



U.S. Small Business Administration  
Office of Advocacy

June 2000

# Small Business Expansions in Electronic Commerce

*A look at how small firms are helping shape the fastest  
growing segments of e-commerce.*

## Foreword

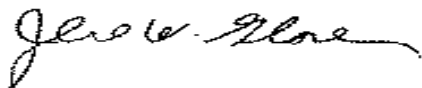
American small businesses have been entering the world of electronic commerce in large numbers, as both developers and beneficiaries of the systems that are revolutionizing business practices. “Connectivity” is the watchword of this new era—and small firms are connecting rapidly.

I am pleased to release *Small Business Expansions in Electronic Commerce*, a brief survey of available data on one of the fastest growing sectors in the economy. Government statistics in this area continue to be limited. In an effort to document the growth of e-commerce, therefore, the Small Business Administration’s Office of Advocacy assembled primarily private sector market research for this report.

If current trends continue, some estimates say, 85 percent of small firms will be conducting business over the Internet by the year 2002. Business-to-business e-commerce, while still a small aspect of this new economy, is growing rapidly; some project a compound annual growth rate of 41 percent over the next five years. It is still unclear which small business sectors will benefit most from these trends—and which will face new barriers. A number of related policy issues are under discussion.

The Office of Advocacy’s Office of Economic Research supports a better understanding of the role small firms play in the economy by identifying small business contributions, assessing regulatory impacts, and monitoring small firm financing. The office conducts its own studies and contracts with researchers to examine various aspects of the small business economy.

I encourage anyone interested in small business statistics to visit our Web site at <http://www.sba.gov/advo/stats>. If you have comments or questions about this report or its subject matter, please do not hesitate to contact us; the author is Victoria Williams at (202) 205-6530 or [victoria.williams@sba.gov](mailto:victoria.williams@sba.gov).



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## **Executive Summary**

The availability of business-to-business electronic commerce has introduced rapid and unprecedented change in the ways business is conducted. In an effort to track this phenomenon, economic researchers in the U.S. Small Business Administration's Office of Advocacy have analyzed the most recent available data on Internet infrastructure and compiled the findings in *Small Business Expansions in Electronic Commerce*. The report builds on earlier Office of Advocacy research in *E-Commerce: Small Business Ventures Online*. The data are from several sources, most of which are non-government consulting firm studies. These sources all indicate that small business spending on information technology and Internet-related products continues to increase as they embrace this new medium. Highlights from this report include:

- Eighty-five percent of small businesses are expected to conduct business via the World Wide Web by the year 2002.
- The more than 7,100 Internet service providers (ISPs) in 2000 represent a 41 percent increase from a year ago. Most ISPs have fewer than 12 employees.
- The U.S. ISP market generated an estimated \$15 billion in receipts in 1998, compared with \$4 billion in the European ISP market.
- In 1999, small businesses with 5-99 employees spent about \$9 billion for network hardware; businesses with 100-999 employees spent an estimated \$14 billion.
- Some 85 percent of businesses with fewer than 100 employees had personal computers in 1999; more than 61 percent of these had access to the Internet.
- Firms with fewer than 10 employees invested more aggressively in e-commerce infrastructure than larger firms.
- Home-based businesses on average invest about \$1,100 on Internet technology; very small businesses with fewer than 5 employees spend about \$1,500 annually.
- In 1998, 60 percent of venture capital disbursements went to information technology industries.

- Information technology-producing industries contributed more than one-third of total real economic growth between 1995 and 1998.
- More than 65 percent of business-to-business purchases will be made by six sectors in 2003 – retail trade, motor vehicle manufacturing, shipping, industrial equipment, high-technology sectors, and government.
- By 2003, business-to-business electronic commerce will account for almost 24 percent of total business-to-business commerce.
- Business-to-business e-commerce will increase at a compound annual growth rate of 41 percent over the next five years.
- Many policies will need reconsideration in the new world of electronic commerce. Among them are concerns about taxation of goods and services sold over the Internet; privacy issues; Internet fraud; patent, copyright, and trademark issues; domain names; international management of the Internet, including legal concerns; dispute resolution; digital signatures and electronic contracting; encryption controls; network integrity and security; and antitrust concerns.

*Small Business Expansions in Electronic Commerce* was prepared by Victoria K. Williams of the Office of Advocacy's Office of Economic Research under the general direction of Bruce D. Phillips, director of economic research. Kathryn J. Tobias edited the report. Comments on the contents of the report may be directed to the Office of Economic Research at (202) 205-6530. Visit Advocacy's home page at <http://www.sba.gov/advo/stats> for additional information about small businesses.

## Introduction

Electronic commerce, commonly called “e-commerce,” continues to revolutionize the traditional ways of conducting business.<sup>1</sup> The rapid growth, especially of business-to-business e-commerce, is unprecedented. A previous Office of Advocacy report titled *E-Commerce: Small Business Ventures Online* provided an overview of the phases through which small businesses enter into the world of e-commerce. It also examined their usage of the Internet and found that, as of late 1998-early 1999, e-commerce was still among the least common small business uses of the Internet. In the brief period since that time, as this report will show, small firms have entered the world of e-commerce in increasing numbers.

This report focuses on several distinct but connected aspects of e-commerce: the infrastructure of the Internet economy, the global small business infrastructure, and policy issues likely to affect small businesses in e-commerce. The first section looks at the e-commerce infrastructure, including the ways it enables businesses to function as both suppliers and consumers of goods and services. The second section touches on the international e-commerce infrastructure, briefly comparing U.S. spending on electronic commerce with that of the rest of the world. The third section reflects on constraints small businesses are likely to encounter and lists policy issues that may affect small firms both domestically and internationally.

The goal of this report is to analyze the growth of small business electronic technology and inform small businesses, advocates, and policymakers of recent developments. A key finding is that small businesses are important consumers of information technology (IT) products and services, and as providers of such products, they are continuously creating jobs and supplying electronic resources to other small firms.

Small businesses have been a contributing force to the Internet, e-commerce, and information technology, producing more than 70 percent of the new information

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<sup>1</sup> E-commerce in this report refers to any form of electronic transaction that is done for the enhancement of a business or its profits.

technology jobs between 1992 and 1996.<sup>2</sup> They participate in the Internet infrastructure as both suppliers and buyers of information technology products and services.<sup>3</sup> The Internet, along with affordable telecommunications, has inspired and enabled small businesses to reach wider markets that were only dreamed of a decade ago. However, potential users who are trying to engage in on-line commercial transactions must be able to access and use the network infrastructure, which includes access to information technologies such as hardware, servers, and software.

Measurement of the new economy of information technology and e-commerce continues to be hampered by difficult definitional issues and the limited availability of government data. The first official government data on e-commerce, released by the Department of Commerce in March 2000, estimated retail e-commerce sales at \$5.3 billion in the fourth quarter of 1999. The agency plans to make e-commerce sales data available each quarter.

Data in this report have been obtained from several sources, primarily market research firms. Consequently, the data are not uniform, since different firms have different ways of defining small businesses and use different measurement techniques. The maximum size of a small business, as defined by various researchers, ranges from 3 to 499 employees.<sup>4</sup>

Thus, the findings vary from source to source and readers should take this into account in interpreting the results. Regardless of the source, however, there is consensus that small businesses are making rapid progress in the use and advancement of electronic commerce. They are revolutionizing the business of business.

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<sup>2</sup> Richard J. Boden, *Establishment Employment Change and Survival, 1992–1996*, prepared under contract for the U.S. Small Business Administration, Office of Advocacy, February 2000. (See [www.sba.gov/advo/stats](http://www.sba.gov/advo/stats).)

<sup>3</sup> Internet infrastructure in this report refers to the basic hardware and software (including networks) required to access the Internet.

<sup>4</sup> For example, the U.S. Small Business Administration, Office of Advocacy, generally uses a cutoff of fewer than 500 employees in its definition of small business. Access Media, Inc., and International Data Corporation use fewer than 100 employees; Cahners defines small businesses as having 5 to 99 employees and small office/ home office (SOHO) businesses as those with fewer than 5 employees.

## The Infrastructure of the Internet Economy

The Internet infrastructure consists of computers, software, Internet service providers (ISPs) or Internet access, Internet-enabled businesses, high-speed Internet connections, and the high tech innovators that make electronic connectivity possible.<sup>5</sup> Fixed-line communications, cable television, cellular mobile networks, satellites, broadcasting networks, and electricity distribution networks are prerequisites for the World Wide Web and the Internet.<sup>6</sup>

The Internet economy indicator, which was created and issued by the Center for Research in Electronic Commerce at the University of Texas, consists of four layers: Internet infrastructure, application infrastructure, an intermediary layer, and the Internet commerce layer.<sup>7</sup>

- *The Internet infrastructure layer* is made up of companies that provide products and services to create Internet provider (IP) network infrastructure, for example, Internet backbone providers, Internet service providers, security vendors, fiber optic makers, line acceleration hardware manufacturers, and telecommunications companies.
- *The Internet application layer*, made possible through the Internet infrastructure layer, in turn enables business activities to be performed online. This layer provides software production and services to facilitate Web transactions. Involved in this layer are Internet consultants, inter-commerce applications, multimedia applications, web development software, search engine software, Web databases, and online training.
- *The Internet intermediary layer* increases the efficiency of electronic markets by facilitating the meeting and interaction of buyers and sellers over the Internet. Firms in this category act as a mechanism through which transactions are processed through the previous two layers and changed into business

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<sup>5</sup> Nathan Associates, *The New High-Tech Entrepreneurs* (Washington D.C., 1998), 2-3.

<sup>6</sup> "Dismantling the Barriers to Global Electronic Commerce," 1997. See <http://www.oecd.org/dsti/sti/it/ec/prod/dismantl.htm>.



transactions. Categories in this layer include online travel agents, such as TravelWeb.com; brokerages, such as E\*Trade; creators of online advertising; and Internet ad brokers and portal/content providers, such as Yahoo and Excite.

- *The Internet commerce layer* deals with the sales of products and services over the Internet to consumers or businesses. This includes, for example, “e-tailers,” manufacturers selling online, subscription-based companies, online entertainment and professional services firms, and airlines selling tickets online.

The Internet economy generated an estimated \$301 billion in revenue and added more than 1 million jobs in 1998.<sup>8</sup> The Internet infrastructure layer contributed the most in revenues during the first quarter of 1999, while the Internet commerce layer added the most jobs to the economy over the period.<sup>9</sup> In addition, more than one-third of the total real economic growth between 1995 and 1998 came from a variety of information technology-producing industries (Table 1).<sup>10</sup>

A study titled *The New High-Tech Entrepreneurs* divided the computer industry into three horizontal layers: hardware, software, and services. Hardware consists of computers, servers, routers, disk drives, and scanners. Software deals with packaging, operating systems, word processors, spreadsheets, and database management. Services involves designing, installing, consulting, Internet hosting, and accessing.<sup>11</sup> To date, the small business contributions to each layer have not been measured.

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<sup>7</sup> The Internet Economy Indicator was created by the University of Texas. For more information, see <http://www.internetindicators.com/indicators.html>

<sup>8</sup> *Ibid.*

<sup>9</sup> *Ibid.*

<sup>10</sup> U.S. Department of Commerce, *The Emerging Digital Economy II*, June 1999. IT industries are listed according to Standard Industrial Classifications. See also the most recent edition, *Digital Economy 2000*, June 2000. (See [www.ecommerce.gov](http://www.ecommerce.gov))

<sup>11</sup> *The New High-Tech Entrepreneurs*.

**Table 1**


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**Information Technology Producing Industries**


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*Hardware Industries*

Computers and equipment  
 Wholesale trade of computers and equipment  
 Retail trade of computers and equipment  
 Calculating and office machines, nec  
 Magnetic and optical recording media  
 Electron tubes  
 Printed circuit boards  
 Semiconductors  
 Passive electronic components  
 Industrial instruments for measurement  
 Instruments for measuring electricity  
 Laboratory analytical instruments

*Software/Services Industries*

Computer programming services  
 Prepackaged software  
 Wholesale trade of software  
 Retail trade of software  
 Computer integrated systems design  
 Computer processing, data preparation  
 Information retrieval services  
 Computer services management  
 Computer rental and leasing  
 Computer maintenance and repair  
 Computer related services, nec

*Communications Equipment Industries*

Household audio and video equipment  
 Telephone and telegraph equipment  
 Radio and TV and communications equipment

*Communications Services Industries*

Telephone and telegraph communications  
 Radio and TV broadcasting  
 Cable and other pay TV services

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Source: *The Emerging Digital Economy II*, U.S. Department of Commerce 1999.

***Internet Service Providers in the United States***

Although the data are derived from different sources, they all seem to tell the same story: the number of small businesses that are Internet service providers is increasing rapidly. In 1999, there were roughly 4,850 ISPs.<sup>12</sup> According to the *Washington Post*, the more than 7,100 ISPs in the United States in 2000 represent a 41 percent increase from a year ago.<sup>13</sup> Various academic and industry studies estimate that the number of providers will reach 10,000 in the next 2 to 3 years.<sup>14</sup>

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<sup>12</sup> Cahners In-Stat Group, "ISPs Rolling-Out xDSL are Creating High-Speed Stampede, Reports Cahners In-Stat Group," press release, December 2, 1999. See <http://www.instat.com>

<sup>13</sup> Ariana Eunjung Cha, "Small-Time Web Providers Do Big Business," *The Washington Post*, February 22, 2000. See <http://www.washingtonpost.com/wp-dyn/A5596-2000Feb18.html>

<sup>14</sup> *Ibid.*

According to the Census Bureau, there were 4,644 ISP establishments with fewer than 500 employees in 1997 and 3,115 in 1996.<sup>15</sup> *The Washington Post* reported that most ISPs had fewer than 12 employees.<sup>16</sup> According to Network Solutions, approximately 80 percent of its Internet domain name registrations in the .com, .org, and .net registries were to small businesses with between 2 and 499 employees.<sup>17</sup>

The ISP market consists of four segments, according to International Data Corporation (IDC), namely corporate access, individual access, wholesale access, and value-added services.<sup>18</sup> In 1998, the individual access segment generated the most revenues (\$4.7 billion), and it is predicted to maintain this position until 2003.<sup>19</sup> The ISP market was expected to see revenues rise by 41 percent between 1998 and 1999, and continued growth was projected at a compound annual rate of 28 percent through 2003.<sup>20</sup> Cahners In-Stat states that "Mom-&-Pop" ISPs have experienced tremendous growth because of the demand for Internet access by an estimated 66 million U.S. consumers.<sup>21</sup> Small business ISPs are growing and reaching wider markets. Most of this growth can be attributed to an increase in technology demand, fewer resources needed to launch an ISP, and the availability of skilled workers in Internet provider networks.

### ***High-Technology Jobs***

Small businesses are continuously creating jobs in the high-technology industry. According to a study by Nathan Associates, most new high-tech businesses in the United States are small, employing between 2 and 35 employees, with annual sales revenue of at \$150,000 at the lower end and generally less than \$2 million.<sup>22</sup>

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<sup>15</sup> U.S. Department of Commerce, Bureau of the Census. See <http://www.census.gov/econ/www/index.html>

<sup>16</sup> "Small-Time Web Providers Do Big Business."

<sup>17</sup> Cheryl Regan, spokeswoman for Network Solutions, Inc., November 30, 1999.

<sup>18</sup> International Data Corporation, "The U.S. Internet Service Provider (ISP) Market will Add Nearly \$4.5 Billion of Revenues Annually Over the Next Three Years," IDC Research, press release, April 19, 1999. See <http://www.idc.com>

<sup>19</sup> *Ibid.*

<sup>20</sup> "The Emerging Digital Economy II."

<sup>21</sup> Cahners In-Stat, "ISP Market to Reach \$23.6 Billion in 1999, Growing 68 Percent since 1998," press release, June 1999.

<sup>22</sup> *The New High-Tech Entrepreneurs.*

The high-tech entrepreneur industry added \$134 billion to the economy in 1997, with the services industry adding the largest share. High-tech entrepreneurs employed 2.2 million people in 1997, a 14.5 percent increase over the previous year.<sup>23</sup> The SBA's Office of Advocacy, in reviewing high technology occupations (scientists, engineers, computer programmers, and analysts), found that 37.9 percent of the 4.5 million such workers were in small firms with fewer than 500 employees in 1996.<sup>24</sup>

From 1992 to 1996, small firms with fewer than 500 employees accounted for 72 percent of the employment growth in information technologies, while firms with fewer than 20 employees accounted for 38 percent, according to a report prepared for the Office of Advocacy.<sup>25</sup> Another recent report for the Office of Advocacy, *The High-Tech Rural Renaissance*, found that the lack of high-tech infrastructure in rural areas has hampered high-tech growth there.<sup>26</sup>

### ***The Growth of Small Business Technology***

Increases in both demand for and supply of electronic services, as well as better access to capital, have helped drive the growth in small business technology. As computers become more available and less expensive, small businesses are finding the resources to join the new economy. Greater access to capital through the angel and venture capital markets has made it possible for high-technology small firms and entrepreneurs to develop more technological innovations.<sup>27</sup>

Angel and venture capital investments tend to be concentrated in information technology and in high-tech sectors such as biotechnology, computer networking,

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<sup>23</sup> *Ibid.*

<sup>24</sup> U.S. Small Business Administration, Office of Advocacy, "The Facts about Small Businesses 1999," May 1999. See <http://www.sba.gov/advo/stats>

<sup>25</sup> *Establishment Employment Change and Survival, 1992-1996.*

<sup>26</sup> Jed Kolko, *The High-Tech Rural Renaissance? Information Technology, Firm Size and Rural Employment Growth*, prepared under contract for the U.S. Small Business Administration, Office of Advocacy, July 1999. See <http://www.sba.gov/advo/stats>.

<sup>27</sup> Josh Lerner, "Small Business, Innovation, and Public Policy," paper presented at the Digital Economy Conference, 1999.

and the Internet. Sixty percent of venture capital disbursements were made to information technology industries in 1998.<sup>28</sup>

According to Cahners In-Stat, several forces are driving the growth in the small business market for network hardware:<sup>29</sup>

- Increased computing per firm – small businesses increasingly rely on computers to perform daily duties.
- Increased technical productivity – Small business decision-makers have a much better understanding of Internet networking than they had previously.
- Internet networks allow better sharing of Internet access and data lines.

Small businesses that use the Internet have grown 46 percent faster than those that have not, according to *American City Business Journals*.<sup>30</sup> Some 85 percent of U.S. businesses with fewer than 100 employees are personal computer (PC) users; more than 61 percent of them have Internet access.<sup>31</sup> According to IDC, Internet infiltration by small businesses was high in 1998, with approximately 67 percent accessing the Web; 85 percent are expected to conduct business via the Web by 2002.<sup>32</sup> A private annual business study finds that some 35 percent of small businesses maintained a Web site as of 1998 and one-third of those did business transactions through it.<sup>33</sup> Other estimates say that more than 1 million small businesses had a Web site in 1998,<sup>34</sup> while in 1999 an estimated 2.3 million small businesses (with fewer than 100 employees) were online.<sup>35</sup>

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<sup>28</sup> *Ibid.*

<sup>29</sup> "Internet Sparks Small Business Networking Sales." See [http://www.instat.com/rh/mm/sb9804ms\\_summary.htm](http://www.instat.com/rh/mm/sb9804ms_summary.htm)

<sup>30</sup> *American City Business Journals* quoted in "The Internet Economic Indicators Facts and Figures," at <http://www.internetindicators.com/facts.html>

<sup>31</sup> International Data Corporation, "Small Businesses Are Increasingly Turning to the Internet for PC Purchases," November 1999. See <http://www.idc.com/> .

<sup>32</sup> Michael J. Miller, "Create a Great Site," *PC Magazine*, vol 18. No. 11 (June 1999), 99, 100.

<sup>33</sup> The Dun and Bradstreet Corporation, 1998.

<sup>34</sup> Cahners In-Stat Group, "Internet Infrastructure and Commerce," March 1999. See <http://www.cahnersinstat.com>.

<sup>35</sup> "Create a Great Site."

## ***Small Business Technology Spending***

Small business spending on Internet-related products has increased in recent years, partly as a result of price reductions in information technology products. Business owners who are educated about IT feel comfortable spending on Internet products. Small businesses, among the fastest growing purchasers of IT products, spent an estimated \$156 billion on IT products in 1999.<sup>36</sup> In 1999, small businesses with 5–99 employees purchased network hardware worth about \$9 billion, while medium-sized businesses with 100 to 999 employees spent an estimated \$14 billion.<sup>37</sup> By 2000, approximately \$28 billion (about 30 percent of small business' cumulative technology budget) will be spent on Internet technologies and services, including Internet infrastructure, access charges, Internet business infrastructure, (for example, Web/e-mail servers or e-commerce applications) and other Internet services.<sup>38</sup>

In 1998, small office / home office (SOHO) businesses with fewer than 5 employees spent an estimated \$7.3 billion on computer hardware, and more than \$6 billion on software.<sup>39</sup> According to IDC, these small and home office businesses spent approximately \$51 billion on information technology products in 1998; the figure has grown to represent about 24 percent of all IT spending in the United States.<sup>40</sup> By 2002, about \$71 billion will be spent on IT by SOHOs (Figure 1).<sup>41</sup>

Businesses with 20 or more employees are expected to be more interested in the purchase of their own e-commerce infrastructure because doing so will enable

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<sup>36</sup> Cahners In-Stat Group, "Retailers Take Heed: Small Businesses Have \$156 Billion to Spend on Technology," July 1999. See [http://www.instat.com/pr/ms9902n1\\_pr.htm](http://www.instat.com/pr/ms9902n1_pr.htm).

<sup>37</sup> Cahners In-Stat Group, "1999 is the Year of the Small and Medium-Sized Business Network, Expected to Represent More than \$20 Billion in Network Hardware Opportunity," June 21, 1999. See <http://www.instat.com/pr/1999/small>

<sup>38</sup> Cahners In-Stat Group defined small business as a U.S. business with 5-99 employees in "Small Business: Internet Infrastructure and Commerce," March 1999.

<sup>39</sup> Cahners In-Stat Group "Internet Drives SOHO Technology Spending." See [http://www.instat.com/rh/mm/sh9802ms\\_summary.htm](http://www.instat.com/rh/mm/sh9802ms_summary.htm)

<sup>40</sup> International Data Corporation, "SOHO Market for Technology Tops \$51 Billion in 1998," April 1999.

<sup>41</sup> *Ibid.*

them to leverage the value of existing equipment, keep overhead costs down and increase profits, while utilizing the expertise of their technology-savvy employees.<sup>42</sup>

Firms with fewer than 10 employees invested more aggressively in e-commerce infrastructure than larger firms, according to Cahners.<sup>43</sup> On average, home-based businesses invest about \$1,100 on Internet technology; very small businesses with fewer than five employees spend about \$1,500 annually.<sup>44</sup>

In contrast, the average SOHO business (including non-home-based firms) spent about \$7,200 annually on information technology in 1998, up from \$2,000 in 1996.<sup>45</sup> A number of factors are driving SOHO technology spending:<sup>46</sup>

- Awareness of technology because of increased use of the Internet.
- Lower PC prices and adoption of PCs to facilitate Internet access.
- The urge to use technology-enabled business strategies.
- The availability of products designed and priced specifically for the SOHO market.

## ***E-Commerce***

The prerequisites for the infrastructure of the Internet have made it possible for electronic transactions to occur, with business-to-business (B2B) e-commerce taking the lead. The first official government data on e-commerce were released by the U.S. Department of Commerce, which estimated retail e-commerce sales at \$5.3 billion or 0.64 percent of total retail sales in the fourth quarter of 1999 (Figure 2).<sup>47</sup> The Commerce Department's estimated figure does not include sales from travel services,

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<sup>42</sup> Cahners In-Stat Group, "Internet Infrastructure and Commerce," *Internet Spending, Small Business 1998*, March 1999, 21. Small businesses have 5–99 employees. See [www.cashnersinstat.com](http://www.cashnersinstat.com)

<sup>43</sup> *Ibid.*

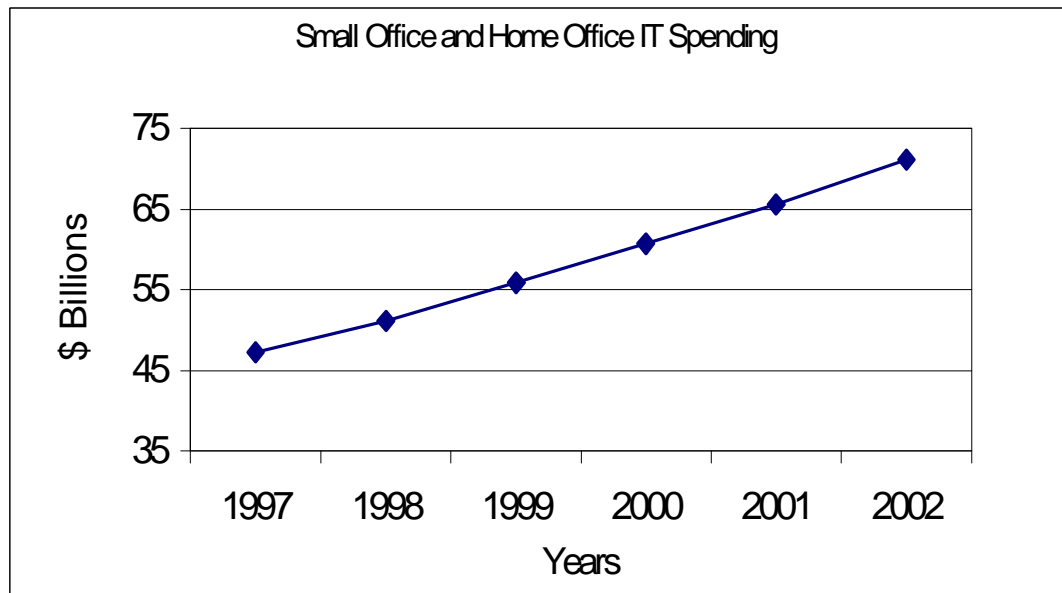
<sup>44</sup> *Ibid.*

<sup>45</sup> Cahners In-Stat Group, "Internet Drives SOHO Technology Spending:" [http://www.instat.com/rh/mm/sh9802ms\\_summary.htm](http://www.instat.com/rh/mm/sh9802ms_summary.htm)

<sup>46</sup> *Ibid.*

<sup>47</sup> U.S. Department of Commerce, Bureau of the Census, "Retail E-Commerce Sales for The Fourth Quarter 1999 Reach \$5.3 Billion," news release, March 2000. See <http://www.census.gov/mrts/www/mrts.html>

**Figure 1**



Source: Prepared by the Office of Advocacy, based on data from IDC, April 1999.

financial brokerages, and ticket-sales agencies. Although e-commerce is miniscule compared with the rest of the economy, it is the fastest growing technological innovation.

In 2000, small businesses in the United States are expected to generate 30 percent of their annual income online, according to Cahners In-Stat.<sup>48</sup> According to IDC's Internet Commerce Market Model (ICMM), B2B e-commerce by small businesses in the United States is expected to be \$23.5 billion in 2000.<sup>49</sup> In 2000, 28 percent of B2B purchases will be by North American small businesses, according to IDC's ICMM. Sixty-one percent of small businesses are expected to be connected online, with only 16 percent of them having connection through a high-speed network in 2000.<sup>50</sup> The transaction value of B2B e-commerce over the Internet is

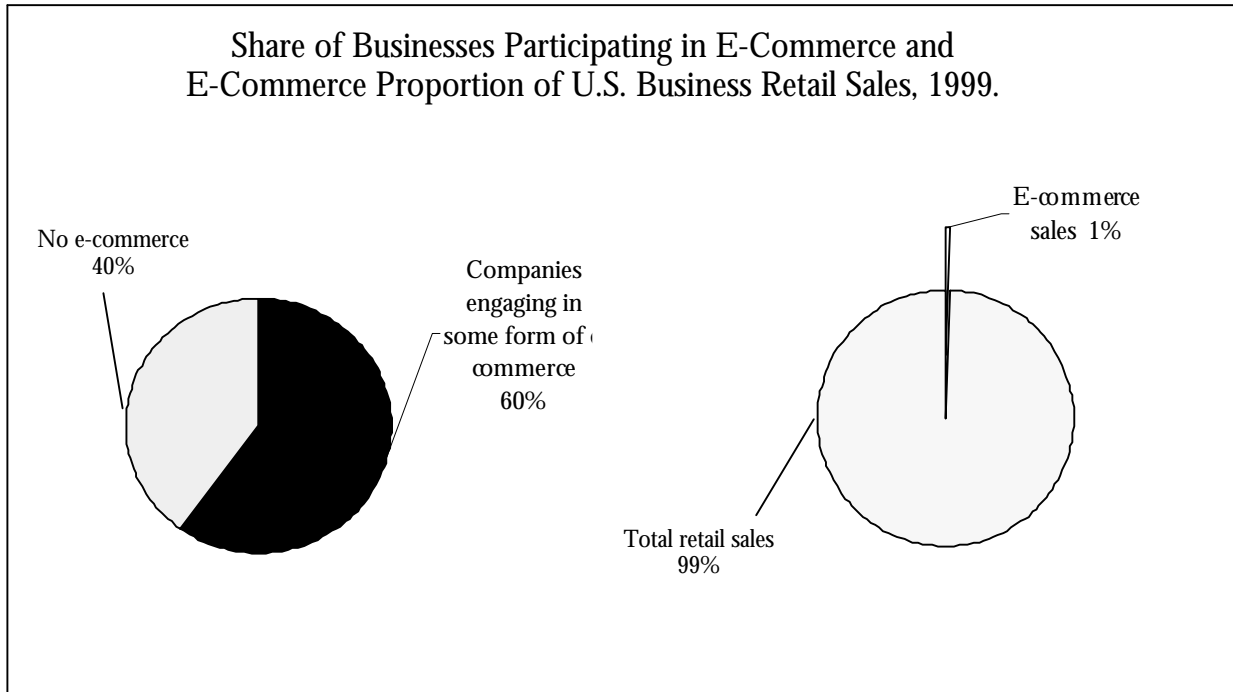
<sup>48</sup> "Small Business: Internet Infrastructure and Commerce."

<sup>49</sup> Richard Villars, "B2B: An Emerging E-Frontier for Small Businesses," May 2000. <http://www.idc.com>

<sup>50</sup> *Ibid.*



**Figure 2**



Source: Prepared by the Office of Advocacy, based on data from National Association for Business Economics, April 2000; U.S. Department of Commerce, March 2000.

expected to be \$2.0 trillion by 2003 and an additional \$780 billion in purchases will be made over private networks using EDI.<sup>51</sup> B2B e-commerce will account for almost 24 percent of total business-to-business commerce by 2003.<sup>52</sup>

By 2003, more than 65 percent of all business-to-business e-commerce purchases will be made by six sectors: retail trade, motor vehicles, shipping, industrial manufactured equipment, high-tech equipment, and the government, according to the Boston Consulting Group (BCG).<sup>53</sup> U.S B2B e-commerce was estimated at \$671 billion in 1998, of which \$92 billion was derived from Internet-based transactions, and the remainder was from transactions using electronic data interchange (EDI).<sup>54</sup>

<sup>51</sup> Boston Consulting Group, "New BCG Study Re-evaluates Size, Growth and Importance of Business-to-Business E-Commerce." See [http://www.bcg.com/new\\_ideas/new\\_ideas\\_subpage5.asp](http://www.bcg.com/new_ideas/new_ideas_subpage5.asp)

<sup>52</sup> *Ibid.*

<sup>53</sup> *Ibid.*

<sup>54</sup> *Ibid.*

Businesses that moved assertively into business-to-business e-commerce reported cost savings on materials of up to 15 percent, BCG noted.

Business-to-consumer (B2C) e-commerce growth has been rather gradual by comparison to B2B growth. In 1999, small business-to-consumer e-commerce generated \$33.1 billion, about 1.4 percent of all retail sales, according to BCG.<sup>55</sup> Nevertheless, the B2C market is also growing fast: it is expected to increase by 85 percent, and exceed \$61 billion in revenues in 2000.<sup>56</sup>

This new method of doing business continues to evolve as new technologies emerge. E-marketplaces, also known as auction or exchange sites, are an emerging form of e-commerce. An e-marketplace is a third party that establishes itself as a community builder, allowing buyers, suppliers, and third parties such as distributors to exchange information and conduct business through a shared catalog.<sup>57</sup> In 2000, auction sites are expected to conduct about 7.5 percent of B2B e-commerce; by 2004 they will generate more than \$1.2 trillion in sales by 2004.<sup>58</sup>

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<sup>55</sup> Boston Consulting Group, "Online Retailing in North America Reached \$33.1 Billion in 1999 and is Projected to Top \$61 Billion in 2000," *The State of Online Retailing*, April 2000. See [http://www.bcg.com/new\\_ideas/new\\_subpage1.asp](http://www.bcg.com/new_ideas/new_subpage1.asp)

<sup>56</sup> *Ibid.*

<sup>57</sup> "B2B: An Emerging E-Frontier for Small Businesses."

<sup>58</sup> *Ibid.*

## The Global Small Business Infrastructure

Worldwide, small businesses are investing in information technology products, accessing the Internet, and conducting electronic commerce online. Small businesses in Germany, France, and the U.K. spent approximately \$106 billion on IT and telecommunications a year ago, while other small businesses worldwide spent about \$450 billion on IT and telecommunications.<sup>59</sup> Access Media International (AMI) divides deployment of the infrastructure of Internet technology by small businesses into three phases:<sup>60</sup>

- 1) Building the basic infrastructure – acquiring PCs, peripherals and applications;
- 2) Communications and networking – adopting connectivity solutions, local area networks (LANs), servers, software, basic Internet access, and high-speed data lines; and
- 3) Leveraging the World Wide Web and network extension – implementing Web sites, e-commerce, Web-related services, wide area networks (WANs), and broadband width.

It is estimated that the U.S. Internet service provider market generated about \$15 billion in income in 1998, compared with \$4 billion in the entire European ISP market.<sup>61</sup>

North America leads the rest of the world in information technology and will probably continue to do so. B2B e-commerce is expected to reach almost \$3.0 trillion in the United States, while in the rest of the world it will reach \$1.8 trillion by 2003.<sup>62</sup>

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<sup>59</sup> Andy Bose, Deepinder Sahni, and Ryan Brock, “The State of the Small Business Market – The Next Frontier of Growth For Global IT Industry,” Access Media International (USA), Inc. See <http://www.ami-usa.com/newwp2.html>

<sup>60</sup> *Ibid.*

<sup>61</sup> Jason Oxman, “The FCC and the Unregulation of the Internet,” OPP Working Paper No. 31, July 1999, 18.

<sup>62</sup> “New BCG Study Re-evaluates Size, Growth and Importance of Business-to-Business E-Commerce.”

## **Small Business Challenges and Policy Issues**

Small businesses will face a number of practical challenges as they enter the world of e-commerce. For example, those that focus primarily on providing Internet access and ISP services for a fee are likely to face challenges, as ISP and Internet access become available gratis. Most small firms, aware of this trend, have started making gradual changes in their business structures to adjust to the market. Growth in technology spending by small businesses may slow for a number of reasons, including lack of access to capital, rapid changes in technology, a lack of trained workers and increased employee training costs, and various taxation and regulation initiatives.

Small firms involved in the use, design and production of Internet-related goods and services are becoming important stakeholders in issues that will determine how the Internet develops and how these developments will affect business growth, both domestically and internationally. Significant debate has already begun on issues such as the following:

- taxation of goods and services sold over the Internet
- privacy of consumers, children and business
- Internet fraud and identity theft
- patent reform
- copyright protection
- trademark protection
- introduction of new top-level domain names such as .biz, .auto
- abusive domain name registration
- international management of the Internet
- informal resolution of disputes
- digital signatures and electronic contracting
- decency and obscenity
- encryption controls
- exportation of e-commerce goods
- anti-trust and restrictions on media outlets
- unsolicited e-mail
- network integrity and security
- Internet gambling
- uniformity of law – federal, state and international
- Internet security regulation
- digital divides initiative

Small businesses interested in these issues should be aware that many of them are already under consideration in the Congress, regulatory agencies, and state legislatures, and that other issues will emerge as technology expands. Small firms need to become involved in both the legislative and regulatory processes to ensure that Internet-based markets and technology remain open and accessible to them and that their rights are protected. The Internet is a new worldwide frontier and presents new challenges in need of imaginative solutions.

## **Conclusion**

The various data throughout this report indicate that small businesses are embracing electronic commerce and spending increasing amounts on information technology. Small businesses are serving as providers to other small businesses and are a contributing force in the booming e-economy. On average, small firms may not be technologically sophisticated, but some are among the most sophisticated developers of new technology. And while some small firms are less technologically advanced, they are often, because of their size, in a better position to act quickly to adopt—and make innovative adaptations to—new technologies in the market.

E-commerce takes a number of forms—business-to-business, business-to-consumer, e-procurement and e-marketplaces or auction sites. Small businesses participate in e-commerce as a supplier of IT products and services, and also as a buyer of IT products and services mainly to minimize costs and increase sales. E-commerce growth is concentrated in the business-to-business sector. However, business-to-consumer e-commerce is growing gradually and is dominated by larger companies. As this phenomenon continues, small businesses may continue to find more uses for business-to-business e-commerce.

The growth of Internet technology among small businesses is expected to expand rapidly as owners become aware, educated, and knowledgeable of the potential for process efficiencies and cost savings. Global expansion of the Internet also continues and will mean new competitive challenges for the U.S. small business sector. Proposals to regulate and tax Internet sales will likewise continue to increase, and small businesses will serve themselves well by staying informed and involved as e-commerce develops.