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Innovation Analysis Bulletin

A tri-annual report from Statistics Canada with updates on:

- **Government science and technology activities**
- **Industrial research and development**
- **Intellectual property commercialization**
- **Advanced technology and innovation**
- **Biotechnology**
- **Connectedness**
- **Telecommunications and broadcasting**
- **Electronic commerce**

Innovation Analysis Bulletin
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Keep an eye out in the coming months for these surveys and publications.

Soon to be in the field

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Federal science expenditures and personnel, intellectual property management (fall 2001)

Annual survey of telecommunications service providers (May and June 2001)

Forthcoming releases

Choices and performance: determinants of S&T skills (in Statistics Canada's *Education quarterly review* – fall 2001)

Globalization of technology and innovation: evidence and implications (August 2001)

Research papers based on the 1999 *Household Internet use survey* (summer 2001).

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Get connected with us

Besides the articles to which we refer in this bulletin, Statistics Canada's Web site provides a wealth of statistics, facts and research papers on a variety of related topics. As well, most of the questionnaires we have used to collect the information are available for research purposes.

As of May 2001, there were:

- 15 fee publications
- 4 free publications
- 13 research papers,
- 43 working papers, and
- 26 questionnaires.

Revenues and research and development in Canadian biotechnology firms

Canada had 358 biotechnology firms in 1999 that generated revenues of more than $1.9 billion from activities directly related to biotechnology, according to data from the *Biotechnology use and development survey -1999*. The survey, administered by the Science, Innovation and Electronic Information Division of Statistics Canada, provides information on firms involved in developing new products and processes using biotechnologies. It was conducted as part of a project to develop biotechnology statistics under the Canadian Biotechnology Strategy, and addressed the basic question: What are the characteristics and activities of firms that use or develop biotechnology as an important part of their firm's activities[1]?

Overview

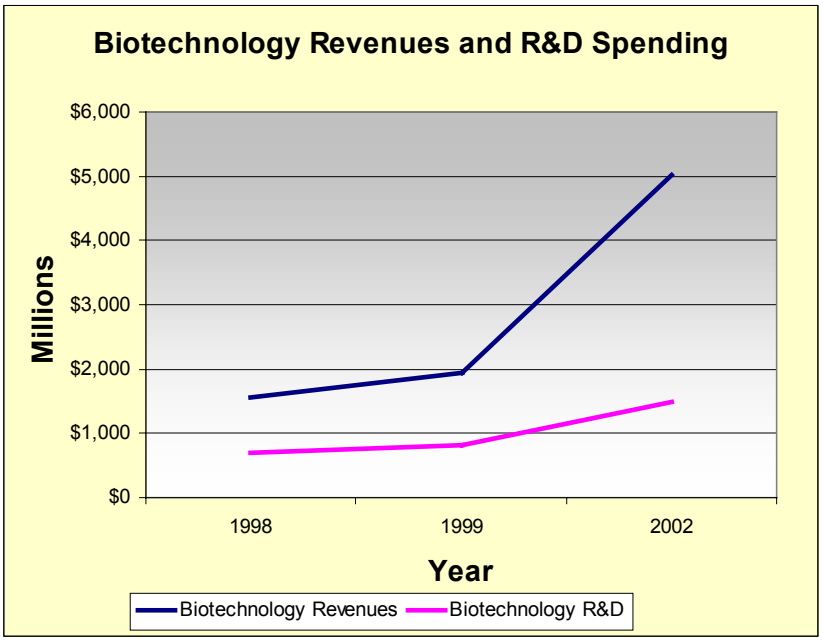
Canadian biotechnology firms demonstrated growth in activities including revenues, research and development, and imports and exports. The $1.9 billion in revenues from biotechnology in 1999 (a 25% increase over 1998 revenues) are expected more than double to $5 billion by 2002. The 1999 biotechnology revenues made up just 11% of the more than $18 billion in total revenues for these firms.

Biotechnology firms invested more than $800 million in biotechnology-related research and development in 1999, and forecast research and development expenditures to reach almost $1.5 billion by 2002.

These firms are active in exporting biotechnology with the value of these exports exceeding $700 million in 1999 and expected to grow to almost $1.7 billion by 2002. Among core firms, biotechnology exports exceed biotechnology imports by a greater margin each reporting year.

Firms were actively involved in the development of new biotechnology products or processes. About one-half of the over 17,000 products or processes currently in development is in the research and development stage. Products range from environmental products or processes to human health to the human genome, and are being developed by large and small firms across Canada.

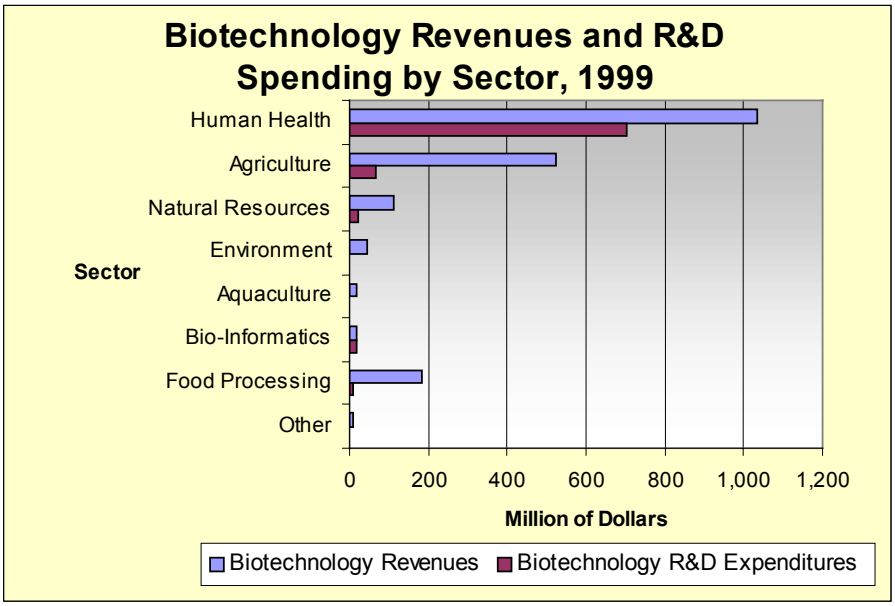
Each biotechnology sector has its unique characteristics, which are reflected in the revenues and expenditure patterns of the sector. For example, the human health sector dominates biotechnology with 41% of the firms. These firms account for 55% of biotechnology revenues, 86% of biotechnology R&D, and 74% of total R&D performed by biotechnology firms in aggregate. In contrast, the natural resources sector dominates total revenue with 38%, but accounts for less than 5% of both biotechnology revenues and research and development investment.



Comparison of the biotechnology revenue with biotechnology R&D by sector highlights interesting differences. For example, in 1999 in the human health sector R&D amounted to 65% of revenues compared to 13% for agriculture. This suggests two observations. First products developed in the agriculture sector may have reached a more advanced stage of commercialization compared to human health. This leads to the second observation. In human health the current level of research and development effort may hint of important revenues yet to come.

[1] Biotechnology firms are defined as those firms conducting active research and development in biotechnology and consider biotechnology central to their activities. These firms are referred to as biotechnology firms or core firms throughout the paper.

The increase in revenues anticipated for 2002 perhaps is the result of optimism in the sector as firms begin to see the results of research and development programs on the revenue side of financial statements. In 1999, only about 65% of all firms conducting biotechnology research had revenues from biotechnology sources. In other words, almost 35% of biotechnology firms are conducting research in biotechnology areas that are not yet generating revenues from this biotechnology activity. Of note, in 1999, 15% of biotechnology firms had no revenues to offset biotechnology R&D expenditures.



Human health leads biotechnology

Human health dominates both the revenue and R&D spending in the biotechnology sector. Its over $1 billion in biotechnology revenues account for more than 50% of all biotechnology revenues. Human health R&D spending accounts for 85% of all biotechnology related R&D spending. Firms forecast that this dominance in both spending and revenue is expected to continue into 2002.

Geographic comparisons

Despite a similar number of firms in Ontario and Quebec in 1999, differences can be found in biotechnology research and development expenditures, and these differences are expected to continue into 2002. Quebec firms spent $337 million on biotechnology research and development, about 40% of the total expenditures on biotechnology R&D. Ontario companies spent $223 million, about 27% of the total, and British Columbia firms $131 million, or about 16%. Firms in Quebec and British Columbia anticipate almost doubling their spending on biotechnology research and development in 2002. Spending in Ontario is expected to increase over 60%, or $155 million. In all provinces for which data are available, biotechnology R&D expenditures are expected to increase.

Firm size comparisons

Small firms dominate the biotechnology landscape with 75% of the firms, followed by medium and large firms with 14% and 11% respectively. However, large firms generated over 70% of total biotechnology revenues in 1999. Large firms also contribute $465 million (57%) of biotechnology research and development. Among large firms biotechnology R&D spending is about one-half of biotechnology revenues. By comparison small firms biotechnology R&D expenditures exceeded biotechnology revenues in 1999. This underscores the intensive research nature of small firms. Although revenues are expected to exceed R&D expenditures in 2002, small firms still expect to spend over $500 million on biotechnology R&D, representing 75% of the over $750 million in anticipated biotechnology revenues.

Summary

Despite experiencing and anticipating large growth in revenues, firms are not resting on past R&D programs. There appears to be a long-term commitment to research and development. Evidence for this is found in R&D expenditures with anticipated growth to over $2 billion by 2002, a doubling between 1998 and 2002. Biotechnology research and development expenditures were $827 million in 1999 and are expected to reach $1.4 billion in 2002. As a percentage of biotechnology revenue, biotechnology R&D is expected to drop from almost 45% in 1998 to an estimated 30% in 2002, despite an anticipated doubling in dollar value of R&D spending. This reflects the large (157%) anticipated growth over 1999 biotechnology revenue in 2002, to over $5 billion.

References

This article is derived from the working paper *Biotechnology use & development survey – 1999* released in the March 30, 2001 issue of the Statistics Canada Daily.

Further information: Chuck McNiven, SIEID, Statistics Canada, (613) 951-1233, Chuck.McNiven@statcan.ca

Some preliminary findings from the *Survey of innovation 1999* for manufacturing industries

According to findings from the *Survey of innovation 1999*, 80% of manufacturing firms are innovators. Improving product quality was indicated as the most important objective of innovation. The most frequently indicated obstacle to innovation was the inability to devote staff to projects on an on-going basis because of production requirements. The most important impact of innovation was that it allowed the firm to keep up with competitors.

How do we define innovation?

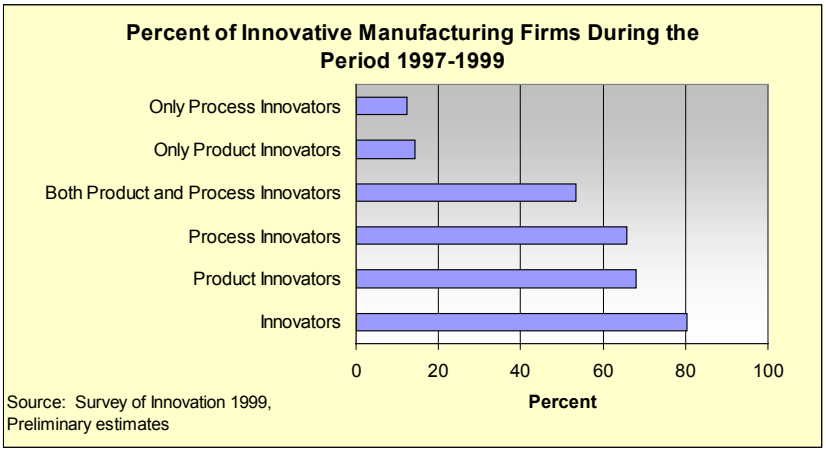
The Oslo Manual (OECD/Eurostat, 1997) is a source of proposed guidelines for collecting and interpreting innovation data. This manual identifies two types of innovation that have been adopted by many OECD countries in their investigation of innovation in the manufacturing sector–**product innovation** and **process innovation**. Concerning **product innovation**, the product must have been introduced to the market. A **process innovation** must have been used within the production process. An innovative firm is one that has implemented a new or significantly improved product or process during the period under review. Eurostat's *Community innovation surveys* (Eurostat 1993, 1997) have adopted a 3-year period of reference to explore the nature of innovation and innovative activity. This 3-year approach was followed for Statistics Canada's *Survey of innovation 1999* with the frame of reference as 1997-1999.

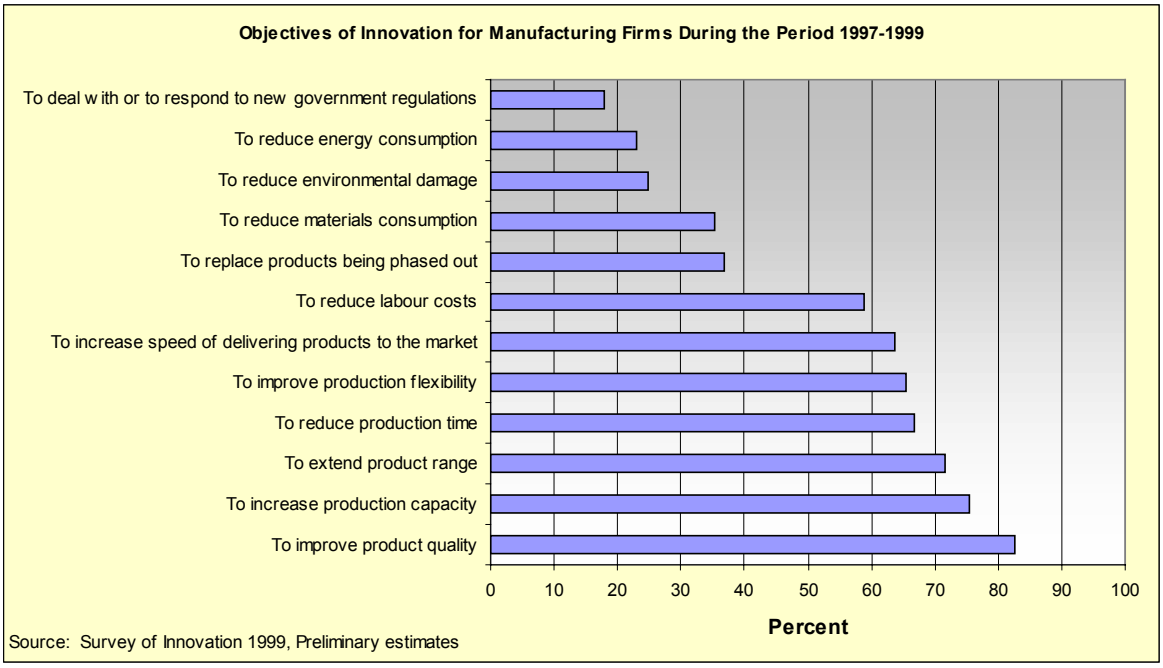
Percentage of innovative firms

Results from the *Survey of innovation 1999* showed that 80% of Canadian manufacturing firms were innovative, i.e. the firm offered a new or significantly improved product to its clients and/or introduced a new or significantly improved production/ manufacturing process. Sixty-eight percent of Canadian manufacturing firms introduced product innovations and 66% introduced process innovations. Fifty four percent of Canadian manufacturing firms were both product and process innovators, 14% were only product innovators, and 12% were only process innovators.

Why do firms innovate?

The three objectives of innovation most commonly indicated as being important were to improve product quality (83%), to increase production capacity (75%), and to extend product range (72%).

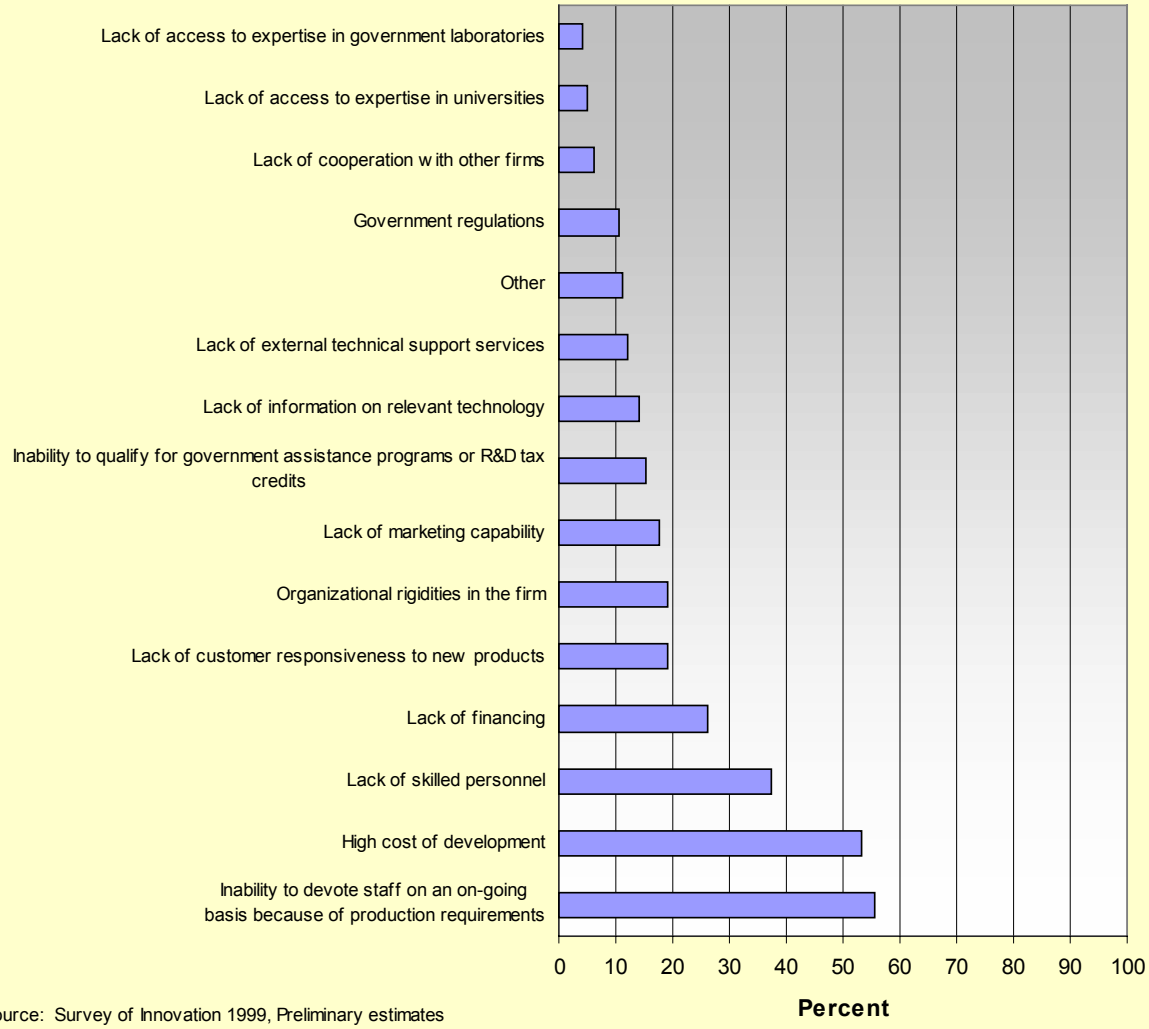




Problems and obstacles faced by innovative manufacturing firms

Innovative manufacturing firms were asked to indicate which of the listed problems or obstacles slowed down or caused problems for them when they developed new or significantly improved products or introduced new or significantly improved processes. The obstacle most frequently indicated by these innovative firms was the inability to devote staff to projects on an on-going basis because of production requirements (56%). The high cost of development (53%), lack of skilled personnel (37%), and lack of financing (26%) were the next most common obstacles.

Problems and Obstacles that Manufacturing Firms Faced When they Developed Innovations During the Period 1997-1999

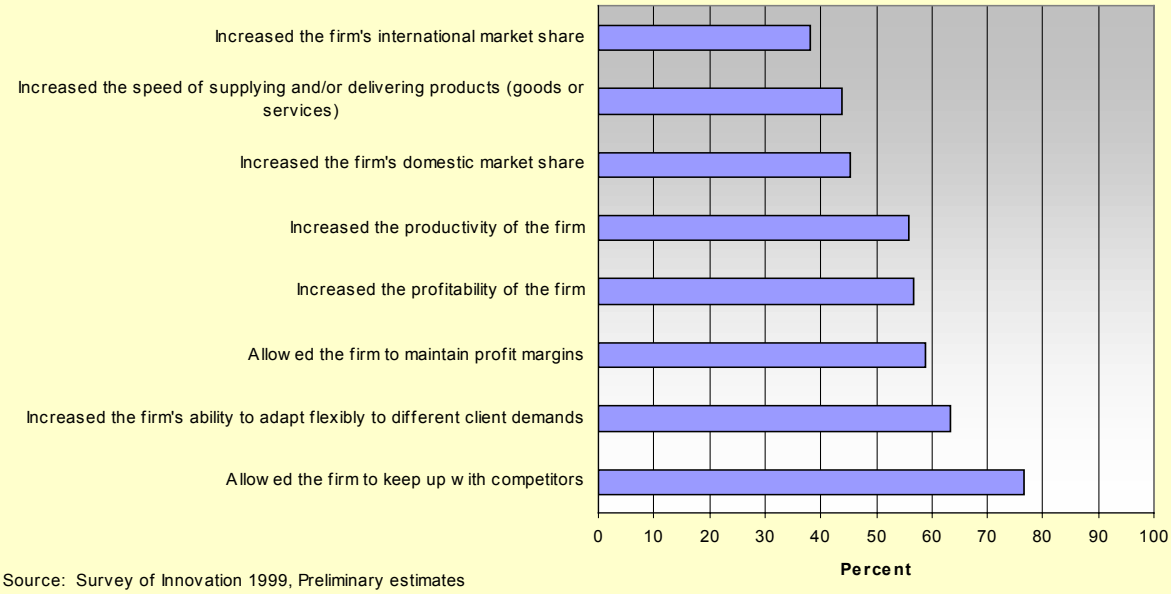


Source: Survey of Innovation 1999, Preliminary estimates

What was the impact of innovation on the firm?

Innovative manufacturing firms were asked to indicate their degree of agreement with a number of important impacts of the new and significantly improved products and processes. Seventy-seven percent agreed that their development and introduction allowed the firm to keep up with com-

Impact of Innovation on Manufactruing Firms During the Period 1997-1999



Source: Survey of Innovation 1999, Preliminary estimates

petitors. The next most agreed upon impact was that innovation increased the firm's ability to adapt flexibly to different client demands (63%). Fifty-nine percent of innovative firms agreed that innovation allowed the firm to maintain profit margins while 57% agreed that it increased the productivity of the firm.

References

Eurostat (1993), *Community innovation survey* (Questionnaire).

Eurostat (1997), *Community innovation survey II* (Questionnaire).

OECD/Eurostat (1997), *Proposed guidelines for collecting and interpreting technological innovation data* (Oslo Manual), Paris.

For further information: Susan Schaan, Analyst, SIEID, Statistics Canada, (613) 951-1953 Susan.Schaan@statcan.ca

Canadian telecom industries - year 2000, a period of change

Statistics Canada conducts both annual and quarterly surveys of the telecommunications sector. These comprehensive surveys provide telecom watchers with timely information on this growing sector. The summary of quarterly data for 2000 discusses highlights for industry indicators.

Operating revenues = growth

The Canadian telecommunications industry showed steady growth in gross operating revenues during the year 2000. Operating revenues totalled $31.1 billion for the year, up by 8.5% from 1999.

The recent pattern of local revenues exceeding long distance revenues continued. Local services were $7.1 billion for the year—29% of total wireline operating revenues and 4.7% above last year's figure. Long distance services were $5.5 billion, down 6% from last year.

Total wireless operating revenues were 20% over the 1999 total ($5.6 billion). As with wireline carriers, local services are the wireless industry's major source of revenues, but account for a greater share of total operating revenues ($957 million / 62.4%).

Operating profit = growth, but returns vary

Operating profit totalled $4.96 billion in 2000—16% of annual operating revenues and a 5% increase over 1999.

Returns varied, depending on the sector of the telecommunications industry. The operating profit for wireline carriers was about 20 cents on each revenue dollar. In 1999, the wireless industry had reported three quarters of losses but only a small annual loss. The 2000 annual loss amounted to one cent on the revenue dollar. Lower profit levels in the wireless industry reflect the on-going roll-out costs for new services, and for establishing each service provider's presence in a highly dynamic and competitive market.

Capital Expenditures - still strong in 2000

The telecommunications industry's on-going demand for high technology, capital-intensive applications is evident. Telecommunications industries invested over $6 billion in capital expenditures during 2000. This was only 4% lower than record capital spending reported in 1999.

Employment = growth

By end of year 2000, the telecommunications industry employed 92,858 persons; 80,228 in full-time positions and 12,630 in part-time positions. Employment had been gradually decreasing owing to downsizing and corporate consolidations over the past several years, but 2000 saw the number of employees increase by 3.4% over 1999. The growth can be attributed solely to wireline carriers - they reported 1602 new full-time positions; the rest of the industry reported 396 fewer full-time employees.

Average annual labour costs (wages, salaries and benefits) per employee (full-time equivalent) were down slightly from 1999 for the wireline industry ($65,657) and down $1,314 on average in the wireless industry ($61,772).

Wireline access = growth

Public-switched telephone network (PSTN) wireline access reached just over 20 million lines at the end of 2000, an increase of 4% from 1999. Residential lines accounted for 66% of the total and business lines represented 34% of PSTN lines.

Another milestone realized in 2000 is the growth in digital mobile services. For the first time, the number of digital subscribers surpassed analogue subscribers (53% of total subscriptions). Digital telephony is required for the introduction of new mobile services relating to the Internet and e-commerce. The mobile industry anticipates this will help move their industry to the next level of consumer acceptance.

*This article is a summary of information previously presented in **Quarterly telecommunications statistics**, Cat. No. 56-002-XIE, Vol. 24, No. 4 released in the Statistics Canada **Daily** on March 23, 2001.*

Further information: Haig McCarrell, Chief, Telecommunications, SIEID, Statistics Canada, (613) 951-5948, Haig.McCarrell@statcan.ca.

The facts on Internet shopping from home

"I'm going shopping" now also means logging onto the Internet rather than going to the mall or phoning in a catalogue order. Consumers can browse the Web for purchasing ideas, to place orders and even pay for purchases over the Internet. Canadians have started doing so. Statistics Canada has been monitoring household Internet use for some time. With e-commerce as an emerging phenomenon, the 1999 *Household Internet use survey* (HIUS) collected detailed information on Internet shopping for the first time.

Internet shopping

In 1999, 1.8 million households indicated that at least one member of their household had engaged in some aspect of Internet shopping from home, either using the Internet as part of their buying process by researching characteristics and prices of goods and services (window-shopping) or placing orders for purchases online.

These households represented 15.3% of all households and more than half (53.2%) of the 3.3 million Internet home-use households.

E-commerce

There were 806,000 households that took the extra step of actually engaging in e-commerce, accounting for almost a quarter of home-use households. These households placed 3.3 million orders[2] for goods and services online, regardless of whether or not these orders were paid for online or through alternative methods. The value of these orders amounted to $417 million (Canadian dollars) - which accounts for a very small fraction of annual consumer spending[3].

Destination of orders and payments

Of the total number of orders placed, 1.8 million or slightly over half (54.5%) were made to Canadian firms. However, the dollar value of orders to Canadian firms ($250 million) represented 60% of total household spending online, reflecting a higher average value of domestic orders.

Types of products and services

Overall, Internet shoppers were most attracted to sites offering reading materials, travel arrangements and computer software. E-commerce households were inclined towards products and services that had smaller price tags - books, magazines and newspapers ranked first, followed by computer software and music. However, window-shoppers checked out "big ticket" items, with travel arrangements topping the list and automotive products placing second.

Security and privacy

Concerns about Internet security and privacy may have played a role in both the frequency and the intensity of household e-commerce. Almost three-quarters of regular home-use households were unwilling to provide credit card information over the Internet.

Of those individuals willing to make credit card transactions, almost half (45.7%) of all home-use households were very concerned about the security of financial transactions, such as using credit cards for purchases. Window-shoppers and those households who paid on-line expressed similar concerns.

To put it in perspective, in 1999, 79% of all Internet shoppers expressed that they were either very concerned or concerned about Internet security. Almost three-quarters the group of e-commerce households (households that did place at least one order over the Internet regardless of whether or not they paid on-line) expressed similar concerns. Additionally, of households that paid on-line, 70% were concerned about financial security of the Internet with a full one-third being 'very concerned'.

Privacy issues were a concern for almost three-quarters of Internet shoppers and more than two-thirds of e-commerce households.

Household income and the Internet shopper

Internet shopper households were concentrated in the higher income levels, with 45% having household incomes in excess of $65,000 and more than 70% with incomes greater than $45,000. Only 14% of Internet shopper households had incomes less than $30,000.

[2] Orders refer to the number of distinct transactions and may be for one or more items.

[3] This refers to the value of orders placed by households from home to Internet retailing sites of businesses, regardless of whether or not these businesses belong to the retail industry. For instance, orders may well have been placed on the retailing sites of firms in the manufacturing or the transportation industries. In a recent release (Statistics Canada 2000b) it was reported that the Canadian retail industry generated $611 million in e-commerce revenues in 1999. This figure is not comparable to the $417 million reported here for several reasons. Canadian retailers were asked to report the value of their Internet-based orders, regardless of whether these orders originated from households ordering from home or other locations, other businesses or foreign countries. Regular home-use households were asked to report the value of their Internet-based orders, whether they were placed to Canadian or international sites. In addition, the reference period was the calendar year, whereas the household survey covered the 12-month period of November 1998 to November 1999.

Personal education and the Internet shopper

Half of Internet shopper households (49.6%) had at least one member with a university degree or certificate while only 1.9% had no high school graduates.

Summary

Household Internet shopping is an emerging consumer phenomenon.

Internet activity was enhanced by having established online, the presence of well-known booksellers, computer software and hardware dealers, and music and travel merchants. These types of products and services attracted the most attention of Internet shoppers (actual hits on their Internet site).

High-income households with university-educated members were more likely to engage in Internet shopping.

Types of e-commerce households

Internet shoppers: Households that in the 12-month period (November 1998 - November 1999) engaged either in window-shopping or e-commerce. Population – 1.8 million households.

Window-shoppers: Households that browsed for goods and services over the Internet but did not place orders over the Internet. Population – 971,000 households in 1999.

e-commerce: Households that did place at least one order over the Internet from home, regardless of whether or not they paid on-line. Population – 806,000 households in 1999.

To access more information on the *Household Internet use survey*, please visit our Web site by following these instructions:

http://www.statcan.ca

Click on *Our Products and Services*

Click on *Free Publications*

Click on + *Communications*

Internet Use in Canada will appear Click on *free*

Click on *Table of Contents*

In general, households expressed concern about the financial security of on-line transactions, as well as the protection of their privacy in electronic communications.

References

Ellison J., Earl L., Ogg S., (2001), *Internet shopping in Canada*, Connectedness Series, Statistics Canada, Cat. no. 56F0004, No.3.

If you are interested in more information on Internet shopping in Canada, please visit our site, view Research Papers, Communications and click on Connectedness Series.

Further information: Jonathan Ellison, Unit head, Household Internet Use Survey, SIEID, Statistics Canada, (613) 951-5882, jonathan.ellison@statcan.ca

Electronic commerce and technology 2000

Electronic commerce generated $7.2 billion, up a whopping 73% from 1999. Still, business transacted on-line remained a small portion of Canadian economic activity in 2000. Sales over the Internet accounted for a mere 0.4% of total business operating revenue. Although sales over the Internet rose sharply in 2000, the proportion of businesses selling on-line fell.

Defining the participants and electronic commerce

The *Survey of electronic commerce and technology, 2000* covers the entire economy, except for: construction, local government, production of crops and animals, and fishing, hunting and trapping. Electronic commerce is defined as sales over the Internet with or without on-line payment.

More sales despite fewer businesses selling on-line

The total value of electronic commerce sales rose by 73% in 2000 to $7.2 billion from $4.2 billion a year earlier. However, the proportion of businesses selling on-line fell to 6% in 2000 from 10% a year earlier. Among the businesses that responded to the survey in both 1999 and 2000, for every two businesses that started to sell over the Internet in 2000, five stopped selling on-line. The value of sales in 1999 for those firms that, in 2000, are no longer selling on-line was more than half the value of sales for these new on-line sellers.

Electronic commerce remained a small portion of Canadian economic activity in 2000. Sales over the Internet accounted for 0.4% of total operating revenue in 2000, an increase from 0.2% in 1999.

Who is selling how much?

Manufacturers sold $1.3 billion worth of goods and services over the Internet in 2000, an increase of over $400 million from 1999. This represented 0.2% of their total operating revenue, the same proportion as in 1999. Most sales in the manufacturing industry came from transportation equipment manufacturers. Nearly one-quarter of manufacturing sales were for export.

The wholesale trade industry sold $1.0 billion worth of goods and services over the Internet, representing 0.3% of operating revenue. Within this industry, machinery, equipment and supply wholesalers had the highest contribution to e-commerce sales.

Retailers in Canada attracted $890 million of e-commerce sales last year, 0.4% of their operating revenue. Sales by motor vehicle and parts dealers as well as sales by food retailers accounted for over two-thirds of on-line retail sales. Food retailers may include wholesale establishments that supply their franchises, other food stores or restaurants. Almost all Internet sales from food stores were to other businesses, with less than 1% of sales going to consumers. Almost half of electronic retail trade sales were to consumers.

The buyers include…

Just over 18% of firms, accounting for 37% of economic activity in the private sector, were buying on-line in 2000, up from 14% in 1999. Information and cultural industries (53%) and education services (41%) had the highest proportion of businesses purchasing over the Internet. Information and cultural services industries include enterprises engaged in publishing, broadcasting, telecommunications, information services and broadcasting.

Choosing not to buy or sell on-line

Among enterprises that did not buy or sell on-line in 2000, over half believed that their goods and services did not lend themselves to on-line sales. Over one-third stated that they preferred to maintain their current business model while 14% believed that security was an issue. A smaller proportion believed that their customers (10%) or suppliers (6%) were not ready to engage in e-commerce.

Businesses that sold goods or services over the Internet in 1999 but not in 2000 were less likely to say that their goods or services did not lend themselves to Internet transactions or that they preferred to maintain their current business model. These businesses were more likely to say that their customers or suppliers were not ready for e-commerce.

Use of the Internet by business continues to grow

While the value of sales over the Internet was small, businesses continued to embrace the Internet in 2000. More businesses had Internet connections in 2000 than in 1999 (63% compared with 53%). The proportion of employees with direct access to the Internet advanced to 39% in 2000 from 28% a year earlier. One quarter of enterprises had a Web site in 2000, up from 22% in 1999.

This article is a summary of the Statistics Canada ***Daily*** *release of April 3, 2001.*

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What's new?

Recent and upcoming events in innovation analysis.

Science and innovation

S&T activities

Federal and provincial S&T

Federal science expenditures

Status: *Federal scientific activities* Cat. No 88-204 was released in March 2001.

Contact: *Bert Plaus (613) 951-6347,*
Bert.Plaus@statcan.ca

or: *Janet Thompson (613) 951-2580*
Janet.Thompson@statcan.ca

Industrial R&D

Research and development in Canadian industry

Status: The annual report 88-202 *Industrial Research and Development* was released in January 2001.

Contact: *Bert Plaus (613) 951-6347*
Bert.Plaus@statcan.ca

Research and development in the health field

Status: A service bulletin, *Science statistics,* Cat. No. 88-001 volume 25, no. 2 covering estimates of total spending on R&D in the health field in Canada for the years 1988 to 2000 was released in March 2001.

Contact: *Janet Thompson (613) 951-2580*
Janet.Thompson@statcan.ca

Human resources and intellectual property

The higher education sector

Intellectual property commercialization in the higher education sector

Status: The next survey is planned for the fall of 2001. Results are expected by mid-2002.

Contact: *Cathy Read (613) 951-3838*
Cathy.Read@statcan.ca

Federal intellectual property management

Federal science expenditures and personnel 1999-2000, intellectual property management, fiscal year 1998/99

Status: The next survey is planned for the fall of 2001. Results are expected by mid-2002.

Contact: *Michael Bordt (613) 951-8585*
Michael.Bordt@statcan.ca

Human resources in science and technology

Status: The paper *Choices and performance: determinants of science and technology skills* will be published in an upcoming issue of Statistics Canada's Education Quarterly Review.

Contact: *Michael Bordt (613) 951-8585*
Michael.Bordt@statcan.ca

Advanced technologies

Innovation and advanced technologies and practices in the construction and related industries

Status: Two working papers, one with national estimates and the other with provincial estimates, and a research paper on this topic are now available on the SIEID Web site.

Contact: *Frances Anderson (613) 951-6307*
Frances.Anderson@statcan.ca

Advanced technologies in natural resource industries

Status: The survey is under development.

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Innovation

Innovation in manufacturing

Status: Tables, containing the data from the *1999 Survey of innovation*, at the national level, for manufacturing, have been completed and delivered to the client. A similar set of tables containing data for selected natural resource industries will be completed by the end of May 2001. Working papers prepared using these tables are planned for completion by the end of June 2001.

Linkage of the principal statistics from the *Annual survey of manufacturing* to the *Survey of innovation 1999* has been completed. This rich database is currently being analyzed by staff of SIEID. Six groups of researchers have had their research proposals accepted and are being given Facilitated Access to the database. In addition, requests for tabulation at the national level have been prepared. The database is also being analyzed in preparation for the production of tabulations sub-nationally.

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Innovation in services

Status: A paper, *Capacity to innovate, innovation and impact: the Canadian engineering services industry* was released in April 2001. A paper, *Globalization of technology and innovation: evidence and implications* is under preparation. The expected release date is August 2001.

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Biotechnology

Federal S&T expenditures

Status: A paper will be released in early fall.

Biotechnology use and development survey - 1999

A first working paper (ST-01-07) was released on March 30, 2001 and is available at the following URL: http://www.statcan.ca/english/research/88F0006XIB01007.pdf. A second working paper will be published in spring 2001.

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Connectedness

ICT (Information and communications technology) compendium

In April 2001, the ICT Compendium publication entitled *Beyond the information highway: networked Canada* was released. The compendium provides the first comprehensive statistical profile of Canada's evolving information and communications technology (ICT) sector. Produced under Statistics Canada's Connectedness program, it examines the growth and performance of the ICT sector on the basis of such variables as output, employment, exports, imports, revenues and research and development. In addition, it integrates demand-side statistics and analysis concerning the penetration and use of ICTs, notably the Internet, across all economic sectors, households, business and governments, including education.

The publication can be accessed at www.statcan.ca (Internet version $38, hard copy $50)

Connectedness series

The third paper of the Series entitled *Internet shopping in Canada* has also been released. It provides an account of the size and scope of household Internet shopping, including the value of Internet purchases from home. It also examines the destination of e-commerce orders and payments, whether Canadian or international, the methods of payment and the types of products browsed, ordered and paid for over the Internet.

http://www.statcan.ca/english/IPS/Data/56F0004MIE.htm

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Telecommunications

The quarterly and annual surveys now include a sharing agreement with the Canadian Radio-Television and Telecommunications Commission (CRTC). This agreement will reduce the need for respondents to file similar information with Statistics Canada, saving time and money for all involved.

Annual survey of telecommunications service providers

Status: The 1999 annual survey is currently being processed. The 2000 survey will be mailed to respondents in May and June of 2001. Previous annual information can be found in our publication, *Telecommunications in Canada*, Cat. No. 56-203, featuring an article on industry supplier (incumbents, entrants, cellcos, etc.) market shares and performance from our Web site, www.statcan.ca

Quarterly survey of telecommunications service providers

Status: Fourth quarter statistics for 2000 have been released.

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Broadcasting

Status: A service bulletin, *Broadcasting and telecommunications*, Cat. No. 56-001-XIB, volume 30, no. 4, covering summary information on telecommunications, radio broadcasting, television broadcasting and cable and other program distribution was released. The information includes basic financial and operational statistics for each of the industries.

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Household Internet use

Status: Research papers from the 1999 survey will be released shortly.

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Business e-commerce

Survey of electronic commerce and technology

The results of the 2000 *Survey of electronic commerce and technology* were released on April 3, 2001.

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