internet Based Sales in the Consumer Goods Industry, 2000

Increase in top-line growth	
New customer growth	3-8%
Cross selling	5-15%
Retention rate	10-25%
Reduction in sales and marketing costs	
Marketing spending	10-15%
Sales costs	8-20%
Customer service costs	10-35%

Source: Roland Berger, 2000

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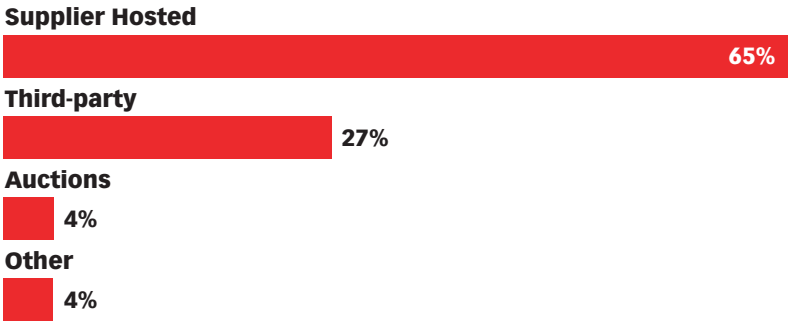
When it comes to taking the measure of bilateral e-commerce, Jupiter Communications estimates that 92% of B2B e-commerce transactions in 2000 took place in one-to-one relationships, often via website or extranet-based transactions between online buyers and sellers. This portion is expected to decrease to 65% of online B2B transactions by 2005.

Data from the Butler Group confirms this tendency for buyers to use supplier-hosted web solutions as a means of conducting online transactions.

Types of Websites That Buyers Use to Conduct Transactions, 2000



Source: Butler Group, 2000

And when it comes to using a supplier's website, most purchasing professionals prefer to have product information and sales contact details posted on the website. The capability to conclude an e-commerce transaction was low on the list during this late 1999 survey, as most purchasers preferred to be routed to an offline channel to close and confirm an online sale.

This may still be the case in the early part of 2001, due to the relatively high concern over order accuracy of online transactions. Until business buyers gain greater confidence in internet transactions, many will prefer to "talk around" an order with a live person, as a means of concluding a purchase and confirming details. To the extent that websites provide this complementary service, buyers will be more confident in their online purchases.

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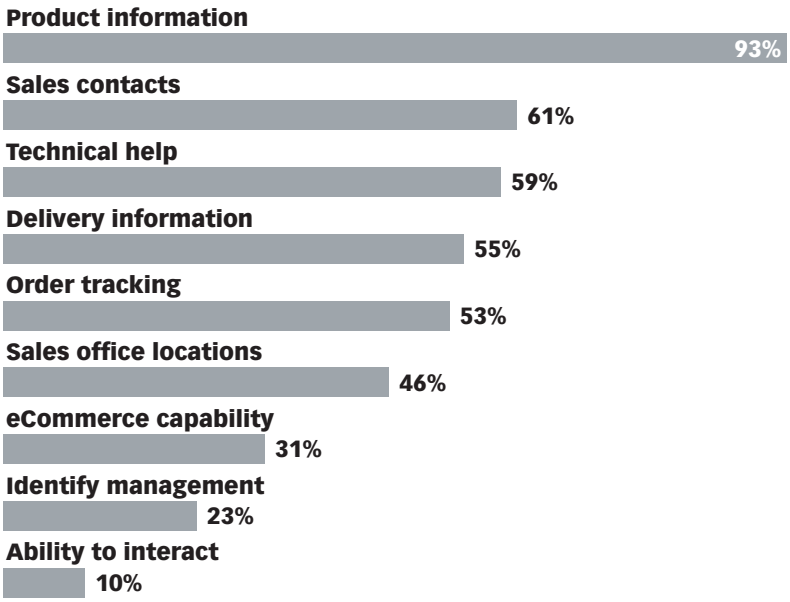
What Buyers Want to See on Suppliers' Websites, 1999



Source: Purchasing Magazine, 1999

In the last half of 2000, Andersen Consulting surveyed 320 commercial websites from companies in 15 US industries to examine the complexity of the web-based tools they were using to sell online. The highest number of sales mechanisms used on any site was seven by a firm in the financial services industry. The majority of companies used two or three different transaction mechanisms on their websites to sell via the internet.

Number of Exchange Mechanisms on Commercial Websites in the US, 2000

	Number of Websites	% of Respondents
More than one mechanism	212	66%
Three or more mechanisms	94	30%
Four or more mechanisms	31	9%

Note: Totals do not add to 100%
Source: Andersen Consulting, 2000

With as much as 40% of its revenues derived via internet sales in 1999, Dell Computer is considered to be one of the benchmark leaders in e-commerce. In conjunction with the University of Texas, Dell conducted a survey of US and European companies that were selling online.

Over 1,000 firms responded to the survey, with 45% of respondents being wholesalers, 35% manufacturers, 11% distributors, and 9% retailers. With a strong B2B component, the survey provides valuable insight into how businesses' e-commerce sales strategies are being implemented online.

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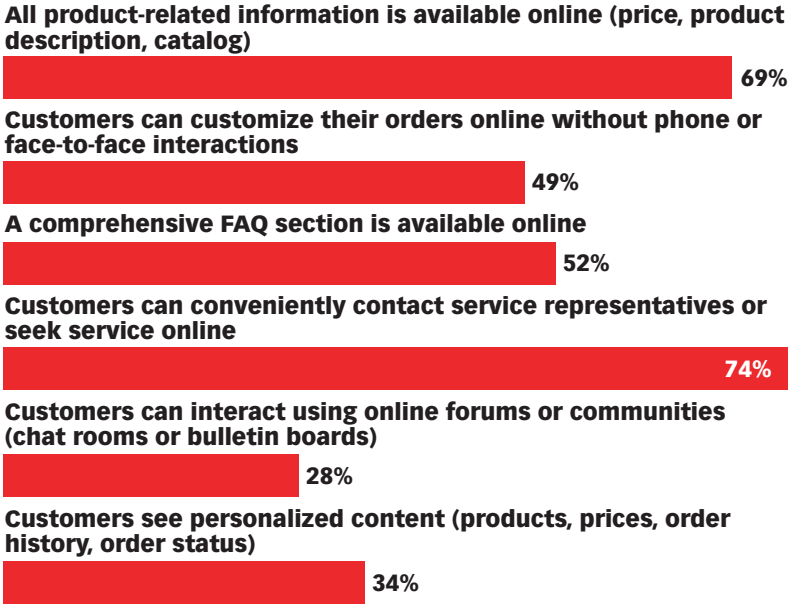
Almost 70% of respondents had full product information online, while 74% offered customer service via the internet in addition to offline channels.

Companies With Website Customer Service Features, 2000



Source: Dell Computer/University of Texas, 2000

With regards to additional transactional features, almost 70% of websites offered the ability to sell online and more than half permitted online payment, presumably through corporate credit or procurement cards.

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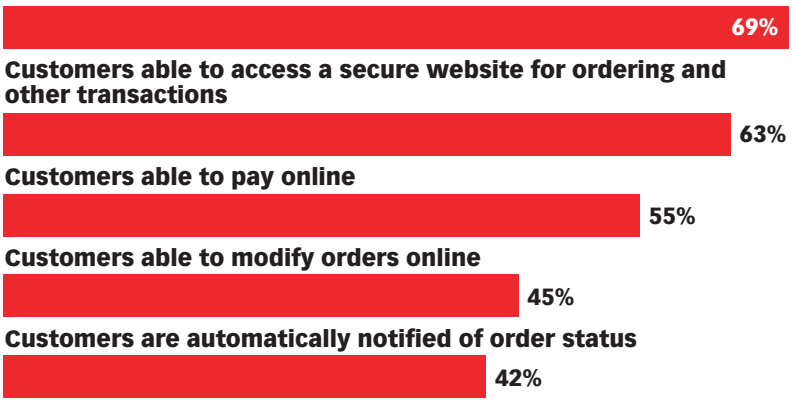
Companies Offering Transaction Capabilities Online, 2000



Source: Dell/University of Texas, 2000

Websites that offer online payment capabilities typically include such features as payment authorization, invoice generation and follow-up, as well as the ability to initiate and cancel payments.

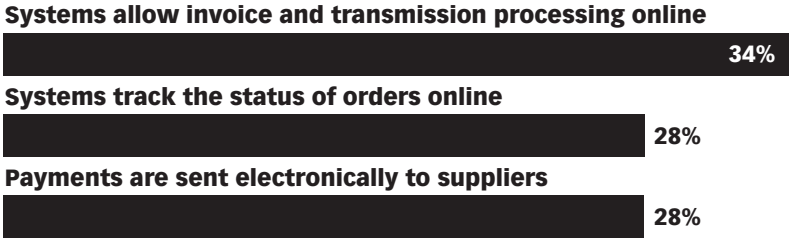
Example of Services Offered by a Full Online Payment Solution

Create and authorize payment orders
Buyer and supplier able to view unpaid invoices
View pending payments
Cancel payments
View invoice and payment order history

Source: eCommerce Business, 2000

Online payment and invoicing has great potential to open up cost savings for firms that are able to settle payments online. Already, almost one-third of companies are using the internet for invoicing and payment tracking according to the University of Texas study.

% of Companies Using the Internet for Invoicing and Tracking Orders With Supply Chain Partners, 2000



Source: Dell Computer/University of Texas, 2000

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However, in a survey of 100 Global 1000 companies, Shelley Taylor and Associates found that while 90% of these firms were selling to other businesses via their websites, only 9% of these websites provided new customers with the opportunity to initiate transactions online.

Some of the most active parties that are facilitating business-to-business electronic payments are, quite naturally, major banks and credit card companies. Although much of online B2B trade has been up to this point settled via credit or procurement cards, major software vendors are pairing up with commercial banks to offer internet-based credit and payment alternatives.

B2B Electronic Payments, 2000-2005 (in billions)

	2000	2003	2005
Internet	$90	$325	$880
EDI	$450	$550	$600
Proprietary Electronic Networks	$120	$110	$125

Source: Killen and Associates, 2000

For example, in the early efforts to expand upon credit-card based transactions, Oracle has paired with Citigroup for payment processing software, as well as GE Capital Commercial Services. Ariba has partnered with Bank of America and ABN Amro Bank for payment services, as well as American Express and VeriSign.

TradeCard is an online payment service that focuses on international payments, bypassing the traditional inter-bank transfer of funds. The cost of settling a transaction of up to $100,000 in funds is $150. At present, TradeCard is focusing on the Asian market.

Online Catalogs

Whether used as a customized buy-side catalog, or as a vendor's sales-side catalog, the assembly and maintenance of product data in a dynamic format is a complex and time-consuming process due to the literally hundreds of thousands of products that must be identified and frequently updated in an online catalog.

Despite many complaints that there are not enough suppliers selling online, suppliers are working fast to web-enable their catalogs. This is particularly the case for those companies that sell direct-procurement items. In many cases, these products have made a smooth transition from printed catalogs to digital catalogs.

Survey data from Andersen Consulting found that by late 2000, a catalog mechanism was available on as many as 61% of respondents' websites. By comparison, Morgan Stanley found that only 35% of the companies it surveyed had an online catalog, but an additional 14% of firms were in the process of converting their catalogs to an electronic format.

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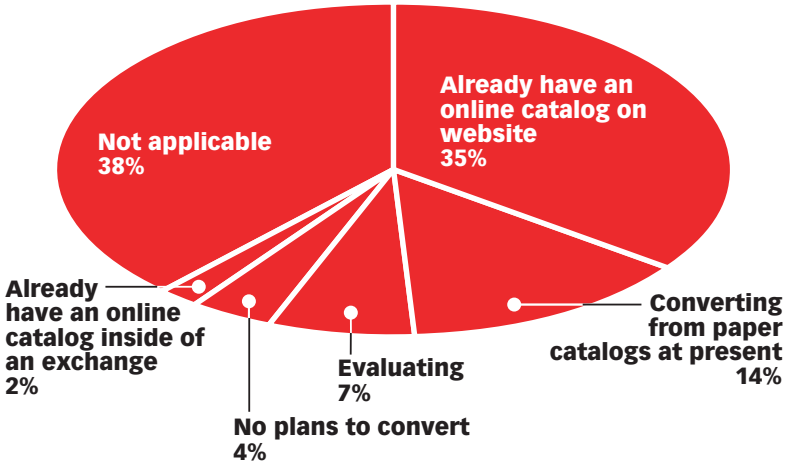
Company Readiness For Getting Content Online, June 2000



Source: Morgan Stanley Dean Witter Research, 2000

For those business-to-business vendors that do offer catalog features online, the Butler Group estimates that as much as 70% of online customer interaction occurs within the catalog area of their website.

When *Catalog Age* magazine surveyed regular business purchasers, it found that well over 90% of the small and medium-sized businesses it spoke with were using business catalogs of some kind.

Respondents That Shop by Catalog, By Company Size, 2000

Source: Catalog Age, 2000

The vast majority of catalog orders were placed by telephone, followed by fax and then mail. Among the small businesses that were buying via catalogs, only 10% were buying electronically.

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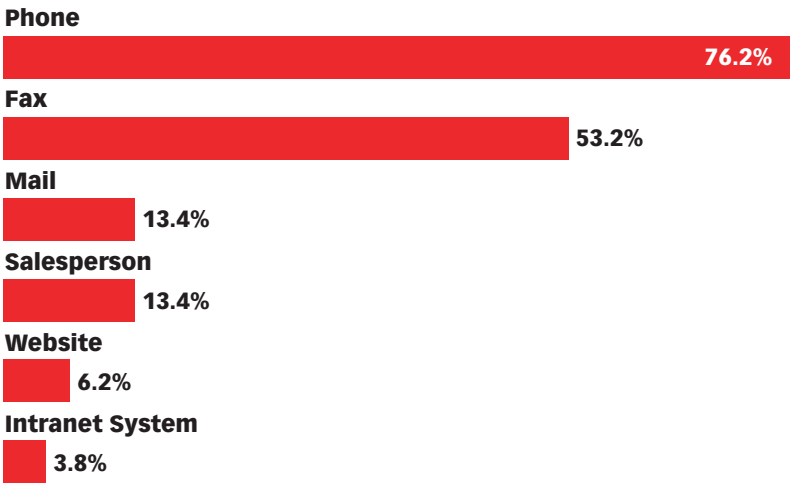
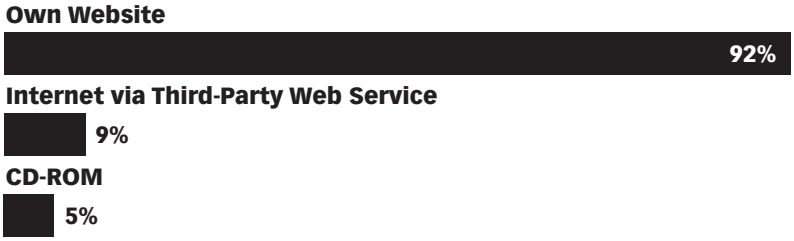
How Catalog Orders Are Placed, 2000



Source: Catalog Age, 2000

The primary format for distributing an electronic catalog is via the catalog company's own website, according to *Catalog Age*. Third-party websites accounted for less than 10% of online catalogs. However this number will likely see significant growth over time, especially as B2B exchanges continue to integrate catalog offerings.

Types of Electronic Catalogs Offered by Catalog Companies, 2000



Source: Catalog Age, 2000

And when it comes to converting offline catalogs into electronic format, the majority of catalog companies were using their own in-house staff to do the translation. Much of this has to do with the familiarity and control that catalog producers prefer to have over their product.

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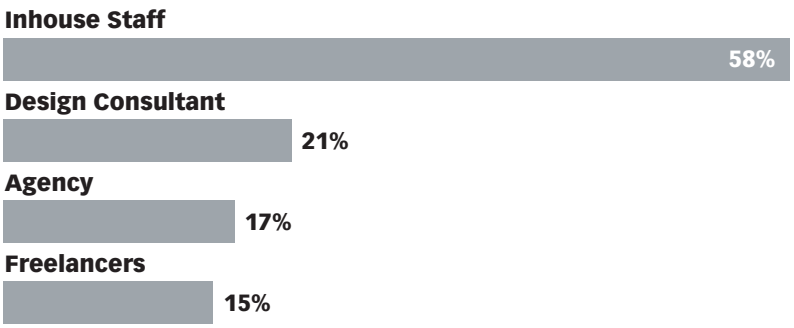
Who Designs Online Catalogs for Companies with Catalogs, 2000



Source: Catalog Age, 2000

For smaller companies that cannot afford to digitize their catalogs, some exchanges and catalog software companies offer to do it for them, in exchange for a commission on sales. These commissions can run as high as 5%.

Other digital catalogers charge suppliers a per-Stock Keeping Unit (SKU) fee for their services. With firms boasting as many as 500,000 digitized items, revenues can add up quickly for the catalog software companies.

One of the greatest challenges in content management, and in particular for the maintenance of catalogs, is the need for standardization. Product searches can be confusing if proper taxonomies are not developed, and potential sales can be lost through a descriptive disconnect between a buyer and seller.

To answer this need, there are several industry groups that are working together to standardize content. One example is RosettaNet for the electronics and IT industry. Consortia-led exchanges are also able to provide a central forum where standardization may occur.

However, there is a strong preference among many suppliers to maintain a significant degree of autonomy over their product catalog listings. Indeed, one of the major dilemmas for business catalog operators is that buyers want to see products that can be easily compared, by specification and price – in effect commoditizing manufactured products.

But vendors take an opposing perspective, with concern over commoditization leading sellers to go to great lengths to differentiate their brand and pricing.

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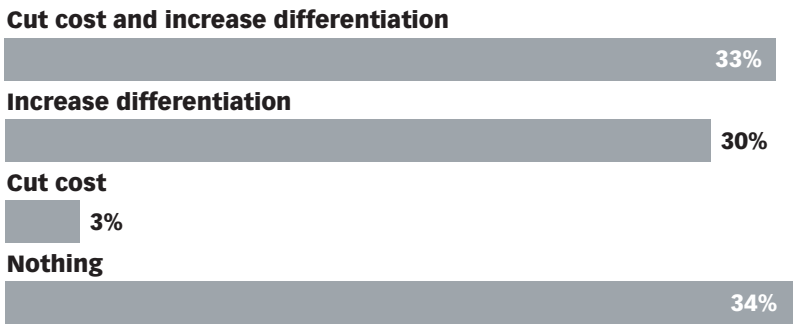
Actions That Companies Are Taking to Respond to Commoditization Threat, 2000



Source: Boston Consulting Group, 2000

Turning to buyer-directed catalogs, the AnswerThink Consulting group surveyed 10 Fortune 500 companies to determine the average cost for building and maintaining an in-house catalog for a two-year period. With the average catalog containing 129,200 individual items and a user base of 26,590 people, it was found that the cost to build and maintain each catalog averaged $29.31 per item.

Average Cost for Building and Maintaining Online Catalog Content, 2000

Number of line items	129,200
Number of users	26,590
IT Staff Headcount	5.4
Labor's % of Total Cost	45.70%
Hardware & Software Cost	$714,000
Total All Costs	$1,156,376
Average Cost per user	$1,503
Average Cost per item	$29.31

Source: AnswerThink Consulting, 2000

AnswerThink Consulting believes that companies can save as much as 75% of the cost of establishing an online catalog by turning to an outsourced catalog solution.

Average Two-Year Cost for Maintaining Catalog Data, 2000

In-house cost per part	$29.31
Third party cost per part	$7.75

Source: AnswerThink Consulting, 2000

It is important to note that this survey's methodology used only one firm per industry. Therefore, the results of AnswerThink's study may only serve as a rough benchmark for what firms may expect to pay for an in-house solution.

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Cost to Build and Maintain Online Catalog Content In-House, by Industry, 2000

	Number of line items	Number of users	IT staff cost	Hardware & software cost	Total costs	Average cost per item	Average cost per user
Telecommunications	200,000	150,000	$524,160	$2,000,000	$2,524,160	$12.62	$16.83
University	2,000	3,600	$70,000	$30,000	$100,000	$50.00	$27.78
Financial services	37,000	4,000	$499,200	$280,000	$779,200	$21.06	$194.80
Computer hardware	50,000	1,200	$455,000	$500,000	$955,000	$19.10	$795.83
Semiconductors	500,000	1,000	$166,400	$175,000	$341,400	$0.68	$341.40
Chemical	300,000	600	$249,600	$825,000	$1,074,600	$3.58	$1,791.00
Delivery service	100,000	23,000	$832,000	$1,500,000	$2,332,000	$23.32	$101.39
Health insurance	20,000	4,400	$832,000	$250,000	$1,082,000	$54.10	$245.91
Packaging manfucaturing	100,000	1,000	$291,200	$1,060,000	$1,351,200	$13.51	$1,351.20
Public utility	60,000	100	$499,200	$522,000	$1,021,200	$17.02	$10,212.00

Source: AnswerThink Consulting, 2000

Dell Computer uses Ariba's indirect procurement software to purchase from Office Depot's catalog, which contains over 150,000 products. Dell has selected a few hundred items for its approved-products list. When Dell went live with its procurement software in early 2000, it was using seven separate catalogs. It expects to use 30 different catalogs over time.

Source: eCommerce Business, October 9, 2000

As further examples of the expense and challenges of implementing an online catalog solution, IDC reported that Motorola at one point had hired 60 commodity managers just to convert and manage catalog updates from its suppliers, while TPN Register has said that one American technology company had spent $2.5 million in one year as part of its efforts to load catalog data from 40 of its suppliers.

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F. B2B Exchanges

As an element of e-business strategy, selecting an online B2B exchange has become a critical decision that several companies are facing. Businesses need to decide whether to go it alone, participate in a consortium-led exchange, or join a third-party exchange. Companies must also consider the number of exchanges that it will be necessary to connect with, as they will likely work with multiple marketplaces.

The cost to implement and integrate exchange applications will cause firms to be very selective about the prospects of survival that any public exchange they partner with will have.

The following chapter will help businesses gain a better sense of the current trends among B2B exchanges, so that they may make better partnering decisions for the long term.

Taking the Pulse: How Many Exchanges Are Out There?

As eMarketer identified in the July 2000 eCommerce B2B Report, there are three primary ownership models that have emerged among B2B exchanges.

The Three Primary Ownership Models for Online Exchanges

	Description	Example
1 Third-party Exchange	Exchange is owned and operated by a third party that is not considered to be a trading partner, often a B2B startup	Ventro (formerly Chemdex)
2 Consortia-led Exchange	Exchange ownership is shared between industry leaders and a technology partner	GM/Daimler-Chrysler/Ford exchange, Covisint
3 Private/Proprietary Exch.	Exchange is owned and operated by a single large firm	Wal-Mart's RetailLink

Source: eMarketer, 2000

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While startup dot-com exchanges and then the consortia-led exchanges received most of the initial press, by the end of 2000 private exchanges were finally getting their fair share of attention.

Deloitte Consulting has estimated that the number of B2B exchanges had peaked by the end of September 2000 at 1,500 globally, with 1,300 of those exchanges based in the United States. More than 1,000 exchanges are expected to fold, however, leaving between 70% and 80% of the remaining 400 to 500 exchanges evolving into niche players that provide specialized online services or technology.

By contrast, Keenan Vision weighs in with its prediction that 4,000 exchanges will exist in the United States by 2004, with a total of 8,000 exchanges worldwide. This assessment counts 230 distinct industries within the United States. Keenan Vision goes on to suggest that three tiers of exchanges will develop, serving trade flows that occur at global, regional/national, and local levels. Local exchanges are expected to connect to larger trading hubs, but carry the bulk of trade among business partners.

As of mid-December 2000, Sweden-based emarketservices has counted 751 horizontal and vertical B2B exchanges worldwide, by vertical industry and horizontal market.

Number of Horizontal and Vertical B2B Exchanges Worldwide, 2000

Vertical Exchanges			
Advertising and media	8	Healthcare	41
Agriculture	41	IT products and services	26
Automotive	20	Machinery and vehicles	19
Aviation	10	Marine	3
Chemicals and plastics	47	Metals	15
Construction	35	Packaging	6
Electronic and IT components	26	Printing	26
Energy	26	Pulp and paper	14
Environment	8	Telecom	31
Financial	32	Textiles	10
Food & beverage	51	Transport	48
Forestry and wood	11	Other	83
Horizontal Exchanges			
Hospitality	9		
MRO	24		
Office	7		
Services	20		
Other	54	Total	751

Source: emarketservices, 2000

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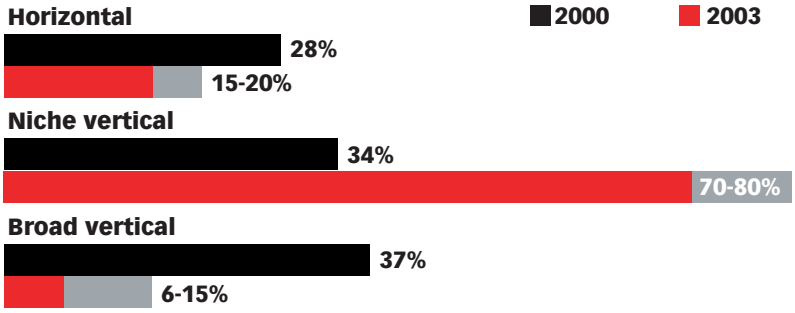
In its characterization of B2B marketplaces, Deloitte Consulting breaks down the various exchanges between three primary categories; horizontal, niche vertical, and broad vertical marketplaces. Although the three categories were equally prevalent in 2000, Deloitte sees the niche vertical exchanges becoming the predominant model by the year 2003.

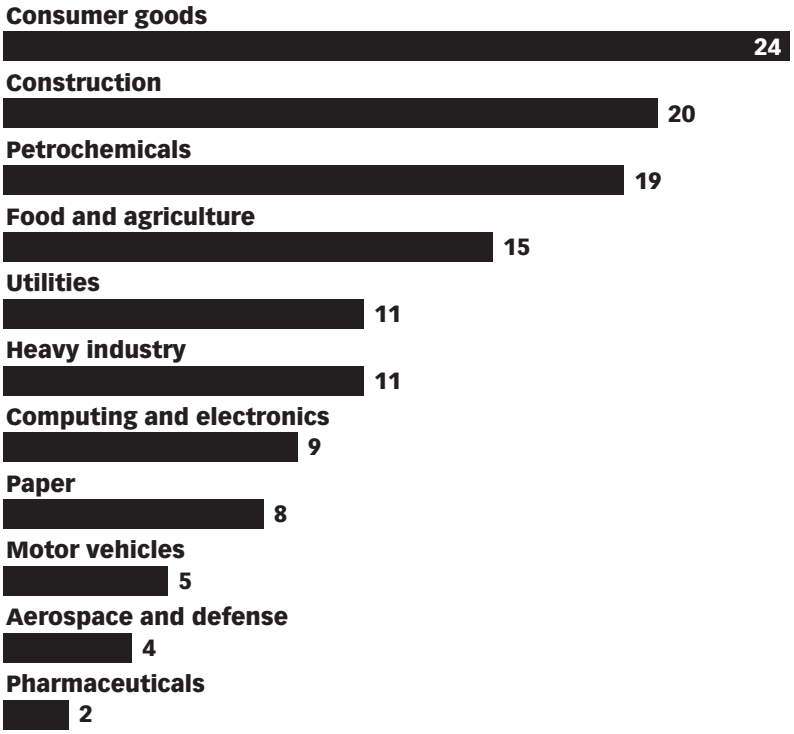
B2B Exchanges, by Category, 2000 & 2003



Source: Deloitte Consulting, 2000

With a similarly narrow forecast, Forrester Research believes that there will only be 181 marketplaces by 2003, with 128 vertical exchanges. The emerging consensus among leading research firms is that vertical industry marketplaces will become the most successful model for B2B exchanges.

Estimated Number of Surviving Vertical Exchanges, by Industry, 2003



Source: Forrester Research, 2000

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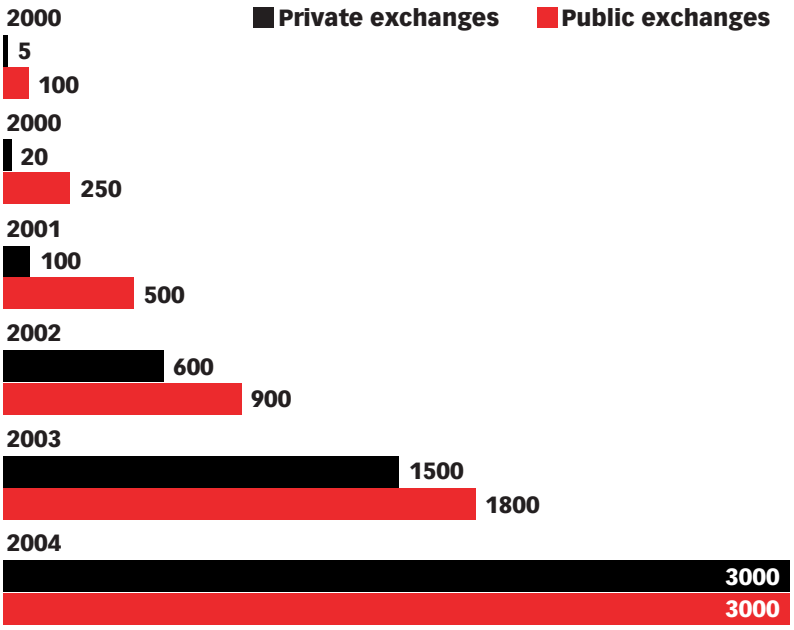
In addition to the vertical exchanges, Forrester predicts that there will just be four horizontal exchanges that sell indirect procurement items to businesses.

Credit Suisse First Boston offers a rough estimate of the number of private versus public exchanges that will be built.

Estimated Number of Private vs Public B2B Exchanges, 1999-2004



Source: Credit Suisse First Boston Technology Group, 2000

Making the Decision: Which Exchange Should a Company Join?

By the middle of the year 2000, many of the largest companies were considering whether they should build their own exchange, partner with industry competitors, or join an independent exchange. In an August survey, Forrester Research estimated that less than 25% of Fortune 1000 firms were participating in an online exchange, but that by 2002 70% of buyers and sellers would be participating in at least one so-called e-marketplace.

Internet Week found that the majority of large companies at that time were leaning toward participation in an industry consortium.

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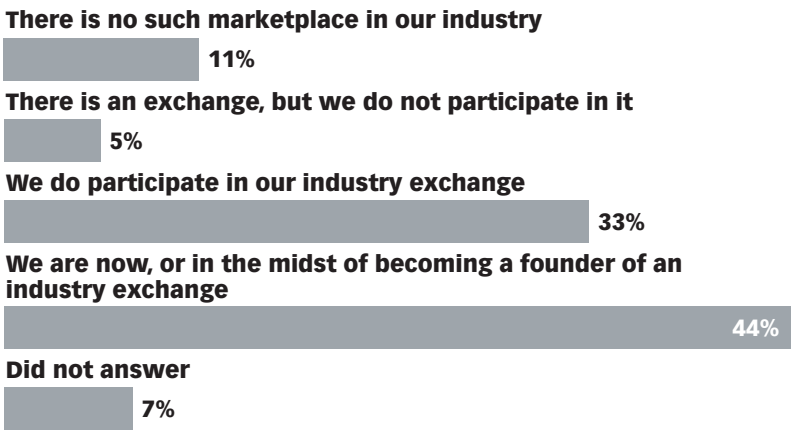
Degree to Which Companies are Involved with an Industry Marketplace, 2000



Source: Internet Week, 2000

However, later in the year *Infoworld's* November 2000 survey of e-business leaders found that a surprising 50% of these companies were not involved in an online exchange. Many companies had taken a step back from the rush to join exchanges with several firms deciding to take more time to evaluate their options.

Share of Companies Involved in an e-Marketplace, 2000

Source: Infoworld, 2000

More than one-third or 38% of companies surveyed by AMR Research said that they would wait at least one year before joining an online exchange, despite their interest in participating in one. Evidently the talk of a business-to-business exchange shakeout has stirred concern about committing to an online marketplace.

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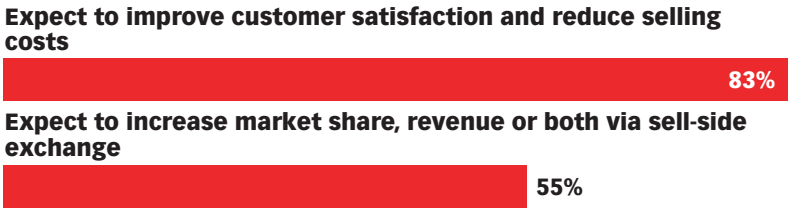
US Firms' Attitudes Toward Online Exchanges, 2000

Source: AMR Research, 2000

Among US firms surveyed by AMR Research that were expecting to participate in a B2B exchange from the sales side, the majority expected that improved customer service and reduced selling costs would be their primary benefits. Finding new business was a second priority, shared by a substantial 55% of respondents.

US Companies' Expectations for Online Sell-Side Exchanges, 2000



Source: AMR Research, 2000

Large companies are the early participants in B2B exchanges, according to AMR, with 40% of the enterprises it surveyed saying that they were participants. Small and medium-sized companies were eager to join exchanges, however, with 80% of interviewees saying that they planned to participate in the future.

In a survey of purchasing managers conducted in March of 2000, *Purchasing* magazine found that most professional buyers preferred to use their company extranets or private exchanges over any other means of online buying. While it is clear from the survey that there is a strong preference toward private buying channels, purchasing professionals also expect to use multiple internet-based means of buying online.

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Purchasing Manager Use of Business eCommerce Tools, March 2000

	Use Now	Will Use in Future	Total	Will Not Use
Extranets	13%	78%	91%	9%
Buy-side e-procurement systems (administered by buying organization)	17%	70%	87%	13%
Business to business sites that provide automated comparison shopping	0%	86%	86%	14%
Supplier administered sell-side e-procurement systems	30%	52%	82%	18%
Electronic marketplaces (aggregated supplier catalogs with single "front end")	8%	71%	79%	21%
Dot-com administered sell-side e-procurement systsems or online trading communities	13%	63%	76%	24%
Buying Clubs/Consortia	4%	57%	61%	39%

Source: Purchasing Magazine, 2000

It is important to note that this survey was conducted in March of 2000, before many companies had announced that they were forming consortia-led marketplaces.

Nonetheless, this trend from the *Purchasing* study was confirmed by Morgan Stanley's survey of information professionals in late 2000. It found that private exchanges were preferred by the majority of respondents as well. However, in this survey, there is also a clear interest to participate in both public and private exchanges.

Company Strategies for Participating in B2B Marketplaces, November 2000

Created an industry specific marketplace with major industry players	1%
Building a private marketplace but will let a public marketplace host it	1%
Don't know	7%
Marketplaces not relevant to industry/company	7%
No plans to participate in a marketplace at this time	8%
Plan to participate in a public marketplace when it's available	9%
Evaluating alternatives	12%
Building a private marketplace for suppliers to participate in	19%
Plan to participate in both public and private marketplaces	36%

Source: Morgan Stanley Dean Witter Research, 2000

Over time, as online e-commerce operations are streamlined, businesses will better be able to select preferred channels through which to conduct business. This migration will be gradual, as companies will initially hedge their bets through participation in multiple online sales or purchasing channels.

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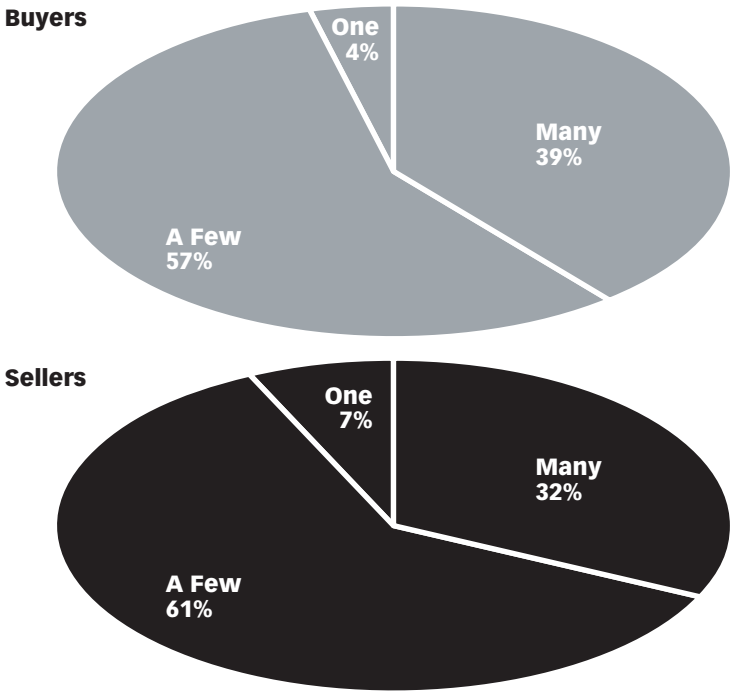
The Boston Consulting Group adds further confirmation to the expectation that businesses will be working with multiple exchanges, predicting that both buyers and sellers will work with a limited number of business-to-business marketplaces.

Business Expectation for Working with Multiple Exchanges, 2004



Source: Boston Consulting Group, 2000

Forrester Research surveyed 50 Global 2500 companies and found that 70% of respondents were planning to participate in more than one online exchange, with greater than half expecting to join between two and four exchanges.

In most cases, the internet itself will only serve as one of several channels through which customers will contact their business partners or conduct transactions. Traditional channels will not be displaced, certainly not in the near term. Instead, internet-based e-commerce will be offered as one alternative among several.

How Firms Will Use Their Multiple Exchange Alternatives, 2000

Third Party Exchange	Indirect procurement
Consortium Exchange	Content & Community, Spot Market Purchasing/Sales, Auction Services
Private Exchange	Direct procurement and/or Direct Sales and Supply Chain Management

Source: eMarketer, 2001

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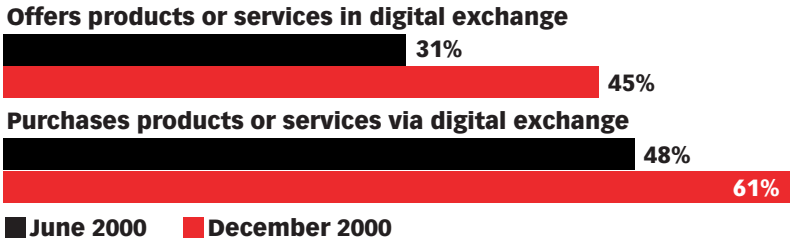
By the closing months of 2000, many of the largest companies had begun to participate on an experimental level with the leading B2B exchanges within their industries. In December Arthur Andersen published a survey of 105 medium- and large-sized companies, finding that almost half of these firms were selling products via online exchanges, while over 60% were doing some form of purchasing through a B2B exchange.

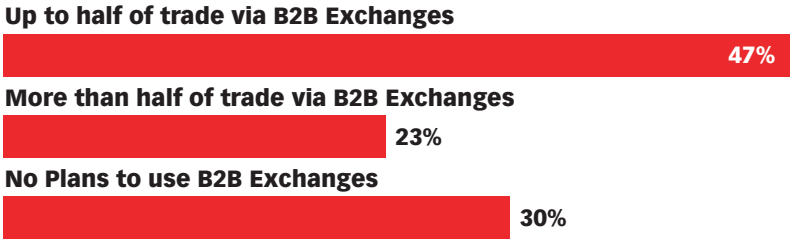
US Company Participation in Online Exchanges, June & December 2000



Source: Arthur Andersen, 2000

The Gartner Group estimates that by 2005, more than 500,000 companies will be participating in online marketplaces as either buyers or sellers. Of the 70% of large companies that Forrester Research predicts will be using a B2B exchange by 2002, most businesses believe that less than half of their trade will be conducted via these online marketplaces.

Projected Online B2B Exchange Use, 2002



Source: Forrester Research, 2000

The percentage of sellers going online is expected to be at about the same proportion as the number of buyers using B2B exchanges by 2002.

Sellers Using B2B Marketplaces, 2000 & 2002

Source: Forrester Research, 2000

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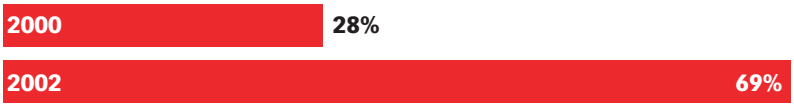
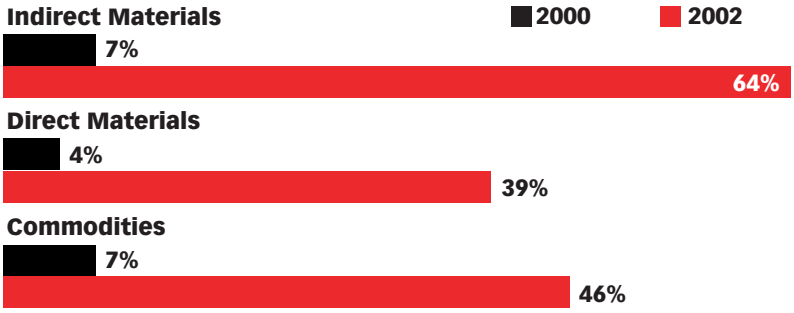
Buyers Using B2B Marketplaces, 2000 & 2002



Source: Forrester Research, 2000

And as with online procurement in general, in a survey of 50 purchasing executives from large enterprises, Forrester Research has found that indirect materials are the clear leader in terms of online transactions. Commodity-like goods are also expected to be easily bought and sold online by several companies, while direct materials remain the most difficult product to trade via the internet.

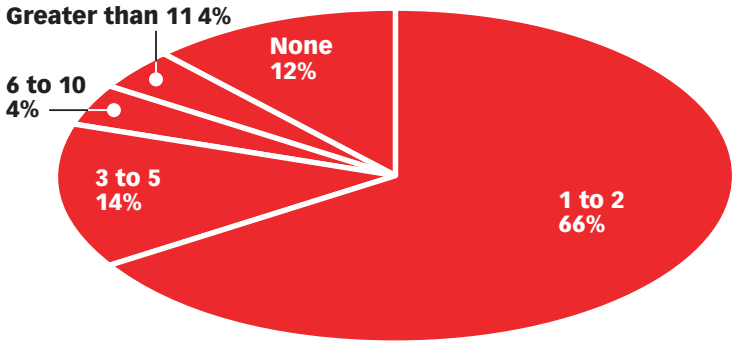
B2B Purchasing through Online Marketplaces, 2000 & 2002



Source: Forrester Research, 2000

It is clear that businesses expect to use more than one online exchange to conduct their indirect procurement. Should companies add a direct procurement channel, be it through their own private exchange or via a third party, large companies can expect to be joining between three to five B2B exchanges.

Online Marketplaces that Businesses Expect to Use for Indirect Procurement, 2000



Source: Forrester Research, 2000

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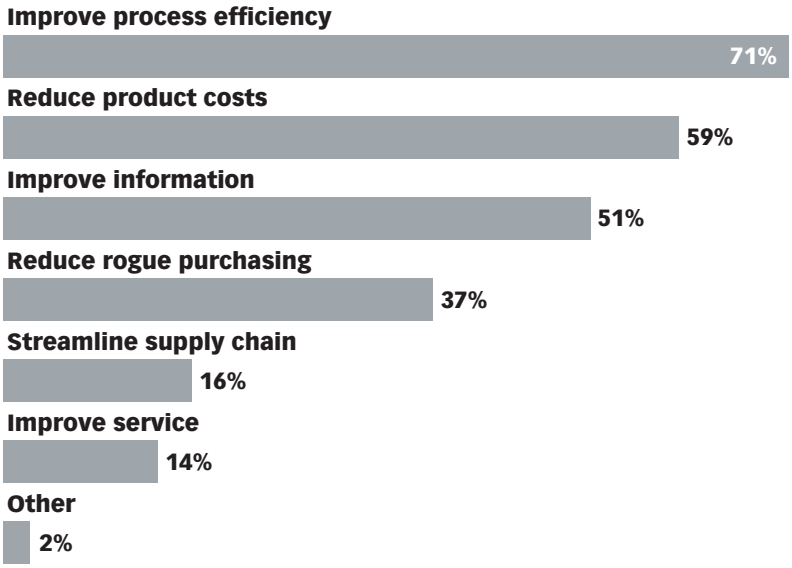
Forrester surveyed 50 purchasing executives at companies that traded more than $1 billion annually, finding that cost reduction and improvements in process efficiency were the primary reasons for why they chose to buy indirect materials via online marketplaces.

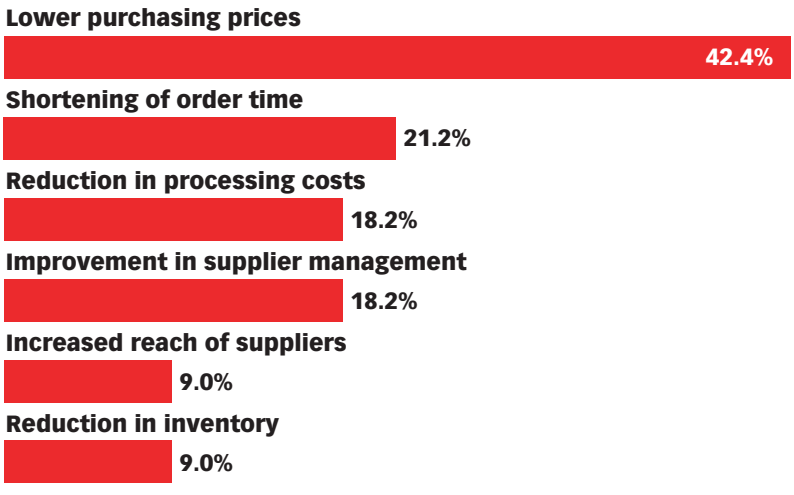
Why Firms Use Online B2B Markets to Buy Indirect Materials, 2000



Source: Forrester Research, 2000

By comparison, Roland Berger's examination of the retail industry shows that businesses are expecting to obtain lower purchasing prices via B2B marketplaces. Efficiencies gained through a shortened order time and improved purchase processing were also among the leading reasons for joining an online exchange, however.

Top Reasons Firms Cite for Joining a B2B Marketplace, 2000



Source: Roland Berger, 2000

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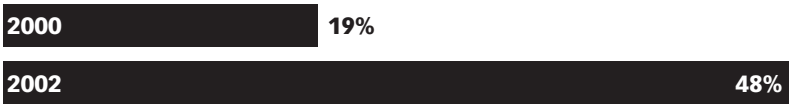
While only 19% of executives believed that vertical B2B exchanges were important for their supply chain management in 2000, almost half of survey respondents believed that by the beginning of 2002 vertical exchanges would be playing a significant role. Therefore, customization of exchange-based products and services was crucial to 55% of survey respondents.

Survey Respondents Who Agree Vertical Exchanges are Important for Supply Chain Management, 2000 & 2002



Source: KPMG, 2000

A survey conducted by AMR Research found that supply chain management professionals were primarily interested in using online exchanges as pertains to supplier-facing activities, such as product cataloging and order status tracking. While 31% of respondents said that their interest in an exchange was tied to customer-facing operations, 43% said that improving both customer and supplier facing operations was part of their joining an online exchange.

Participant Interest in Online Exchange Capabilities, 2000

Most Desired Functions (most desirable first)
Product search capability
Order status and tracking
Product catalog
Vendor search capability
Supplier-Buyer integration
Least Desired Functions (least desirable first)
Auction
Collaborative product and design
Job and industry specific news
General news service
Negotiation (not including RFP, RFQ)

Source: AMR Research, 2000

Dynamic pricing, or the ability to negotiate prices online, is expected by IDC to rise from 5% in 2000 to 13% of worldwide B2B trade by 2004. The United States is expected to lead countries in the use of dynamic pricing as a part of online business relationships between trading partners, at 20% of B2B trade.

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Worldwide B2B eCommerce Attributable to Dynamic Pricing, 2000 & 2004

Source: International Data Corp., 2000

The Current State of Active Exchanges

Of the estimated 1,000 B2B exchanges that A.T. Kearney has counted in 2000, only 15%, or roughly 150, have begun to deliver services or generate transactions.

Present capabilities of most business-to-business exchanges include spot purchasing, surplus auctions and indirect procurement. Aggregated catalog sales and information/news are also available. A September survey conducted by A.T. Kearney of high-technology industry exchanges revealed that most exchanges were only able to conduct the most basic commercial and content services.

Content and Commercial Capabilities among High Tech Industry Online Exchanges, September 2000

Total Number of Exchanges: 18 (2 Consortia, 16 Third Party Exchanges)

	Number of Exchanges With Capability	% of Exchanges
Commercial Services		
Product Search	18	100%
RFP/RFQ	13	72%
Catalog	11	61%
Auction	6	33%
Exchange	3	17%
Financing	4	22%
Logistics	7	39%
Outsourcing	7	39%
Content Services		
Industry News	12	67%
Product Information	9	50%
Q&A	5	28%
Advertising	2	11%
Interactive Media	7	39%
Collaboration Services		
Design	6	33%
Forecasting	3	17%
Bill of Materials	5	28%

Note: Outsourcing includes third party consulting services, shipping. Interactive media includes message boards, chat.
Source: AT Kearney, 2000

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It should be noted that neither of the two consortia exchanges in this survey had exchange capabilities as of September, while they both did offer auction services.

Gartner Group defines a market maker as an enterprise that brings together buyers and sellers to form an online commercial group. By Gartner's definition, however, transaction capabilities may be only one part of a market maker's total online revenues.

Content and value-added services are often part of these market makers' income, so the revenues cited below do not show the value of online transactions alone.

Leading Online B2B Marketplaces by Revenues and Market Share, 1998 & 1999 (in millions)

	'99 Revenue	'99 Market Share	'98 Revenue	'98 Market Share	Growth '98-99
Ingram Micro	$131.2	26.4%	$53.5	29.2%	145.2%
Tech Data	$60.6	12.2%	$18.0	9.8%	236.0%
Arrow Electronics	$59.1	11.9%	$25.7	14.0%	130.0%
Avnet	$37.7	7.6%	$17.3	9.4%	117.9%
Grainger	$37.4	7.6%	$4.9	2.6%	633.0%
VerticalNet	$19.7	4.0%	$3.0	1.6%	556.7%
FreeMarkets	$15.7	3.2%	$5.9	3.2%	166.1%
Altra Energy	$15.0	3.0%	$9.0	4.9%	66.7%
Others	$121.2	24.1%	$45.9	25.1%	164.0%
Total	**$497.6**	**100.0%**	**$183.2**	**99.8%**	**171.0%**

Source: Gartner Group, 2000

Interactive Week's annual survey of top B2B websites measures B2B e-commerce activity for the prior four quarters ending June 30, 2000. The top 25 B2B websites accounted for almost $127 billion in revenues during this period, while the top 50 B2B websites brought in a total of almost $132 billion in online revenues. As a share of the total online revenues among the top 50, the top ten firms accounted for 78.5%.

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Top 25 Business to Business Websites by Online Revenues, 2000 (in billions)

Intel	$23.8
IBM	$17.0
Cisco Systems *	$15.0
Dell Computer *	$13.5
General Electric *	$7.50
Ingram Micro	$6.00
Worldcom	$6.00
United Parcel Service	$5.35
Lucent Technologies	$5.00
Federal Express *	$4.50
Tech Data	$4.20
Bellsouth	$3.14
3COM	$2.64
Gateway	$2.20
Compaq Computer *	$1.97
Hewlett-Packard *	$1.96
Arrow Electronics	$1.83
National Semiconductor	$1.30
CMGI	$0.90
Microage *	$0.74
Micron Electronics *	$0.72
Office Depot	$0.58
Oracle	$0.50
Rowecom	$0.39
Total	**$126.72**

** Interactive Week estimate. Financial figures are for the four fiscal quarters ended on or close to June 30, 2000*
Source: Interactive Week, 2000

Other top 50 mentions that are worthy of note include Verticalnet, with online revenues of $319 million, Staples with $238 million, MRO website WW Grainger at $155 million, and Ventro rounding out the top 50 with $76 million in internet-based income.

One of the key factors that each of *Interactive Week's* e-commerce leaders have in common is the evolution of their internet-based systems out of the need for improved customer service. Intel began its online operations in July of 1998, while Cisco's internet service began with customer bulletin boards in 1992. Both Intel's and Cisco's systems went global right near their beginnings, with Intel initially offering service in ten countries, and Cisco operating its service in 14 languages.

Toward the end of the year 2000, Dell Computer was claiming to bring in 50% of its revenues online, with $50 million per day in internet sales.

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In Jupiter's estimates of the leading B2B exchanges, the research firm sent out over 1,000 surveys to online exchanges that it has been tracking. The revenues listed for the third quarter of 2000 are gross revenues from all online operations.

Leading 25 Exchanges, by Revenues, Q3 2000

	Industry	Q3 2000 Revenues
Onvia	MRO	$45,300,000
VerticalNet (1)	Multi-industry	$36,800,000
Virtual Chip Exchange	Electronics	$32,200,000
Ventro (Chemdex)	Life Sciences	$28,712,000
FreeMarkets	Industrial Supplies	$26,600,000
eSpeed (1)	Electronics	$20,000,000
SciQuest	Scientific Equipment (Life Sciences)	$19,700,000
Global Sources	Retail	$15,200,000
TestMart	Scientific Equipment	$3,800,000
Neoforma.com, Inc.	Healthcare	$2,300,000
PartsBase	Aerospace	$1,660,000
Datastream Systems (iProcure)	MRO	$1,000,000
Mercateo.com	Professional Services	$1,000,000
BulkDrugs.com (2)	Pharmaceuticals	$1,000,000
Powersource Online	Electronics (Computers)	$808,000
NVST.com, Inc.	Financial Services	$665,172
Global Food Exchange	Food & Beverage	$510,357
Verida internet (Agriplace)	Agriculture	$254,717
vertacross	Industrial Equipment	$200,000
IMX Exchange	Financial Services	N/A
LiveListings	Automotive/Parts	$114,000
Greentrac.com	Lawn Turf Services	$97,000
econia.com	Goods and Services	$90,000
AgEx.com	Agriculture	$75,026
20TONS.com	Plastics	$50,000

(1) Adjustment for online revenues. (2) Jupiter estimate. N/A Revenue withheld by request
Source: Jupiter Communications, 2000

As with the Gartner Group's estimates for online revenues, Jupiter Communications has not separated out transaction revenues from the gross revenue figures for all online services.

In its survey of 100 internet marketplace executives, Jupiter found that there was a considerable difference in estimates for the cost of building an internet marketplace. Much of these discrepancies can be accounted for by the variance in technologies, products, and services covered by individual exchanges. More than half of the marketplaces cost more than $5 million to build.

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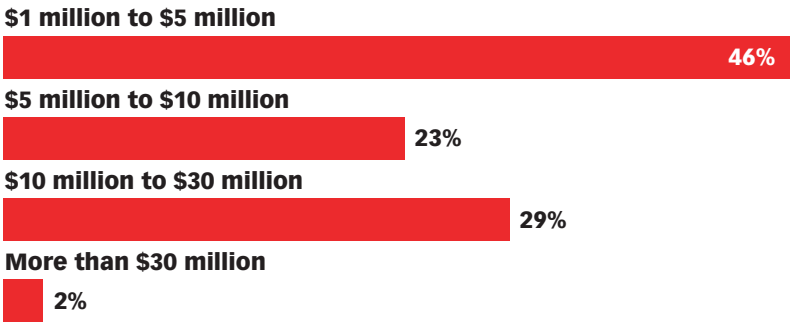
Cost to Create a Net Marketplace, 2000



Source: Jupiter Communications, 2000

By comparison, AMR Research projects the total cost of developing a consortium-led exchange is between $250 million and $500 million, while private exchanges can require an investment of more than $100 million.

The expensive cost of establishing an internet exchange with true, dynamic trading features is substantial. This is one of the principal reasons cited by third-party exchange Ventro when it closed down its Chemdex and Promedix exchanges. The cost of building and running them was too high.

And this is also part of the reason why several leading consortia exchanges have been formed. Indeed, 42% of executives surveyed by Arthur Andersen in late 2000 agreed that upfront costs were the leading obstacle to exchange development, replacing technology issues from six months prior.

As for their expected return on investment, the Boston Consulting Group predicts that exchanges in the largest US industries have the potential to earn $350 million to $450 million in annual revenues, while most B2B exchanges will generate revenues of less than $100 million. In total, by 2005 BCG expects online exchanges will generate $9 billion in revenues, with the market able to support only one to three major exchanges within any vertical industry segment.

Consortia B2B Exchanges

Jupiter has counted 58 industry-sponsored marketplaces that have been founded during the year 2000. By comparison, eCommerce Business magazine, which tracks newly formed consortia exchanges, announced in December that they had counted 62 of these industry sponsored exchanges.

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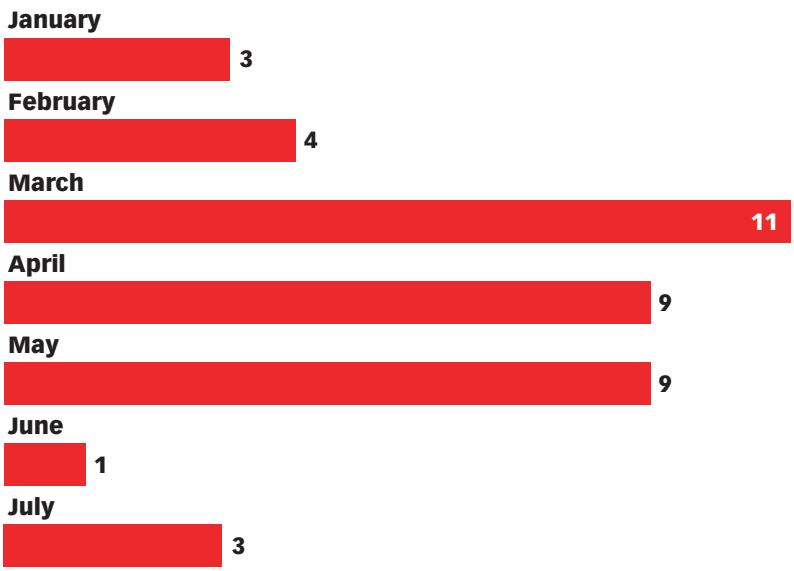
Number of Consortia Exchanges Announced, January–July 2000



Source: Jupiter Communications, 2000

In late October of 2000, Jupiter found that as many as 41% of the B2B exchanges that it had contacted were conducting transactions online, with an additional 33% of consortia marketplaces expecting to be live by the end of the year.

Consortia Exchanges with Transaction Capabilities, 2000

Source: Jupiter Communications, 2000

One of the benchmark consortia exchanges is Covisint, a massive business-to-business auto marketplace for as many as 40,000 companies doing business with the automobile industry. By mid-December 2000, Covisint claimed that it already had more than 100 catalogs posted on its website with 1,500 users accessing product information at its exchange. As for transaction capabilities, the co-CEO of Covisint, Rico Digirolamo, estimated that more than 100 auctions had already occurred since the soft launch of the auto industry exchange in October, valued at more than $350 million.

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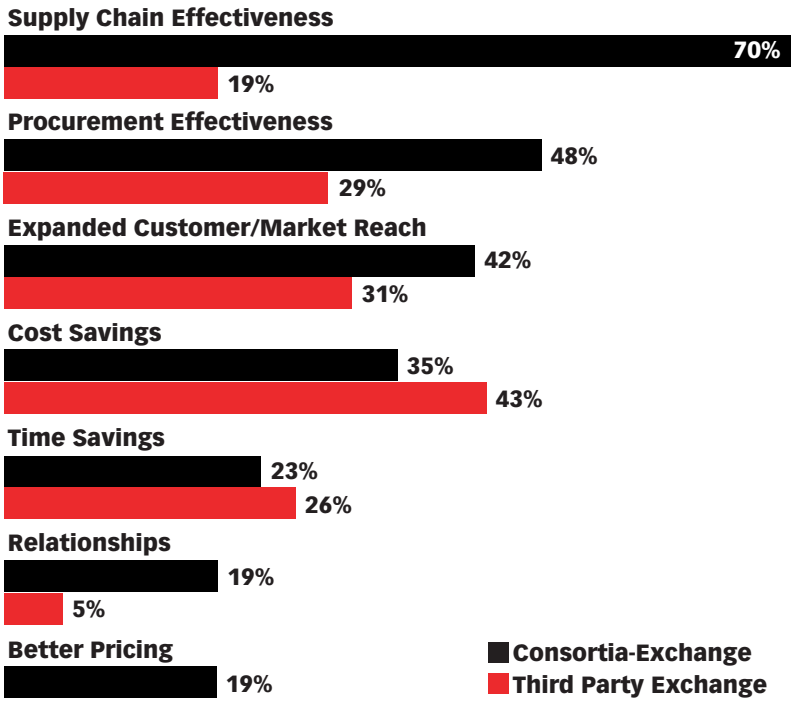
With more than 2,000 companies expected to be transacting via its exchange by the end of 2001, Covisint has found that its second and third tier suppliers have had an easier time of enabling themselves to participate in the exchange than their tier one counterparts. This is due to the relatively large size of tier one suppliers, who are having a more difficult time integrating the new exchange systems with their large internal information systems. Nonetheless, this is an adaptation that many firms will be forging ahead with as they expand their e-commerce capabilities.

Of the 30 consortia exchanges that Jupiter surveyed in October, 85% expected that their online exchange platforms would be able to connect with back-end systems. This ties in to the perception that consortia exchanges stand out as offering significant value for supply chain management.

Primary Value Expectation of B2B Consortia and Third-Party Exchanges, 2000



Source: Jupiter Communications, 2000

As an example of one consortia exchange's ownership structure, the aerospace industry's Exostar shows how founding partners are typically willing to share ownership with their technology partners. Jupiter has noted that 30% of consortia exchanges had ownership from both buyers and suppliers.

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Exostar: Example of a Consortium Exchange's Ownership Structure

Boeing	20%
Lockheed Martin	20%
Raytheon	20%
BAE Systems	20%
Commerce One (Techology Partner)	5%
Management and employees	5%

Source: Bear Stearns, 2000

Despite reports of growing activity, AMR Research has predicted that consortia-led exchanges will handle less than 15% of all procurement during the next two to three years. The research firm expects that the limits of transaction capabilities on most consortia exchanges will be for auction, spot-buy and excess inventory services.

Further complicating the process of moving beyond the demonstration phase of exchange transactions, AMR has also found that many consortia exchanges have not yet agreed where trading mechanisms should reside; behind proprietary firewalls, or in front of the firewall.

Of the four benchmark consortia exchanges profiled by B2B magazine *Line56*, only the technology industry's exchange, Converge (formerly eHitex), was regularly conducting online transactions. The other three exchanges had conducted limited tests for basic indirect procurement purchasing; a capability that most companies have been rapidly able to implement. Nonetheless, the year 2001 is when all four exchanges expect to be up and running with regular transactions.

Trading Capabilities of Leading Consortia Exchanges, 2000

	Transaction Capability	First Transaction Date
Covisint	Tested for indirect procurement and auto parts sales	September 29th, 2000
Transora	Tested for indirect procurement	August 2000
Converge (formerly eHitex)	Currently running reverse auctions for direct procurement items	July 31st, 2000
Exostar	Tested for indirect procurement	October 3rd, 2000

Source: Line56 Magazine, 2000

Technology exchange e2open was said to have been conducting $100 million in transactions per month by the end of 2000. Part of its success at moving quickly may have to do with its ownership structure, which has limited its founding participants' equity stake to 50% and relied upon the leadership of technology-provider IBM and its exchange-building partners Ariba and i2 Technologies.

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Another of the early successes among consortia exchanges is the WorldWide Retail Exchange. This marketplace had 53 of the largest retailers in the world in its membership as of December 2000, with more than 100,000 suppliers, retailers and distributors are among its participants from all over the world.

In a December profile by *Line56* magazine, the WorldWide Retail Exchange was compared to the GlobalNetXchange, a rival retail industry exchange founded by Sears and Carrefour along with technology partner Oracle. While the latter has been focused upon generating profits, the WorldWide Retail Exchange has declared itself a non-profit entity, with its primary focus upon creating value for its members.

Comparing Retail Consortia: Worldwide Retail Exchange vs GlobalNetXchange, 2000

	GlobalNetXchange	Worldwide Retail Exchange
Ownership	Sears, Carrefour, Oracle	17 founding members, including CVS, Safeway, Auchan Group, Marks & Spencer and Royal Ahold
Combined Sales	$200 billion	$596 billion
Technology Rollout	Conducting reverse auctions regularly	Pilot auctions conducted, active by Q1 2001
Major Difference	For profit, aiming for IPO	Not-for-profit

Source: Line56, 2000

As a strategy for success, the WorldWide Retail Exchange may become the predominant model. As A.T. Kearney has noted, consortia exchanges primarily create value through the efficiencies that they generate via supply chain management and the streamlining of the buying process. This in part explains why the construction of B2B exchanges is being driven by large enterprises that do a great deal of purchasing.

A.T. Kearney suggests that B2B exchanges should be likened to ERP systems, in that they are technology infrastructure that will deliver productivity and process efficiencies over the long term, which will be of primary use to their principal users.

To the extent that exchanges can capture revenues via transactions, they will be able to obtain some income. However, because the greater part of exchange value comes from process-oriented efficiencies, over the long term, consortia players will see these exchanges as technology solutions, not businesses.

This view is echoed by the Boston Consulting Group, which sees transaction revenues declining in importance over the coming years from 85.2% of revenues today to under 40% by 2005.

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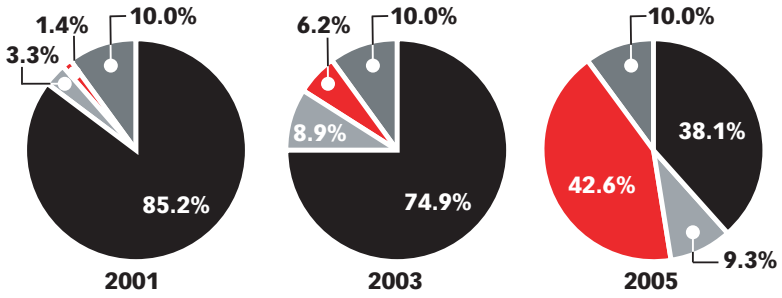
Large B2B Exchange Revenue Sources, 2001, 2003 & 2005



Note: Based on a generic industrial goods market with about $500 billion in gross purchases, online and offline
Source: Boston Consulting Group, 2000

Turning to another consortium-led marketplace, consumer packaged goods exchange Transora plans to be fully operational by 2001. Indirect procurement items will lead the purchasing activity, with 50% of participants' products being purchased via the exchange. Ten percent of direct procurement items are also expected to be purchased via Transora.

What is interesting to note about Transora, however, is that this consortium exchange is already forging links with other B2B exchanges. Third-party exchanges FoodTrader and Novopoint have forged alliances with Transora, while eBreviate is providing the consortium exchange with its reverse auction technology. In January 2001, Transora announced that it was forging ties with the consortia-led GNX to form what was dubbed the first "mega-exchange."

Example of a Hybrid Consortium Exchange: Transora

Ownership	More than 50 Consumer Packaged Goods companies, including HJ Heinz, Coca-Cola and Johson & Johnson, Unilever, Nestle, Cadbury Schweppes, General Mills, Eastman Kodak
Reverse Auction Feature	Provided by eBreviate
Links to Independent Exchanges	FoodTrader, Novopoint
Link to Private Exchange	StaplesLink

Source: eCommerce Business Research, 2000

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Once again, within the consortia-exchange community there is a return to the common theme among business-to-business players: While the buyers are showing up to purchase, the suppliers are still not yet ready to sell via the internet. According to *Line56* magazine's profile of Converge, as much as 80% of the exchange's participating suppliers require orders to be placed by phone or fax.

Third-Party B2B Exchanges

Perhaps the greatest accomplishment of the third-party exchanges has been their success at scaring the largest brick-and-mortar companies online in significant numbers. The dot-com hordes were at the gates in the fall of 1999, and the old economy companies felt that they had to defend themselves. They did so successfully.

Following the stream of press releases by consortia-led exchanges during the first half of 2000, many third-party exchanges have since changed their business models to become software providers, consultants, or application service providers (ASPs).

For the increasing number of third-party exchanges that are moving into the business of providing software solutions, the market for exchange software platforms is projected by Salomon Smith Barney to grow from $100 million in 1999 to $2.8 billion by 2004.

Estimated Worldwide Revenues for B2B Exchange Software Platforms, 1999 - 2004 (in billions)

Source: Salomon Smith Barney, 2000

Among those third-party exchanges that have switched to become technology providers, research done by the Electronic Market Center has found that leading exchange-platform vendors are selling their products using a combination of fees and charges. In the example below, the 3% transaction fee would be calculated as a share of transaction revenues.

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Typical Pricing Model for an Exchange Platform, 2000

License Fee (one time payment)	$300,000
Yearly Maintenance Fee	18% of above fee
Revenue Sharing	3% of transaction fees, with a $10,000 monthly minimum

Source: Electronic Market Center, 2000

Taking their exchange expertise a few steps further, several third-party exchanges have become marketplace services companies, offering technology, consulting, and integration services. This is a new market that IDC has dubbed, the "e-market services" industry.

In its projections for the size of the global market for e-market services, IDC includes support services such as consulting, integration, design, and operations management services (including hosting, network, and appliance maintenance.) It does not include value-added services such as financial, logistics, marketing, and content management. By 2003-2004, IDC predicts that this market could exceed $15 billion.

Global Market for Online Market Services, 1999 & 2000 (in billions)

Source: IDC, 2000

IDC has found that in 1999, the biggest customers of e-market services companies were the exchanges themselves. But as customers begin to link up to established exchanges, these companies will be able to generate increasingly greater revenues through integration services. IDC predicts that these revenues will account for as much as 50% of e-market service firms' total revenues by 2004.

So what went wrong for several of the former B2B darlings of Wall Street?

A study by the Yankee Group found that part of the problem for third-party exchanges had to do with scalability. The research firm estimates that up to 70% of independent marketplaces were not using packaged marketplace software to run their exchanges. Instead, most of these startups had developed their own web-enabled software that ran on a single application server.

If and when their exchange-concept took off, scalability problems would occur because of the need to shift to a full marketplace platform able to support larger numbers of buyers and sellers. In brief, many of these companies were long on concept, but short on technology – thus leaving them vulnerable to new market entrants.

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Whatever initial promise independent exchanges had shown was therefore quickly swept aside as brick-and-mortar companies began to announce their rival consortia-led exchanges. As a result, gaining liquidity became a major problem for third-party exchanges, and few had the chance to barely get off the ground.

Chemdex was once considered to be one of the most promising B2B exchanges, until its closure in December 2000.

Founded in 1997, Chemdex served the $12 billion life sciences research products market. This fragmented industry was devoid of a threat from consortia players, with over 3,000 pharmaceutical and biotechnology companies, 5,000 product suppliers and 250,000 lab scientists in the United States alone.

According to *Information Week*, Chemdex served more than 140 customers and 2,200 suppliers at its peak. The marketplace was closed down by its holding company Ventro, which cited the high cost of running a B2B marketplace as the reason for shutting it down.

Chemdex: Estimated Exchange Participation

Customers	140
Suppliers	2,200
Market Size	$12 billion

Source: Information Week, 2000

Analysis by AMR research found that potential customers were reluctant to join Chemdex because the company required long-term membership commitments from potential buyers. Exchange-related service contracts were estimated by AMR Research to cost between $20 million and $30 million.

Despite the absence of a consortia threat, Chemdex did face competition from a rival independent exchange, SciQuest. The business model for SciQuest has differed from that of Chemdex, however, in that it has always been a builder of private exchanges – a business model that the parent company of Chemdex, Ventro, has adopted as of late 2000.

One of the most significant lessons learned by independent exchange operators has been the fact that it is value-added services, and not transaction revenues, that are the true income generators of exchanges.

As business.com has reported, a $1,000 transaction costs as much to process as a $10 million transaction once the initial cost of software is considered. Companies will not be willing to pay high fees for transactions that they will eventually see as part of a technology solution. There is little incentive for businesses to join a third-party exchange unless they obtain a significant ownership stake in the technology solution that they are helping to support.

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While there remains a significant opportunity for exchanges that support near-commodity goods and spot markets, these marketplaces rely upon high volume, low-cost transactions. Over the long term, even these exchange operators will need to provide value-added capabilities ranging from technology consulting to credit and settlement services to improve their profit margins.

Among the value-added services that exchanges are expected to be able to offer are invoicing, payment, logistics fulfillment, and online contract negotiations. The Meta Group believes that it will be another 18 months, or until mid-2002, before such applications become commonplace.

Despite the negative outlook for many third-party exchanges, there are some that are successfully getting the job done. Investment bank Credit Suisse Boston still estimates that 40% of B2B e-commerce will move through third-party exchanges.

Examples of Third Party Marketplaces, 2000

	Industry	Members
Dexpo.com	Dental Supplies	120,000 private-practice dentists, 1,000 manufacturers, 200 distributors
PartsDriver.com	Aftermarket auto parts	210,000 repair shops, 80,000 jobbers, 600 parts manufacturers

Source: IMT Strategies, 2000

As an indication of the cost and time required to establish a third-party exchange, the Butler Group has done a case study of MetalSite. This independent exchange is by some accounts not really a third-party exchange; it was spun off as an independent company from three steel industry players back in 1998, long before the concept of consortia exchanges had been described.

Despite its ties to the old economy, MetalSite has done its best to maintain its neutrality. By mid-year 2000 it had signed up over 22,000 users.

Case Study of MetalSite Operations, 2000

Estimated time to complete exchange infrastructure	5-10 years
Estimated cost to build exchange infrastructure	$100-200 million
Number of users, end 1999	10,000
Number of users, mid-2000	22,000
Number of monthly transactions, autumn 2000	7,000

Source: Butler Group, 2000

Many of its value added services are still being developed, however, with the company expecting that it will take up to ten years to complete. In order to circumvent international trade barriers, the company operates MetalSite Japan, and has partners in Europe and Latin America.

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One success story among the independent exchanges is Altra Energy, a business-to-business exchange that facilitates online spot market transactions for the energy industry. According to company reports, Altra Energy has more than 7,000 marketplace participants conducting over 11,000 transactions per month.

Altra Energy: Monthly Transactions, September 2000

Electric Power	2,500
Natural Gas	9,000

Source: Altra Energy, 2000

With the average dollar volume of each transaction at $180,000, profits were $40 million in 1999. The projected value of transactions for the year 2000 was estimated to be between $25 billion and $26 billion.

Part of the success behind Altra Energy has been the exchange's inclusion of offline intermediaries, according to Rusty Braziel, the company's founder and chairman. While several business-to-business exchanges talked of getting rid of the middleman, Altra Energy understood that intermediaries play a crucial role as the "grease that keeps a market moving."

Distributors, brokers, and traders all perform a valuable function in commercial exchange because they smooth out market inefficiencies. For example, an intermediary may bridge the timing between a seller who wants to unload a product on a Monday and a buyer who does not arrive in the market to buy until a Wednesday. Other intermediaries arrange short-term financing, move product from one location to another, or provide confidentiality to market participants.

Altra Energy has also recognized that market participants must be brought online gradually. Most companies prefer to move from their phone and fax networks to a hybrid model of internet and offline trading, before moving the majority of their trading online.

Private B2B Exchanges

The Gartner Group estimates that at the end of 2000, there were 30,000 private exchanges in development worldwide. AMR predicts that more than 75% of business-to-business e-commerce will flow through private exchanges over the next two years.

In eMarketer's July B2B Report, we concluded that it was yet to be determined whether large corporations would choose to manage their online purchasing collectively with their consortium partners, or on their own.

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Now that more time has elapsed, it has become clear that the value of business-to-business e-commerce lies within the long-term benefits gained through supply chain management. Businesses have also determined that the internet provides them with the opportunity to better manage customer relationships.

Because these two elements of e-commerce strategy include a great deal of proprietary information and require technology customization, it is clear that there will be some degree of private exchange activity conducted by most companies.

This does not mean that public or consortia exchanges are about to disappear. It does mean, however, that their role will likely be scaled back from their original vision as dynamic trading hubs intended to conduct the majority of transactions within an industry.

What prevents businesses from entirely retreating within their own networks is the cost of private exchanges which are expensive to establish and operate. AMR Research has reported that i2 Technologies is quoting proposals at greater than $100 million as the cost to build these exchanges.

Among those private exchanges that are held up as leaders, most have evolved slowly over time. And in several cases, the exchanges were constructed with the customer in mind, with a focus upon improving service and communications. From these innovations sprung internal process efficiencies that wound up saving their operators millions of dollars.

Top Three Private Exchanges by Sales, 1999

Intel	$10.50 billion
Cisco	$9.50 billion
IBM	$8.84 billion

Source: Interactive Week, 2000

Following its pledge from 1999, IBM has continued to move aggressively in bringing more of its customers and suppliers online. Sales through the third quarter of 2000 have reached as high as $14.6 billion, nearly doubling the online sales of 1999.

Internet-Based eCommerce Activity through Q3, 2000

Online Sales	$14.6 billion
Estimated Savings	$1.4 billion
Online Purchasing	$28 billion
Estimated Savings	$247 million

Source: IBM, 2000

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As an alternative to building a consortium exchange, several companies have paired up with one or two supply chain partners within a small vertical niche. In some cases, these private exchanges have evolved into consortium exchanges.

For example, what has now become a consortium exchange being built with convenience store suppliers McLane's and Phillip Morris, Chevron's RetailersMarketExchange was originally conceived as a private exchange for linking the company's 34,000 convenience store employees via a single intranet. At a cost of $23 million to build, this private exchange was expected to save Chevron more than $10 million annually.

Case Study of Chevron's Convenience Store Exchange, 2000

Start date:	1997
Cost of intranet:	$23 million
Number of Chevron employees connected:	34,000
Expected annual savings:	$10 million

Source: Roland Berger, 2000

Despite the infrastructure cost savings that are offered through consortia-exchanges, not all large companies have found it preferable to develop an exchange with industry competitors. One example is Toyota, which is developing its own private exchange called iStarXchange, using i2 Technologies as its technology provider. This exchange has a focused mission, to link Toyota dealers, managers, and parts suppliers within a Toyota-centric system.

But as the majority of survey data clearly indicate, most large companies expect to be using multiple exchanges and different exchange models to connect with their suppliers and customers. The majority of large enterprises will participate in a consortium exchange for spot-market and auction purchases, but turn to their private exchanges for supply chain management.

An example of an early adopter that has taken a hybrid approach with its e-commerce initiatives is Eastman Chemical. This company has conducted bilateral trade with its trading partners' websites, used its own private website, and traded through two separate third-party exchanges.

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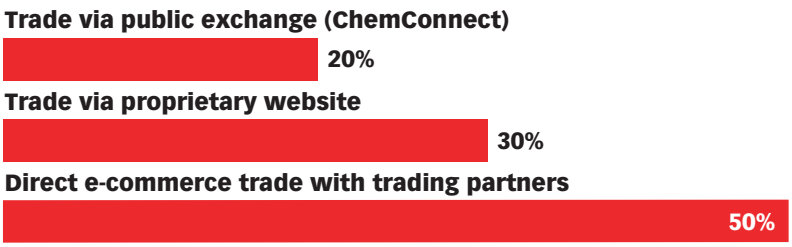
Case Study of Eastman Chemical, Projected Online Activity by 2003



Source: IMT Strategies, 2000

The Aberdeen Group has further studied Eastman Chemical, finding that on a pilot-project for purchasing $700,000 in indirect procurement items, the chemical company achieved a 126% return on investment. Commerce One's bilateral e-procurement solution BuySite and its MRO exchange MarketSite were used to make the purchases.

Eastman Chemical Cost and Time Savings via Online Procurement, 2000

Total Company MRO Needs: $900 million annually, from 3500 MRO suppliers
Former MRO Administration: $115 per order, 19 days for fulfillment
Results of Pilot Online Procurement Program:
5% reduction in prices paid by bringing purchases on contract
Order cycle reduced to 24 – 48 hours
Two purchasing department positions eliminated, for savings of $100,000
Reduced inventory for lab supplies, savings of $250,000
Source: Robertson Stephens, Aberdeen Group, 2000

IMT Strategies found that after nine months of operations for Eastman Chemical's private online storefront, the company had sold $10 million in product with over 500 registered customers. Eastman Chemical has also accounted for 13% of sales on ChemConnect, an exchange in which it has taken an equity stake.

eMarketer foresees strength in this hybrid model. In most cases, the public exchange will serve as the central gateway for separate private trading exchanges controlled by individual consortium partners. In other cases, the consortium exchange may take a secondary role, as one of several alternate means of conducting online transactions, and as a complement to a private exchange.

The line has not yet been drawn, however, between individual companies' private online operations, and the role of the consortia exchanges. Where this line is drawn will vary from consortium exchange to consortium exchange, but eMarketer believes that for the most part, direct procurement and key customer relationships will remain on the private side of that division. Consortia-led exchanges will therefore become one of several channels that major firms use to manage their online purchasing.

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