



Research and Statistics Division



# questions & answers

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## Electronic Commerce

by:

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### Q1. What is the Internet?

The Internet is a cyberspace created by a collection of interconnected computer networks that offers users a vast amount of information and a variety of applications.

Technically, the Internet is a global collection of networks that use a common set of protocols (rules) to connect and share information. It allows computers attached to networks to communicate effectively regardless of their make, operating system or location. Unlike traditional forms of communication, separate networks with separate technologies for voice, data and video transmission are no longer necessary. The Internet can carry these over one simple infrastructure such as telephone lines, cable lines or wireless devices. This global computer network has a wide range of services that users can access. Concretely, users send electronic mail (e-mail), files (FTP), information and opinions (news groups), and consult information databases (Gopher, WAIS, Web). In short, it is the largest computer network on the planet.

In reality, the Internet, this network of networks, consists of a massive collection of computers, programs and data that are stored and linked together over a telecommunications system; the first digital information infrastructure in the world. This revolutionary new form of knowledge has already affected the way people teach and learn, buy and sell, practise medicine, organize their work schedules, publish, read, and last but not least, are entertained. In

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addition, the Internet does not have a specific physical location. Nor does this environment have institutions, groups or directors to manage it. On the contrary, this space has been deliberately decentralized, voluntarily deregulated, thereby turning it into a structure with an infinitely flexible process that can adapt to many forms of information. Thus, audio, video and text can co-exist easily to meet the needs of users.

**Sources:**

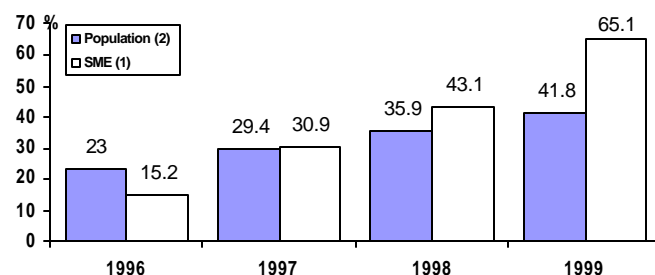
Industry Canada, *Using Electronic Commerce, Understanding Electronic Commerce: A Primer for Canadian Businesses Thinking of Going On-Line*, document available on the Internet at <http://e-com.ic.gc.ca/using/en/110.html>.  
 Ouellet, Caroline, *Qui fait la loi sur Internet ? Censure ou liberté, droits et responsabilité*, Les Presses de l'Université Laval, St Nicholas, Quebec, Canada, 1998, p.4.

**Q2. In Canada, how has Internet use grown in the last few years?**

In the last three years, Internet use among Canadians has almost doubled.

Between 1996 and 1999, the percentage of Canadians who browsed the Internet rose from 23% to 42%. Today, the percentage is almost six in ten Canadians.<sup>1</sup> Small- and medium-sized enterprises (SMEs) have also greatly increased their Internet use in the last three years. In fact, SMEs have quadrupled their national average, going from 15% in 1996 to 65% in 1999.

**Figure 1: Growth in Internet use by year**



**Source:**

(1) (SME = 0 to 500 employees) CFIB Internet Surveys, 1996-1999.  
 (2) Statistics Canada, Connectedness Series, November 2000.

As for businesses connected to the Internet, the progress is remarkable. Internet use among SMEs seems to be more popular among medium-sized businesses (100-499 employees) (91%) when compared with small businesses

<sup>1</sup> Trends and Issues, *INTERNET USE*, Environics, Focus Canada 2000-1, p. 110-111 states that 56% of Canadians are connected to the Internet, while The Angus Reid Report, *Canadian Internet Users' Behaviour*, Vol. 15, No. 2, March/April 2000, p. 35 states that two out of three Canadians (66%) have Web access.



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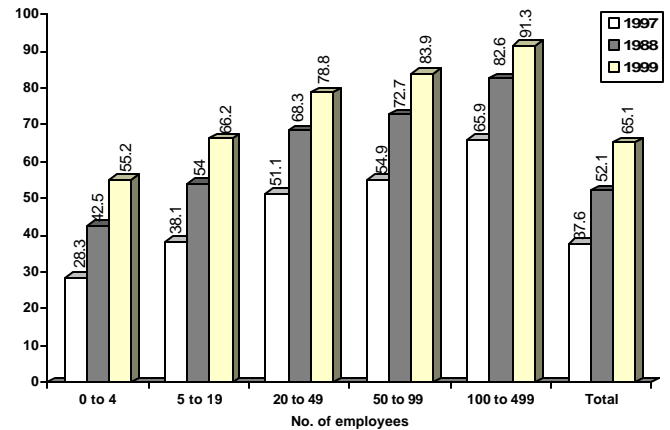
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(0 to 4 employees) (55%). However, Internet access among small businesses grew more rapidly (+49%) in the last two years when compared with use among large companies (+ 43%). (See Figure 2).

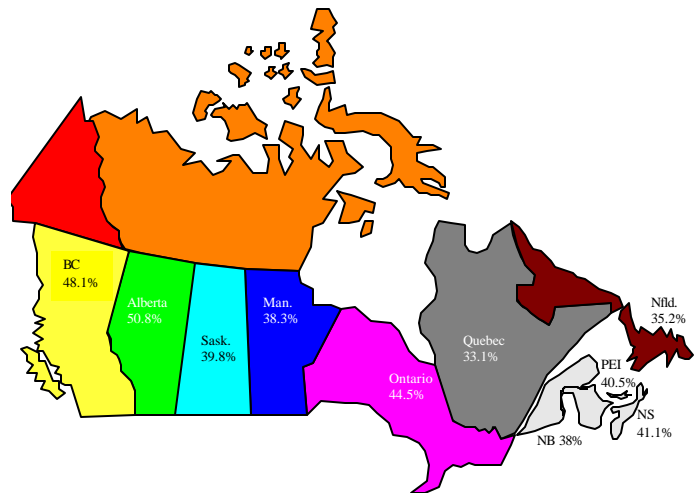
**Figure 2: Change in Internet use for SMEs according to number of employees**



Source: AC Nielsen, The Canadian Survey, 1996, 1997, 1998, 1999, 2000.

In Canada, a comparison between the provinces shows that Internet use is above the national average among the populations in the richest provinces (42%). People in the wealthiest provinces such as Alberta (51%), British Columbia (48%) and Ontario (45%) are more likely to have Internet access compared to less affluent provinces such as Quebec (33%), Newfoundland (35%) and Prince Edward Island (41%).<sup>2</sup>

**Figure 3: Graphic illustration of Internet use in Canada, by region, 1999**



Source: Statistics Canada, *Connectedness Series*, November 2000.  
 Note: Data for the Northwest Territories, Yukon and Nunavut are not available in graph format.

<sup>2</sup> Data for the Northwest Territories, Yukon and Nunavut are not available in graph format.

**Sources:**

AC Neilsen, *Internet Planner* cited in Canadian Internet Commerce Statistics Summary Sheet, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf>.  
 Canadian Federation of Independent Business, *Member's Opinions Survey #41 (July to Dec. 97), #43 (July to Dec. 98), and #45 (July to Dec. 99)* cited in *Review of Statistics Canada Survey*, document available on the Internet at <http://www.e-com.ic.gc.ca/english/documents/statsrev.pdf>.  
*CFIB Internet Surveys 1996, 1999* cited in *Canadian Internet Commerce Statistics Summary Sheet*, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf>.  
 Statistics Canada, Science, Innovation and Electronic Information Division, Connectedness Series, November 2000, document available at <http://www.statcan.ca>.  
 The Angus Reid Report, *Canadian Internet Users' Behaviour*, Vol. 15, No. 2, March/April 2000, p. 35.  
 Trends and Issues, INTERNET USE, *Enviro-nics*, Focus Canada 2000-1, p. 110-111.

### Q3. Who uses the Internet and how is it used?

There is no stereotypical user, but youth, males, well-educated people and those with the highest incomes use the Internet the most. In addition, the most popular activity by far among Internet users is sending and receiving e-mail.

#### Canadian population

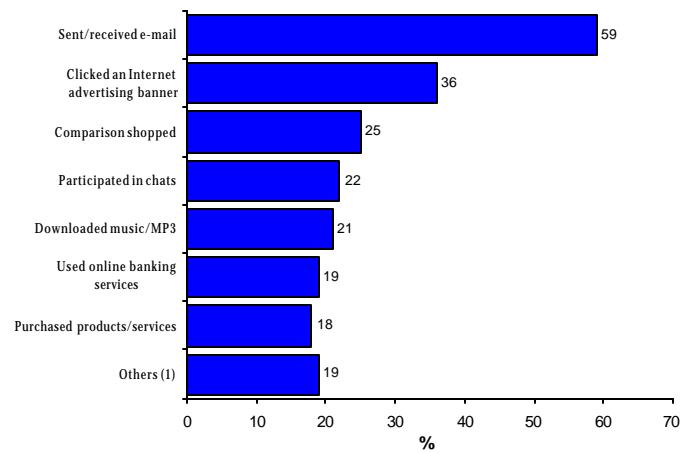
Today, eight in ten (83%) young adults (between 18 and 34 years of age) are now "hooked up" to the Internet. Conversely, among those 55 years and over, this rate drops by half with only four in ten people (38%) being connected. In addition, males (70%) are somewhat more likely to have access to the Internet than females (63%). Despite the fact that Internet service providers offer more and more free services, total family income also seems to have a strong influence on Internet users. Almost nine in ten families (85%) with a total family income of \$60,000 or more are connected, compared with five in ten families (50%) with a total family income of \$40,000 or less. The level of education also appears to play an important role in Internet access. The majority of university graduates (79%) are likely to have access as compared with those who do not have a high school diploma (22%). Furthermore, occupation seems to have an influence on Internet access because nine in ten students (91%) are connected compared with 41% of employees or professionals.<sup>3</sup>

The most popular activity by far among Internet users is sending and receiving e-mail. In fact, six in ten users (59%) use the Internet for e-mail services.<sup>4</sup> Also,

downloading music (mp3) is becoming increasingly popular (21%).<sup>5</sup>

The figures show that 36% of Canadians responded they had shopped to compare the prices of products and services available on the Internet with the so-called "normal" economic market, while only 18% said they had purchased products or services online at least once.

**Figure 4: Percentage of Canadians who took part in online activities, 2000**



**Note:** (1) Includes the categories of visiting pornography sites, buying/selling shares/investments, making Internet telephone calls and gambling.

**Source:** The Angus Reid Report, *Canadian Internet Users' Behaviour*, March/April 2000.

The frequency with which people use the Internet when compared by province shows that Alberta leads in the daily use of this service. In fact, Alberta is ahead of all the provinces, with six in ten people (61%) using the Internet daily, while Quebec is close behind with 58% of daily users. Ontario comes in third with 56%. These three provinces are above the national average for daily users (55%). British Columbia is ahead of the rest of the provinces when it comes to people who have never used the Internet. Thus 9% of the people living in British Columbia and 8% of Atlantic Canada residents responded that they never used the Internet, compared to Saskatchewan and Ontario where just 3% and 4% (respectively) indicated they had never used the Internet. This reveals a relatively significant difference between these two western provinces with respect to use of the Internet and its services.

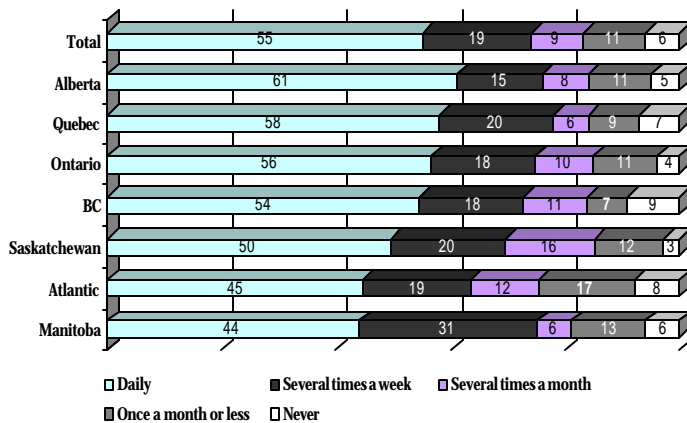
<sup>3</sup> See **Table 2** in the appendices for more information.

<sup>4</sup> This study was conducted in mid-March 2000 and the Angus Reid Group interviewed 1,501 Canadians. Consequently, online gambling, which had no respondents in this case, may not reflect the actual extent of this activity among Canadians.

<sup>5</sup> The word "MP3" recently replaced the word "SEX" as one of the words most used on search sites.



Figure 5: Frequency of Internet or e-mail use, 2000



Source: Trends and Issues, INTERNET USE, Environics, Focus Canada.

A closer look at daily Internet use shows that Montreal (68%) is in first place with respect to daily Internet use, compared to Toronto (56%) or Vancouver (61%). Naturally, university graduates and the professionals/administration/owners of large companies (each at 66%), those who have a higher income (62%), and people living in more densely populated areas (more than one million inhabitants) (61%) are more likely to use the Internet on a daily basis. Conversely, rural regions (less than 5,000 inhabitants) (48%), people aged 60 or over (39%), skilled and semi-skilled workers (37%), and people with less formal education (no high school diploma) are under the national average of 55%. (See Table 3.)

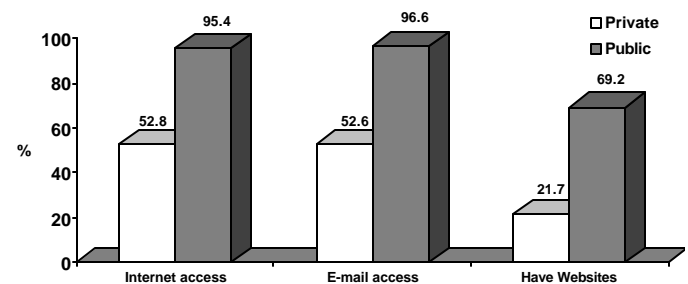
### Canadian businesses

The degree of connectivity is high among Canadian businesses in the private sector, but the public sector is a model Internet user. One in two Canadian businesses (53%) has access to the Internet compared with practically the entire public sector (95%). One in two businesses (53%) has access to e-mail, while 97% of the public sector has access.

### Sources:

Edward, G. and Mazzuca, J, *Majority of Canadians Have Internet Access*, The Gallup Poll, Vol. 60, No. 46, Toronto, Canada, June 21, 2000, p. 1.  
Industry Canada, *Review of Statistics Canada Survey*, document available on the Internet at <http://e-com.ic.gc.ca/english/documents/statsrev.pdf>.  
Industry Canada, *Canadian Internet Commerce Statistics Summary Sheet*, November 2000, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf>.  
Statistics Canada, *Connectedness Series*, November 2000, document available on the Internet at <http://www.statcan.ca>  
Trends and Issues, *INTERNET USE*, Environics, Focus Canada, 2000-1, p. 110-111.  
The Angus Reid Report, *Canadian Internet Users' Behaviour*, Vol.15, No.2, March/April 2000, p. 36.  
The Angus Reid Report, *Canadians' Internet and E-commerce Activities*, July/August 1999, p. 25-27.

Figure 6: Connectivity among Canadian businesses, 1999



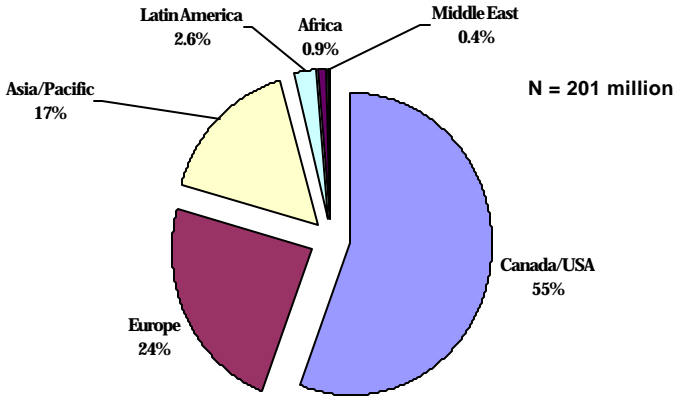
Source: (1) *Review of Statistics Canada Survey, 1999.*

## Q4. Compared with the world, where does Canada stand?

It is interesting to note that Canada is one of the most connected countries in the world. In addition, Canada can boast that it is the country with the lowest Internet access charges in the world.

The speed at which Internet access is becoming available is growing exponentially. The Internet as it is known today was created barely a decade ago. In 1989 there were only 100,000 computers connected to the Web. Today, it is estimated that there are 300 million around the world. Globally, Canada and the United States account for more than half of cyberspace users (56%). In fact, they outstrip Europe considerably (24%) as well as Asia and the Pacific (17%).

**Figure 7: World distribution of Internet users, September 1999**



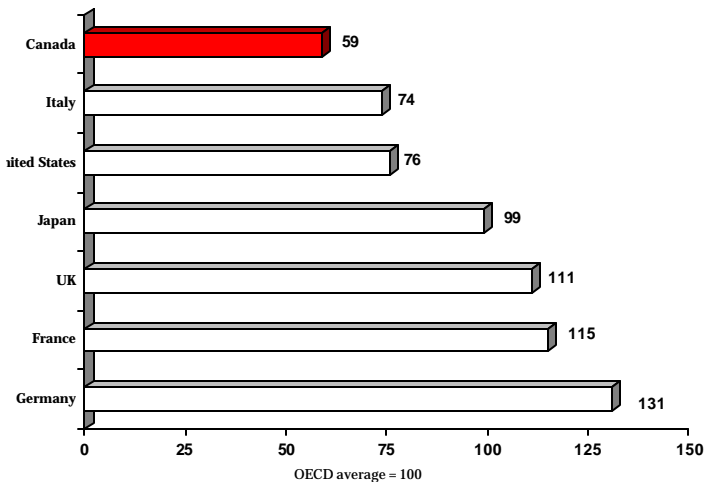
\*User means adults and children who have had access to the Internet at least once in the previous three months.  
 Source: Nua Internet Surveys "http://www.nua.ie".

**Proportion of users within countries**

According to the Angus Reid survey *Going Global on the World Wide Web*, the United States is the leader in the global wave to get connected to the Internet. They lead the pack with 59% of their population hooked up, but Canada follows very closely behind with 56%. The next spots go to Sweden (53%), Australia (48%), Switzerland (45%) and Finland (44%).

On another front, the Organisation for Economic Co-operation and Development (OECD) puts Canada first among the G7 countries for having the lowest Internet access charges. Germany has the highest charges compared to Canada, which is quite far below the OECD's average. Italy, the United States and Japan are also below the OECD average.

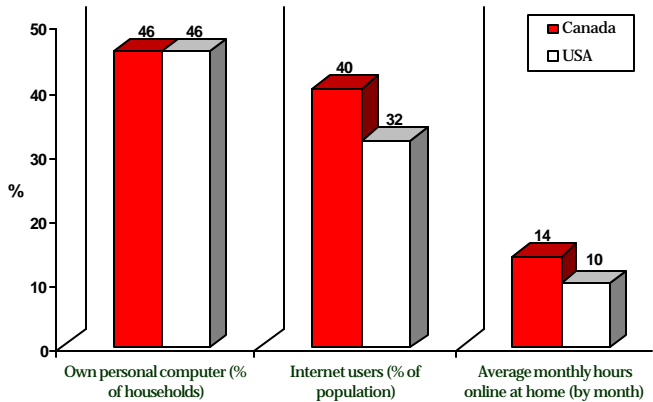
**Figure 8: Telephone and Internet access charges, 1998**



Source: OECD Communications Outlook, 1999, USD, PPP indexed to OECD average cited in The Boston Consulting Group (Canada), *FAST FORWARD: Accelerating Canada's Leadership in the Internet Economy*, January 2000. Based on blend of 20 peak and 20 off-peak hours online.

It is also interesting to see that Canada is first and ahead of the United States in adopting and using the Internet with respect to the proportion of people with a computer at home, the proportion of people who use the Internet at home, and the average number of hours spent on the Internet.

**Figure 9: Comparison between the United States and Canada**



**Sources:**

IDC data in IBM and Retail Council of Canada report, "E-Retail, The Race is On", 1999.  
 The Boston Consulting Group analysis based on IDC, "Internet Commerce In Canada, 1998-2003", Statistics Canada, US Census Bureau.  
 The Boston Consulting Group analysis based on IDC, "The Internet & its Impact on Electronic Commerce - Consumer Preferences: 1st Quarter Report" and "Web Usage Trends, 1998".

**Sources:**

Musgreave, J., *The E-Business Revolution: Are You Ready?*, January 31, 2000, original version first published in the London Free Press, document available on the Internet at <http://www.pwcglobal.com>.  
 Nua Internet Surveys "http://www.nua.ie" cited in *OECD Internet usage statistics*, available on the Internet at <http://www.oecd.org/dsti/sti/it/>.  
 The Angus Reid Report, *Going Global on the World Wide Web*, Vol. 15, No. 4, July/August 2000.  
 The Boston Consulting Group, *Report of the Canadian E-Business Opportunities Roundtable*, *FAST FORWARD: Accelerating Canada's Leadership in the Internet Economy*, January 2000, document available on the Internet at <http://e-com.ic.gc.ca/english/documents/roundtable.pdf>, p. 15.



## Q5. What is electronic commerce?

Electronic commerce refers to transactions carried over computer-mediated channels that comprise the transfer of ownership or the entitlement to use tangible or intangible assets.

Technically, electronic commerce is a commercial activity conducted over open networks (the Internet) or closed (private) networks linking mainly computers. Things like selling products, invoicing, controlling inventories, and communicating with suppliers and customers are prime examples of electronic commerce.

According to the Organisation for Economic Co-operation and Development (OECD), electronic commerce refers to the conduct of business activities by means of advanced communications and computer technologies. Thus, the sale of products and services electronically, the management of an investment portfolio by computer networking, or a transaction between major banks which would involve the exchange of vast amounts of financial assets are some examples.

### Sources:

Industry Canada, *Using Electronic Commerce, Understanding Electronic Commerce: A primer for Canadian Businesses Thinking of Going On-Line*, document available at <http://e-com.ic.gc.ca/using/en/110.html>.

Organisation for Economic Co-operation and Development (OECD), *Backgrounder: OECD/Canada Conference on Electronic Commerce, October 7-9, 1998*, document available at <http://e-com.ic.gc.ca/english/releases/413.html>.

Statistics Canada - Electronic Commerce Definition Project, *A REALITY CHECK TO DEFINING ECOMMERCE*, 1999, p. 8/40, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/300.html>.

## Q6. According to the latest statistics, in Canada, what are the results of economic activities generated by electronic commerce?

According to the estimates of International Data Corporation (IDC) Canada, in 1999, 87% (or CAN\$9.57 billion) of electronic commerce activities consisted of business-to-business transactions, while 13% (or CAN\$1.45 billion) involved business-to-consumer transactions, for a total of CAN\$11.02 billion.

However, Statistics Canada estimates the total value of customer orders received over the Internet, with or without online payment, at CAN\$4.4 billion. Of this total,

\$4.2 billion were generated by the private sector. This amount represents only 0.2% of total operating revenues for 1999. In fact, in no industrial sector were Internet sales higher than 1.5% of that sector's total sales. Internet-based sales were 1.3% of total operating revenue in accommodation and food services, 1.0% in information and cultural industries, 0.8% in professional, scientific and technical services, and less than 0.5% in all other industrial sectors. (See Table 4.)

According to the same Statistics Canada data, in Canada, Internet sales reached \$610.6 million in 1999. This represents 0.2% of total retail sales in 1999. In the United States, retailers sold US\$5.2 billion worth of goods and services on the Internet during the fourth quarter of 1999, according to the Census Bureau of the Department of Commerce. This represented 0.6% of total sales in the US retail sector for this quarter.

### Sources:

Industry Canada, *Canadian Internet Commerce Statistics Summary Sheet*, August 22, 2000, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf> based on data from International Data Corporation (IDC).

Statistics Canada, *The Daily, E-commerce and business use of the Internet*, August 10, 2000, document available on the Internet at <http://www.statcan.ca/Daily/English/000810/d000810a.htm>.

## Q7. How quickly is online commerce growing?

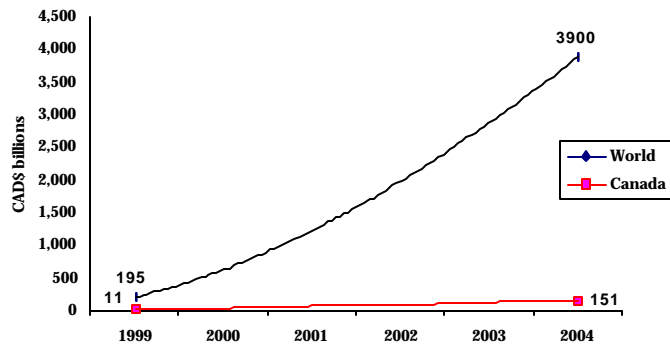
According to International Data Corporation (IDC), the growing digital global market will go from CAD\$195.39 billion in 1999 to \$404 billion in 2000, to reach \$3.6 trillion in 2004.

The IDC forecasts for the private sector share of the Canadian market on the Internet suggest that it will grow about 13 times more quickly during this period. In fact, it is estimated that Canada generated CAD\$11.02 billion in 1999, which represents 6.8% of the world share. In 2004, this figure should reach CAD\$151.5 billion, representing 3.9% of the world share.<sup>6</sup>

Globally, Internet commerce generated CAD\$195.39 billion in 1999. In 2000, this figure will read CAD\$404 billion, and 2004 alone will generate \$3.9 trillion in commerce. The growth of electronic commerce is exponential.

<sup>6</sup> Decreasing estimates of the proportion of the Canadian share of the global market are due mainly to growth in the European, Asian, Pacific and South American markets. In fact, the forecasts estimate that the global market shares will increase for all except the American and Canadian markets. Nevertheless, the forecasts state that the Canadian market capital will increase very quickly.

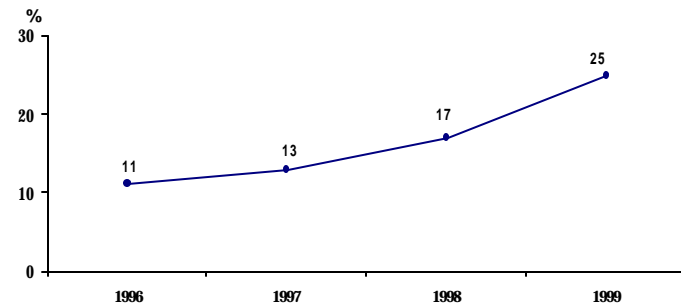
**Figure 10:** Global electronic commerce: current status and forecasts



Source: International Data Corporation, 2000 cited in *Canadian Internet Commerce Statistics Summary Sheet*, prepared by the Electronic Commerce Task Force, November 7, 2000.

Furthermore, the number of Canadian Internet users who have made a purchase via the Internet (placing an order with or without online payment) is constantly growing. One in four Internet users has already shopped online. In addition, in the last three years, the percentage of Canadians hooked up to the Internet who have made a purchase online has more than doubled, going from 11% in 1996 to 25% in 1999.

**Figure 11:** Proportion of Canadian Internet users who have made a purchase via the Internet (placing an order with or without online payment)



Source: AC Nielsen, *The Canadian Internet Survey 1996, 1997, 1998, 1999, 2000* cited in *Canadian Internet Commerce Statistics Summary Sheet* prepared by the Electronic Commerce Task Force, November 7, 2000.

**Sources:**

AC Nielsen, *The Canadian Internet Survey, 1996, 1997, 1998, 1999, 2000*, cited in *Canadian Internet Commerce Statistics Summary Sheet*, prepared by the Electronic Commerce Task Force, November 7, 2000, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf>.

Industry Canada, in *Canadian Internet Commerce Statistics Summary Sheet*, August 22, 2000, document available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf> based on data from

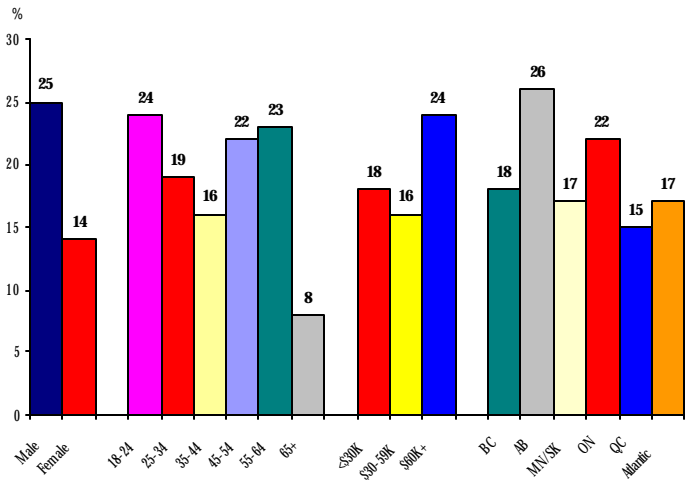
International Data Corporation (IDC).

**Q8. Who engages in electronic commerce?**

Males, Albertans, people who have had Internet access for more than three years and those with high weekly Internet use (more than 10 hours per week) are the most likely to have purchased a product via the Internet.

In comparison, Quebecers, females, people aged 65 or over, those who have had Internet access for less than a year and those who use the Internet less than five hours per week are the least likely to have purchased a product or service online. (See Table 5.)

**Figure 12:** Proportion of Canadians who have purchased products/services online (1999)



Source: The Angus Reid Report, *Canadians' Internet and E-commerce Activities*, July/August 1999.

It is also interesting to note that among those who made purchases via the Internet, the average amount spent was \$560. Nevertheless, it should be pointed out that a small group of Internet users (9%) have inflated this average by having spent more than \$1,000 via the Internet, whereas half of the users (45%) reported purchases between \$51 and \$300. The most popular products or services purchased online are books/magazines (29%), computer software (23%) and CDs/cassettes (16%) compared with clothing (9%), travel services (6%), concert tickets, computers/hardware and general services (5% each).



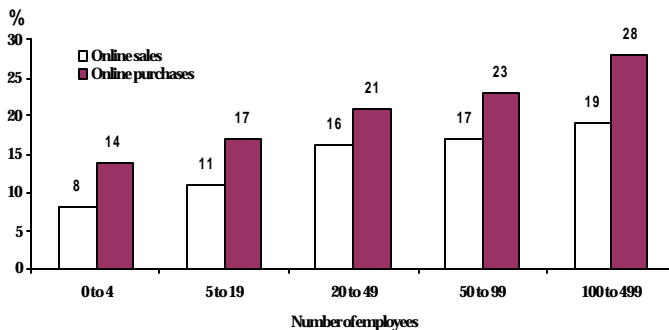


## Canadian businesses

From a different perspective, Canadian businesses purchase and sell an increasing number of products via the Internet. Data for 1999 showed that more than one-in-ten businesses used the Internet to sell products. Conversely, more than four-in-ten businesses (44%) in the public sector used the Internet to purchase products compared with one in ten businesses (14%) in the private sector. It thus appears that public sector businesses are more likely to use electronic commerce than private sector businesses.

In addition, the size of SMEs seems to have an impact on the incidence of online business activities. There is a tendency for larger firms to be more inclined to use the Internet to sell or buy products. Thus, as illustrated in Figure 13, large SMEs (100 to 499 employees) are twice as likely to use the Internet to sell products or services than small SMEs (0 to 4 employees). Moreover, three-in-ten of large SMEs (100-499 employees) make purchases online compared with one in ten small SMEs (0-4 employees).

**Figure 13:** SMEs that buy/sell products and services online by size of firm, 2000



Source: CFIB Members opinion survey, T2 2000.

### Sources:

Musgreave, J., *The E-Business Revolution: Are You Ready?*, January 31, 2000, original version first published in the London Free Press, document available on the Internet at <http://www.pwcglobal.com>.

Industry Canada, *Review of Statistics Canada Survey*, August 2000, available on the Internet at <http://e-com.ic.gc.ca/english/documents/statsrev.pdf>.

AC Nielsen, *The Canadian Internet Survey, 1996, 1997, 1998, 1999, 2000*, cited in *Canadian Internet Commerce Statistics Summary Sheet*, prepared by the Electronic Commerce Task Force, November 7, 2000.

The Angus Reid Report, *Canadians' Internet and E-commerce Activities*, July/August 1999, p. 25-31.

Statistics Canada, *The Daily, E-Commerce and business use of the Internet*, August 10, 2000, document available on the Internet at <http://www.statcan.ca/Daily/English/000810/d000810a.htm>.

CFIB Members opinion survey, T2 2000, cited in *Canadian Internet Commerce Statistics Summary Sheet*, prepared by the Electronic Commerce Task Force, November 7, 2000, available on the Internet at <http://www.e-com.ic.gc.ca/using/en/e-comstats.pdf>.

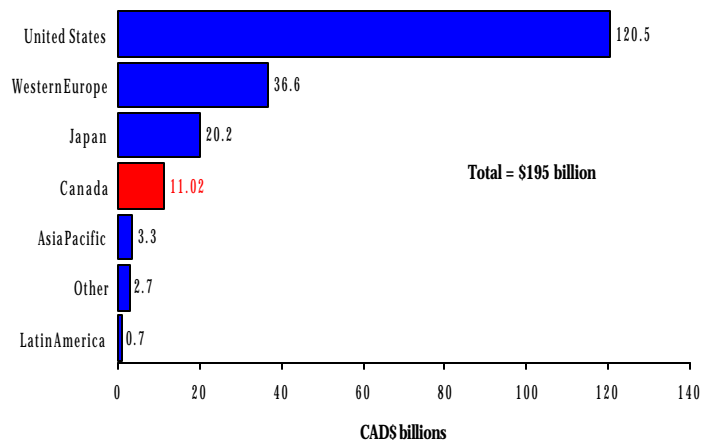
## Q9. What is our situation with respect to the international community?

Canada (19%) is among the pioneers in adopting electronic commerce, behind the United States (31%) and Sweden (21%), but at the same level as Switzerland (19%) in terms of the population that purchased a product or service online by the end of 1999.

Although Canada is among the leaders when it comes to countries that have adopted electronic commerce, it can claim first place, along with Sweden, with respect to the proportion of adults who reported conducting banking transactions online. In fact, 17% of Canadians and Swedes said they had conducted online banking transactions compared with 13% of Americans who responded at the end of 1999 that they had engaged in the same activity.

From an economic viewpoint, Canada is in fourth place in terms of the capital generated by electronic commerce activities in 1999. With CAD\$11.02 billion in capital generated in 1999, Canada is behind the United States (\$120.5 billion), Western Europe (\$36.6 billion) and Japan (\$20.2 billion).

**Figure 14:** Dollars generated by electronic commerce activities by country, 1999<sup>1</sup>



<sup>1</sup> Note: Graph shows "Internet commerce", a subset of electronic commerce. Includes the purchase or sale of goods and services via the Internet/World Wide Web, but excludes financial services.

Source: Murphy, Mike, *The Canadian E-Business Opportunities Roundtable - E-Business: A Small Business Perspective*, 2000.

### Sources:

Murphy, Mike, *The Canadian E-Business Opportunities Roundtable - E-Business: A Small Business Perspective*, 2000, available on the Internet at <http://www.ecom.ic.gc.ca/english/documents/ccs.pdf>.

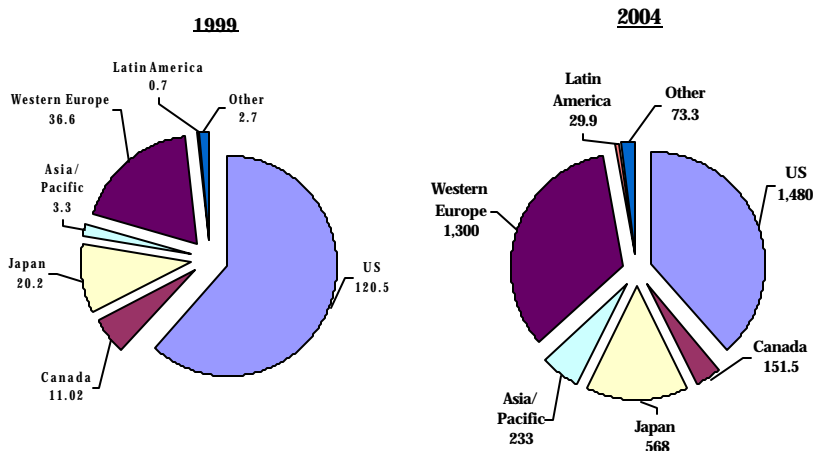
The Angus Reid Report, *Going Global on the World Wide Web*, Vol. 15, No. 4, July/August 2000.

## Q10. How rapidly is electronic commerce growing globally?

Globally, electronic commerce generated CAD\$195 billion in 1999. Forecasts for 2000 estimate total electronic commerce activity at CAD\$404 billion, while in 2004, this economic activity should generate close to CAD\$3.9 trillion.

During this period, Canada will benefit from a significant share of the world market. CAD\$11.02 billion was generated in 1999, and forecasts state that this economic value should reach \$151.5 billion in 2004. Canada would thus go from having 6% of the share of electronic commerce in 1999 to 4% in 2004, thereby seeing a slight drop. However, the loss in the Canadian market, and the US market as well, which will result from growth in the world market during this period, is due primarily to expansion in the Western Europe, Japan and Asian markets, and even the Latin American markets. These countries will thus see significant growth in their world share of electronic commerce. (See Table 6.)

**Figure 15:** World electronic commerce growth; Canada is well positioned to capitalize (in CAD\$ billions)



Note: (1) Graphs show "Internet commerce", a subset of electronic commerce. Includes the purchase or sale of goods and services via the Internet/World Wide Web, but excludes financial services.

(2) Based on the following exchange rate: US\$1 = CAD\$0.673 (Bank of Canada).

Source: International Data Corporation, 2000 inserted in *Review of Statistics Canada Survey*, August 2000.

<sup>7</sup> 80% of jobs related to electronic commerce are assumed cannibalized from traditional business operations.

<sup>8</sup> The *application* layer comprises companies that design products and services that are technically compatible with the IP (Internet) network and that are sufficient for conducting online business activities. This includes computer programs that are required to facilitate online transactions.

<sup>9</sup> The *infrastructure* layer comprises companies that, with their products and services, contribute to creating a secure IP (Internet) network infrastructure, which is a prerequisite for the Web and the proliferation of electronic commerce.

<sup>10</sup> The Canadian government's vision is to make Canada one of the most connected countries in the world. Electronic commerce is thus a key element in this agenda.

## Sources:

Industry Canada, *Review of Statistics Canada Survey*, August 2000, available on the Internet at <http://ecom.ic.gc.ca/english/documents/statsrev.pdf>.  
Murphy, Mike, The Canadian E-Business Opportunities Roundtable - *E-Business: A Small Business Perspective*, 2000, available on the Internet at <http://www.ecom.ic.gc.ca/english/documents/ccc.pdf>.

## Q11. Why give special importance to this commercial activity?

In Canada, in addition to the economic activities generated by the online sale of products and services, it is anticipated that in 2003, almost 200,000 positions will be related to the Internet market.

According to The Boston Consulting Group, jobs related to the Internet market should not be ignored. Forecasts estimate that jobs related to electronic commerce will reach 50,000 positions.<sup>7</sup> The *applications*<sup>8</sup> layer will generate 30,000 jobs, and the *infrastructure*<sup>9</sup> layer alone will generate 100,000 jobs. Thus for 2003 only, approximately 180,000 jobs related directly to the Internet economy are estimated. If the forecast growth rates are achieved, cyber-businesses would generate an annual increase in the Canadian GDP of approximately 6%.

The changes that have been forecast are only a fragment of the extent of the revolution being brought about by electronic commerce. In fact, considering how much the Internet has expanded in the last ten years and the changes that this phenomenon has had on daily life, it is easily conceivable that electronic commerce will become just as pervasive. With a decision like the Canadian government's to make Canada one of the most connected countries in the world,<sup>10</sup> electronic commerce was propagated nationally, bringing with it a whole new range of legal issues that the international community has also had to face. These issues are still outstanding and illustrate the problem of the proliferation of new services without regard for the potential repercussions. It is thus essential to properly understand the legal issues with respect to electronic commerce.

**Sources:**

Government of Canada, *Connecting Canada Information Kit*, 1999.  
 The Boston Consulting Group, *Report of the Canadian E-Business Opportunities Roundtable, FAST FORWARD: Accelerating Canada's Leadership in the Internet Economy*, January 2000, available on the Internet at <http://e-com.ic.gc.ca/english/documents/roundtable.pdf>.  
 Yap, Teck, *The Canadian Internet Economy 2000*, Bits Information Service, Toronto, 2000.

## Q12. What legal and judicial issues have been raised by the appearance of cyber-markets?

The *Canadian Electronic Commerce Strategy* adopted by the Canadian government in 1998 contains a response framework for the legal issues related to electronic commerce: Clarifying digital marketplace rules: legal, policy and regulatory frameworks.

The main legal issues that legislators are currently grappling with are focused on:

- 1) **The tax aspects:** How to define a regulated fiscal policy with respect to electronic commerce and how to govern electronic transactions?
- 2) **Regulations concerning disputes related to financial transactions via the Internet:** In this respect, the Canadian government provides a reference framework protecting consumers online that must be adopted voluntarily by businesses. But since disputes are large obstacles for consumers who are subject to fraudulent business practices, how to define a regulatory framework to govern this issue?
- 3) **The establishment of a framework to provide standards in this environment:** Because the Internet is international and each country and jurisdiction has its own standards and regulations, how to define a normative framework for electronic commerce that will promote and improve the electronic economy?
- 4) **The aspect of intellectual property protection:** How does the Internet environment affect intellectual property rights and how to subject the existing laws to this same technology framework?

Nevertheless, the government has adopted many measures to enable the development of an increasingly

secure and regulated commercial environment. The *Personal Information Protection and Electronic Documents Act* passed on April 13, 2000 is a good example. In addition, clarifying a definition for a cryptography policy gives Canadian Internet users a new secure framework. The establishment of a domain name system by the Canadian Internet Registration Authority to govern all ".ca" domain names will allow for better control. In fact, many stages have been completed but much work remains to be done if the government wishes to reach its objective of promoting the adoption of electronic commerce among the public.

In order to establish a framework to increase the practice of electronic commerce, on September 22, 1998, the government adopted the *Canadian Electronic Commerce Strategy*, which focuses on four aspects:

- (1) **Establishing a climate of trust with respect to electronic markets:** Cryptography, authentication, protection of personal information and consumer confidence;
- (2) **Clarifying digital marketplace rules:** Countering the barriers to the development of commerce by establishing a legal, policy, taxation and regulatory framework that is clear, precise and provides guidance;
- (3) **Consolidating the information infrastructure:** Ensuring that the network and the technologies destined for electronic commerce can support and advance this activity, and that they allow interoperability;
- (4) **Realizing the opportunities:** Understanding the importance of electronic commerce with respect to jobs and growth by improving the skills and awareness of the population and showing government leadership as model users.

This strategy clarified many aspects of electronic commerce and provided future paths for the legislative framework.<sup>11</sup>

**Sources:**

Government of Canada, *The Canadian Electronic Commerce Strategy*, September 22, 1998, document available on the Internet at [http://www.ecom.ic.gc.ca/english/ecom\\_eng.pdf](http://www.ecom.ic.gc.ca/english/ecom_eng.pdf).  
 Industry Canada, *Canadian Electronic Commerce Strategy*, document available on the Internet at <http://www.ecom.ic.gc.ca/english/60.html>.  
 The Boston Consulting Group, *Report of the Canadian E-Business Opportunities Roundtable, FAST FORWARD: Accelerating Canada's Leadership in the Internet Economy*, January 2000, available on the Internet at <http://e-com.ic.gc.ca/english/documents/roundtable.pdf>.

<sup>11</sup> In this respect, Table 7 in the appendices clarifies what has been done to date.

### Q13. What is the significance of a cryptography policy?

In general, governments face a conflict between two critical issues. Cryptography is an essential tool for ensuring the confidentiality of electronic documents, but at the same time, the practice limits the government's reach with respect to protecting the public and national safety.

Because cryptography is essential for maintaining the security of electronic documents, transactions and information, it provides all Internet users with a secure framework. However, that which is beneficial for the public with respect to safety is also advantageous for those who engage in unlawful activities. In this respect, the government faces a problem when dealing with such activities because its abilities to detect them are limited when it comes to protecting the public (for example, a network of people on the Internet using the latest cryptography technologies to carry out their unlawful activities) and national security (for example, a network of terrorists using the latest cryptography methods).

Furthermore, the issues of proof with respect to authenticating electronic documents (use of digital signatures), Certification Authorities (third parties that verify the identity of the author through recognition of a digital signature) and electronic cash all rely on cryptography methods. Thus, the security of electronic commerce also requires cryptography technology. As a result, this technical security is an essential element in legal safety. That is why, in October 1998, the Canadian government adopted *A Cryptography Policy Framework for Electronic Commerce: Building Canada's Information Economy and Society*.<sup>12</sup>

#### **Cryptography is thus essential to ensure the confidentiality of personal information.**

Cryptography is designed to protect the confidential nature of certain information, and it has existed for years. However, modern methods related to new communications technologies allow:

- 1) **Encryption:** To change plaintext (intelligible data) into ciphertext (data in its enciphered form). The word "encryption" is often used to mean specifically the transformation of data by the use of cryptography to produce

unintelligible data (encrypted data) to ensure its confidentiality.

- 2) **Decryption:** The inverse function of encryption; to change data in its enciphered form into intelligible data.
- 3) **Digital signature:** A cryptographic transformation of data which, when associated with a data unit (such as an electronic file), provides the services of origin authentication, data integrity, and signer non-repudiation (proof that the transaction has taken place or the message has been properly sent or received; neither the issuer nor the receiver can deny the exchange).

Encryption guarantees confidentiality, meaning that it protects the information against any unauthorized disclosure or viewing by mathematical scrambling of the original text.

Two types of cryptography are possible: secret key cryptography and public key cryptography. The former uses the same key to encrypt and decrypt the data, while the latter uses one key for encrypting data that can then only be decrypted by another key. The encryption key is public, meaning that everyone can use it, but the key for decrypting the message is personal to each user. Because the decryption key is specific to each individual, users can authenticate their document by adding an electronic signature. This last function also makes it possible to check whether the information was touched during transmission.

Cryptography techniques thus provide a foundation on which to build the trust required for electronic commerce because they establish measures to protect information, they protect communications and they authenticate the parties to a transaction. Specifically, they can also be used to develop digital signatures.<sup>13</sup> These signatures are very important for:

- 1) **Authentication:** proof that users are who they claim to be;
- 2) **Integrity:** proof that the data cannot be modified without detection;
- 3) **Non-repudiation:** proof that a transaction occurred, or that a message was sent or received (the parties cannot deny that the exchange occurred);

<sup>12</sup> For more detailed information, see: Government of Canada at <http://www.parl.gc.ca>

<sup>13</sup> **Table 8** in the appendices shows the various essential steps in creating a digital signature.



- 4) **Confidentiality:** only the designated recipient or authorized user can access or read the messages and data.

In an era when financial and business transactions are growing on an open network such as the Internet, a cryptography policy is essential. The security of personal information attached to simple electronic mail messages, financial or bank transactions and any other possibilities that Internet users have is clearly essential. If personal data is not protected on a network like the Internet, any individual can access this information with the help of simple software programs that are offered for free on the very same network. This information has an inestimable value for those who plan to use it, and its use specifically invades the privacy of people who might never become aware that a third party is using the information without their knowledge. Thus individuals and companies must take the measures required to ensure the confidentiality of their personal information.

In this regard, on April 13, 2000, the Canadian government passed the *Personal Information Protection and Electronic Documents Act* that is aimed at implementing a cryptography policy to promote the growth of electronic commerce:

- 1) by protecting personal information that is collected, used or disclosed in certain circumstances;
- 2) by providing for the use of electronic means to communicate or record information or transactions;
- 3) by allowing Canadian producers to export their products globally within the framework of international arrangements;
- 4) and which contains measures to maintain the capability of law enforcement agencies to ensure public safety.

With the adoption of this Act, the concerns about public safety are partially clarified. In fact, the Act makes it possible to:

- 1) criminalize the wrongful disclosure of keys (important elements that enable the encryption and decryption of data);
- 2) deter the use of encryption in the commission of a crime;

- 3) deter the use of cryptography to conceal evidence;
- 4) apply existing interception, search and seizure and assistance procedures to cryptographic situations and circumstances.

#### Sources:

Government of Canada, *Personal Information Protection and Electronic Documents Act*, available on the Internet at [http://www.parl.gc.ca/36/2/parlbus/chambus/house/bills/government/C-6/C-6\\_4/90052bE.html#1](http://www.parl.gc.ca/36/2/parlbus/chambus/house/bills/government/C-6/C-6_4/90052bE.html#1).  
Industry Canada, *Building Trust And Confidence In Electronic Commerce: A Framework For Electronic Commerce*, July 2000, document available on the Internet at <http://e-com.ic.gc.ca/english/documents/framework.pdf>.  
Industry Canada, *Summary of Canada's Cryptography Policy*, document available on the Internet at <http://e-com.ic.gc.ca/english/fastfacts/43d7.html>.  
Organisation for Economic Co-operation and Development (OECD), *Electronic Commerce Opportunities and Challenges for Government*, Paris, 1997, 83 pages.

## Q14. What is authentication of an electronic document?

Authentication of an electronic document consists primarily in the digital signature which encrypts and decrypts the message, the transaction or the transmission of data to approve the identity of the person.

Fundamentally, authentication is everything that involves the proof of what the user claims (such as access code, personal identification number (PIN), etc). However, the electronic authentication process is the ability to apply any verification method to any part of the message using a procedure that reveals, for example, the identity of the sender (or the author of the text), the authority of a person to enter into any given transaction, or the security level attributed by peripherals or computer programs. Cryptography functions are possible thanks to digital keys (which are nothing but a combination of 1s and 0s) that encrypt and decrypt electronic information.

One of the legal means of authentication, which takes the form of a digital signature on an open network like the Internet, can be made possible through the interaction of a trusted third party. Certification authorities (CAs),<sup>14</sup> which are businesses in the private sector in consultation with the public sector, enable the control of public keys and certificates that contain such keys. In addition to containing the public keys for users, the certificates issued contain information on their holders and their credentials.

<sup>14</sup> In October 1998, the Canadian government stated that it would not implement mandatory key recovery requirements or licensing regimes. Rather, it would encourage industries and the population to establish voluntary responsibility. In addition, it encouraged and supported industry-led accreditation of private sector certification authorities. According to Industry Canada's Cryptography Policy Framework for Electronic Commerce, some existing institutions, such as financial institutions, the Passport Office and Canada Post, could fulfil the role of certification authorities.

These data are attached to the owner entity and can then be signed electronically by the CAs, signatures that prove the author's claimed identity.

However, some financial institutions, industries or organizations specializing in cryptography already offer the services of a certification authority and are recognized as such. Thus, the cryptography methods used to make transactions secure can vary. In this framework, some legitimate questions exist, such as:

- 1) What is the nature of the keys employed (temporary keys that are deleted after use or long-term keys)?
- 2) How are the cryptography keys controlled at each stage of their life (generation to destruction)? Does the owner take care of this or does the certification authority?

Furthermore, the issue of ensuring the identity of parties to an electronic transaction is regulated by the CAs. The goal of these authorities is to facilitate commerce by ensuring the identity of the parties. But these agencies are essentially a national authority. The identification certificates that they issue are not yet recognized by their foreign counterparts. Consequently, national legislations must be harmonized with respect to certification authorities in order to enable cross-certification, meaning that authority A recognizes the identification certificate issued by authority B located in a foreign country.

#### Sources:

Benyekhlef, Karim, *Commerce électronique: Normes et politiques*, Policy Options politiques, June 1998, Vol. 19, No. 5.  
 News Release, Industry Canada, *Minister Manley Outlines Canadian Cryptography Policy*, Ottawa, October 1, 1998, document available on the Internet at <http://e-com.ic.gc.ca/english/releases/41d6.html>.  
 Electronic Commerce Task Force, *Backgrounder: Summary of Canada's Cryptography Policy*, document available on the Internet at <http://e-com.ic.gc.ca/english/fastfacts/43d7.html>.  
 Electronic Commerce Task Force, *A Cryptography Policy Framework for Electronic Commerce: Building Canada's Information Economy and Society*, document available on the Internet at <http://e-com.ic.gc.ca/english/crypto/631d15.html>.  
 Industry Canada, *Building Trust and Confidence: A Framework for Electronic Authentication*, July 2000, document available on the Internet at <http://e-com.ic.gc.ca/english/documents/framework.pdf>.

### Q15. What is Bill C-6, the *Personal Information Protection and Electronic Document Act*?

This Act is a provision taken by the federal government to improve the security of individual privacy and to counter

abusive use by organizations in the collection, use and disclosure of personal information for unreasonable purposes.

Protection of the privacy of users is an important issue. Establishing a consumer profile through linking (gathering personal data), raises problems with respect to national legislation governing the protection of personal information. For example, consumer activities on the Internet, just like simple browsing (surfing), leave electronic traces that merchants can use to establish consumer profiles or databases for direct marketing purposes.

The *Personal Information Protection and Electronic Documents Act*<sup>15</sup> was given assent on April 13, 2000. Henceforth, this new Act governs the collection, use and disclosure of personal information. In addition, it strikes a balance between each citizen's right to privacy and the need for organizations to collect, use or disclose personal information for reasonable purposes. The Act comprises two parts. Part 1 establishes the rules for governing the collection, use and disclosure of personal information, and Part 2 creates an electronic alternative for doing business with the federal government.

#### Part 1: Rules governing the collection, use and disclosure of personal information

The principles governing this new Act have been inspired by CSA International's *Model Code for the Protection of Personal Information*, which was recognized as a national standard in 1996. This code defines how organizations can collect, use and disclose personal information, and describes the right of citizens to have access to their personal information and to have it amended as appropriate. Thus, the Act is governed by ten principles:

1. **Accountability:** An organization is responsible for personal information under its control and shall designate an individual or individuals who are accountable for the organization's compliance with the following principles.
2. **Identifying purposes:** The purposes for which personal information is collected shall be identified by the organization at or before the time the information is collected.
3. **Consent:** The knowledge and consent of the individual are required for the collection, use or disclosure of personal information, except when inappropriate.

<sup>15</sup> For more detailed information, see: Government of Canada at <http://www.parl.gc.ca>.



4. **Limiting collection:** The collection of personal information shall be limited to that which is necessary for the purposes identified by the organization. Information shall be collected by fair and lawful means.
5. **Limiting, use, disclosure and retention:** Personal information shall not be used or disclosed for purposes other than those for which it was collected, except with the consent of the individual or as required by law. Personal information shall be retained only as long as necessary for the fulfilment of those purposes.
6. **Accuracy:** Personal information shall be as accurate, complete and up-to-date as is necessary for the purposes for which it is to be used.
7. **Safeguards:** Personal information shall be protected by security safeguards appropriate to the sensitivity of the information.
8. **Openness:** An organization shall make readily available to individuals specific information about its policies and practices relating to the management of personal information.
9. **Individual access:** Upon request, an individual shall be informed of the existence, use and disclosure of his or her personal information and shall be given access to that information. An individual shall be able to challenge the accuracy and completeness of the information and have it amended as appropriate.
10. **Challenging compliance:** An individual shall be able to address a challenge concerning compliance with the above principles to the designated individual or individuals accountable for the organization's compliance.

However, the Act also contains provisions to ensure that certain legal exceptions to the consent requirement are included. In fact, an individual's consent is not required

- 1) if the action clearly benefits the individual or if obtaining permission could compromise the information's accuracy;
- 2) where such data can contribute to a legal investigation or aid in an emergency where people's lives and safety could be at stake; and

- 3) if disclosure aids matters of legal investigation or facilitates the conservation of historically important records.

## Part 2: Electronic alternative for doing business with the federal government

Part 2 of the Act, placed in a legal framework, clarifies the conditions under which the courts assess the reliability of electronic documents introduced as evidence. Thus federal departments, agencies and boards have the authority to decide which requirements must be satisfied by electronic means (in effect since May 2000). A key component of the legislation is the concept of secure electronic signature. In addition, the new legislation provides the federal government with a new way of doing business using electronic means. It puts the electronic alternative on the same footing as paper for working within the federal government. Nevertheless, the security issues are governed by the cryptography policies.

### Sources:

Benyekhlef, Karim, *Commerce électronique: Normes et politiques*, Policy Options politiques, June 1998, Vol. 19, No. 5.  
 Government of Canada, *Personal Information Protection and Electronic Documents Act*, April 13, 2000, document available on the Internet at [http://www.parl.gc.ca/36/2/paribus/chambus/house/bills/government/C-6/C-6\\_4/90052bE.html#1](http://www.parl.gc.ca/36/2/paribus/chambus/house/bills/government/C-6/C-6_4/90052bE.html#1).  
 Industry Canada, *Privacy: The protection of personal information*, information available on the Internet at <http://e-com.ic.gc.ca/english/privacy/632d1.html>.  
 Industry Canada, *Building Trust and Confidence: A Framework for Electronic Authentication*, July 2000, document available on the Internet at <http://e-com.ic.gc.ca/english/documents/framework.pdf>.

## Q16. What provisions have been taken to protect consumers online?

Many principles were developed by The Working Group on Electronic Commerce and Consumers to protect consumers online.

At the micro-legal level, how is consumer protection to be ensured in electronic environments when this protection varies in existing legislation in Canada? In this respect, the issue of the proof of a transaction also arises. In Quebec, lawmakers have adopted specific evidence legislation for electronic transactions. The provisions, which are not based on a specific technology, make it much easier to accept electronic documents as evidence. However, this approach is not being applied everywhere. It is thus necessary to take national provisions with respect to the law of evidence into consideration. Consequently, does a merchant who has a Website have to take the country of

origin of the purchaser into account before agreeing to a transaction when the merchant knows that the purchaser's country does not recognize an electronic signature or the validity of a contract concluded via electronic means?

In this perspective, the Canadian government attempted to develop principles that consumers and vendors should follow. Listed under three guiding principles, the eight principles are set out in *Principles of Consumer Protection for Electronic Commerce: A Canadian Framework* developed by the Working Group on Electronic Commerce and Consumers.

- 1) **Equivalent protection:** This principle sets out that electronic commerce should offer the same protection as traditional forms of commerce. Consumer protection should exist regardless of the medium of commerce.
- 2) **Harmonization:** This principle states that the Canadian government should adapt existing consumer protection laws to apply to electronic commerce, and should strive to harmonize legal provisions to avoid requiring any jurisdiction to lower its standards.
- 3) **International consistency:** This principle sets out that the Canadian consumer protection framework should be consistent with directions in consumer protection established by international bodies such as the Organisation for Economic Co-operation and Development (OECD).

These three guiding principles transcend the eight principles that businesses should adhere to voluntarily to enhance consumer confidence online. The eight principles state that:

- 1) Consumers should be provided with clear and sufficient information to make an informed choice about whether and how to make a purchase;
- 2) Vendors should take reasonable steps to ensure that the consumer's agreement to contract is fully informed and intentional;
- 3) Vendors and intermediaries should respect the privacy principles set out in CSA

International's *Model Code for the Protection of Personal Information*;

- 4) Vendors and intermediaries should take reasonable steps to ensure that transactions in which they are involved are secure. Consumers should act prudently when undertaking transactions;
- 5) Consumers should have access to fair, timely, effective and affordable means for resolving problems with any transaction;
- 6) Consumers should be protected from unreasonable liability for payments in transactions;
- 7) Vendors should not transmit commercial e-mail without the consent of consumers, or unless a vendor has an existing relationship with a consumer;
- 8) Government, business and consumer groups should promote consumer awareness about the safe use of electronic commerce.

#### Sources:

- 1) Benyekhlef, Karim, *Commerce électronique: Normes et politiques*, Policy Options politiques, June 1998, Vol. 19, No. 5.
- 2) Working Group on Electronic Commerce and Consumers, *Principles of Consumer Protection for Electronic Commerce*, November 1999, document available on the Internet at <http://strategis.ic.gc.ca/pics/ca/principlese.pdf>.

## Q17. What is a digital signature?

A digital signature is created by an identifier that is attached to, or logically associated with, an electronic document.

A digital signature is attached to an electronic document and has functions similar to those of an original signature.<sup>16</sup>

From the theoretical aspect, a digital signature is a cryptographic transformation of data which, when associated with a data unit (such as an electronic file), provides the services of origin authentication, data integrity, and signer non-repudiation.

The issues of proof (use of an electronic signature), certification authorities and electronic cash are legitimized through cryptography. Today, the proof of identity has been made possible thanks to the electronic

<sup>16</sup> A "digital signature" which is created with the help of a private key is almost always taken to mean an electronic signature that is generated using public key cryptography. For more extensive information on digital electronic signatures, see the document published by Industry Canada, *Building Trust and Confidence: A Framework for Electronic Authentication*, July 2000, available on the Internet at <http://e-com.ic.gc.ca/english/documents/framework.pdf>.





signature. With the *Personal Information Protection and Electronic Documents Act*, the computerized medium is now recognized. The digital or electronic signature (a key component of this new legislation) is henceforth legally recognized. Legislation clarifies how the courts can recognize the legitimacy of electronic signatures (necessarily associated with a legal entity) and even gives the courts the right to determine the legal status of digital signatures. Naturally, the proposed legislation gives federal departments, agencies and boards the authority to decide the requirements of electronic documents so that they carry the same weight as paper documents. In addition, a secure electronic signature is the electronic proof of the document. Legislation also provides a framework that recognizes electronic documents that are introduced as evidence to the courts (even though this practice has existed for some time). It specifies how the courts should assess the reliability of an electronic document that is introduced as evidence and helps in recognizing secure electronic signatures and their role with respect to electronic documents.

#### Sources:

Benyekhlef, Karim, *Commerce électronique: Normes et politiques*, Policy Options politiques, June 1998, Vol. 19, No. 5.  
 Government of Canada, *Personal Information Protection and Electronic Documents Act*, April 13, 2000, document available on the Internet at [http://www.parl.gc.ca/36/2/parlbus/chambus/house/bills/government/C-6/C-6\\_4/90052bE.html#1](http://www.parl.gc.ca/36/2/parlbus/chambus/house/bills/government/C-6/C-6_4/90052bE.html#1).  
 Industry Canada, *Building Trust and Confidence: A Framework for Electronic Authentication*, July 2000, document available on the Internet at <http://e-com.ic.gc.ca/english/documents/framework.pdf>.  
 Solicitor's Journal, *Electronic Communications Bill*, January 28, 2000, Vol. 144, No. 3, p. 66-67.

### Q18. What role has the government played to date in implementing a regulatory framework for the Internet environment?

The government's role has been primarily in the area of adopting uniform legislation. In 1998, the *Uniform Electronic Evidence Act* and in April 2000, the *Personal Information Protection and Electronic Documents Act* are the main outcomes. Besides this legislative framework, the Canadian Internet Registration Authority (CIRA) already regulates the ".ca" domain names.

Subsequent to the report prepared by the Canadian Radio-Television and Telecommunications Commission (CRTC) in 1999 on the services associated with the new media, the

Commission confirmed its intent not to grant permits for Internet-based services and not to establish measures governing this environment. This decision influenced the government, which preferred to take an approach to promote a sound electronic economy.

In this respect, the government attempted to provide a coherent agreement between the provincial and federal level to clarify the rules of the market. The *Uniform Electronic Evidence Act*, which sets out that all electronic documents are legally valid, and the *Personal Information Protection and Electronic Documents Act*<sup>17</sup> are but the best examples of the uniform legislation that establishes clear rules for the electronic market. The government efforts to provide uniform legislation have made it possible to clarify the issues with respect to electronic signatures and electronic documents as proof.

On the national level, regulatory control over electronic commerce and its environment in the future will be in the form of authentication certificates. The Canadian Certification Authorities (CAs) who attribute these certificates (certificates that contain all the information about the owners, such as their names, addresses and occupations, to authenticate the origin and author of the electronic message) adhere to a very strict regulatory framework. Consequently, all users and businesses that engage in secure electronic commerce activities will be registered by the CAs.

On another front, the Canadian Internet Registration Authority must regulate the ".ca" domain names.<sup>18</sup> This non-profit Canadian corporation is responsible for operating the country code domain for all Canadians in an efficient and professional manner. Concretely, this means registering all sites and organizations with an electronic address (URL) belonging to the ".ca" domain. The internationally established policy governing the regulation of domain names that is co-ordinated by the United Nations controls the registration of these names.

The legal issues of the regulatory policy are set out under privacy legislation governed by the *Personal Information Protection and Electronic Documents Act*. Respect for the information collected should follow the rules previously established by this Act.

#### Sources:

Canadian Internet Registration Authority, *Frequently Asked Questions*, document available at [http://www.cira.ca/en/faq\\_menu.html](http://www.cira.ca/en/faq_menu.html).

<sup>17</sup> For more detailed information on this legislation, see the Government of Canada site at <http://www.parl.gc.ca>.

<sup>18</sup> The Internet Domain Name System consists of an organized hierarchical directory of all domain names and their corresponding computers. A top-level domain is used to designate the type of organization or the country of origin. Generic top-level designators are commonly three-letter suffixes like .com, .net, .org, .edu. Country code top-level domains are commonly two-letter suffixes like .ca, .us, .uk, etc, as assigned by the United Nations. .ca is the country code Top Level domain (ccTLD) designating Canada. .com is the generic Top Level domain (gTLD) designating commercial activities.

Government of Canada, *Personal Information Protection and Electronic Documents Act*, April 13, 2000, document available on the Internet at [http://www.parl.gc.ca/36/2/parlbus/chambus/house/bills/government/C-6/C-6\\_4/90052bE.html#1](http://www.parl.gc.ca/36/2/parlbus/chambus/house/bills/government/C-6/C-6_4/90052bE.html#1).

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Industry Canada, *Building Trust and Confidence In Electronic Commerce: A Framework for Electronic Authentication*, July 2000, document available at <http://e-com.ic.gc.ca/english/documents/framework.pdf>.

## Q19. What are the issues related to a tax policy intended to regulate cyber-commerce and its environment?

Because a tax policy involves many regulatory problems with respect to the Internet market, in September 1998, the Canadian government clearly identified its position in this framework: a neutral approach to electronic commerce which avoids Internet-specific taxes.

In principle, goods and services purchased in electronic environments are also subject to taxes. The purchase of tangible goods that are ordered and paid for via the Internet is less problematic because the goods are shipped by traditional means. They can then be taxed by the customs authorities. However, the digital environment makes the task more difficult. For example, purchasing electronic products online, such as software that is downloaded (from the host computer to the purchaser's computer), is very difficult for tax authorities to detect.<sup>19</sup>

In the tax application framework, electronic commerce poses a problem. From the legal aspect, who collects the tax? A consensus needs to be established in the international community to avoid a situation in which an international electronic transaction is taxed twice or not taxed at all. In addition, legislation under the Common Law determines that the head office of the "central mind and management" where the executives meet, and the permanent establishment of a business allow the activities to be taxed. But a site's electronic address (IP address) is in no way associated with a business's permanent address and it is rarely possible to establish the link between the two unless the permanent address is indicated on the Internet site. In addition, electronic transmission completely avoids the application of customs duties. Thus, the Report of the Minister's Advisory Committee on Electronic Commerce in 1998, *Electronic Commerce and Canada's Tax Administration*,<sup>20</sup>

which examined these tax issues, recommends two possibilities for applying a tax in the case of electronic commerce: 1) the location where the consumer connects to engage in a transaction; and 2) the location where the server is kept.

According to the OECD, the main problem with a taxation framework lies mainly in the intangible environment of electronic commerce: who taxes where? The problem becomes much more complex in countries like Canada and even the United States because they consist of provinces and states with different tax systems. Usually, companies that are in a different state than the customer ordering a product are not authorized to collect a tax applied in the state in which the customer resides. Thus, in the United States, many people are arguing that service providers, regardless of their location, should become legal agents in order to collect taxes from any business, regardless of location, that uses the Internet to sell its products. If this battle is won, companies would be legally empowered to collect the local taxes of their client regardless of the place of residence. However, this option seems unlikely, because it would hinder the progress of electronic commerce.

Currently, the Canada Customs and Revenue Agency (CCRA) is examining many issues related to the fiscal aspect. The recommendations made in the report by the advisory committee in 1998, which affirms Canada's position based on the principles of neutrality, fairness, certainty and simplicity,<sup>21</sup> are only somewhat applicable. To date, most of the work completed has concentrated on examining the main implementations required to obtain an international consensus with respect to taxation and tariffs. Numerous legal issues remain that the taxation framework has not resolved.

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Benyekhlef, Karim, *Commerce électronique: Normes et politiques*, Policy Options politiques, June 1998, Vol. 19, No. 5.

Government of Canada, *The Canadian Electronic Commerce Strategy*, September 22, 1998, document available on the Internet at [http://www.ecom.ic.gc.ca/english/ecom\\_eng.pdf](http://www.ecom.ic.gc.ca/english/ecom_eng.pdf).

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Richards, G. and Tétrault, M., *Income Tax and Electronic Commerce: Where in the World?*, in Osgoode Hall Law School, *Commerce on the Internet: Legal Issues*, Ed. Emond Montgomery Publications, November 1998.

<sup>19</sup> In Europe, a similar option has been considered. It is called the "bit tax". This involves taxing the transmission of data generated by the transaction instead of taxing the product. However, many technical problems make this taxation system difficult to apply. For more information, consult the OECD, *Electronic Commerce Opportunities and Challenges for Government*, Paris, 1997, 83 pages, or the Internet site at [http://www.oecd.org/subject/e\\_commerce/](http://www.oecd.org/subject/e_commerce/).

<sup>20</sup> For more detailed information on the Report, consult the site at <http://www.ccra-adrc.gc.ca/tax/business/ecom/index-e.html>.

<sup>21</sup> For more detailed information on the principles, see the Report at <http://www.ccra-adrc.gc.ca/tax/business/ecom/index-e.html>.



## Q20. How will electronic technology affect the issues of intellectual property?

The Internet has an impact on two intellectual property rights (trademarks and copyrights), because of its multiple jurisdictions and its nature.

First of all, the meaning of intellectual property should be defined. This term traditionally refers to copyright and related rights, as well as design, trademark and patent rights. However, two of these are particularly affected by the Internet: trademarks and copyrights.

The current international system to protect intellectual property (IP) is restricted to "ideas" and, in particular, the expression of ideas in the physical environment of the media (print, recording, video, film, etc). The challenge for governments is to redefine the parameters of legislation to apply to the Internet environment. Currently, legislation governing IP rights is divided between copyright laws for literary owners and patents for technology process and specifications.

The arrival of the Internet raises many questions. For example, with respect to computer programs that are already governed by copyright legislation, the question arises as to whether the algorithms running the program should be regulated by patents. Other challenges can be included in this aspect which comprises many other questions that are just as unclear. With respect to enforcing legislation related to the system of IP rights, the distribution of information, which is highly extolled, brings with it the problem that undetectable copies and redistribution are able to circumvent application of the law. Thus, adaptation of legislation and the cryptography policy must work together along the same lines to reinforce this aspect.

On another front, the Internet environment also raises a limitation of IP rights and the related issues. In effect, how can trademarks be controlled, and databases and domain names be protected? Naturally, a number of international agreements allow Canada to co-ordinate the attribution of the ".ca" domain name<sup>22</sup>, but in particular, these agreements also allow Canada to review its IP policies. It was in this context in 1997 that the *Copyright Act*<sup>23</sup> was amended to adapt it to a modern context.

Because the stakes are high, the government is presently examining the possibility of making Internet service providers and other intermediaries responsible for violations of IP legislation. Thus, emphasis could be put on tighter control of distribution and sites.

Finally, the issue concerning trademarks and domain names leads to the conviction that the rights governing trademarks in particular must be carefully determined. It is definitely conceivable that the establishment of trademarks on the Internet is as important as in the traditional environment. Nevertheless, because of the environment of electronic commerce, which involves no human interaction between the vendor and the purchaser, the trademark, a sign of confidence and reputation, becomes a key for business sales. Incidentally, from the international viewpoint, the Internet environment faces the main problem that trademark legislation is regulated by national laws. The various jurisdictions must thus come to a consensus for the proper support of this proposal.<sup>24</sup>

### Sources:

Bertrand, A. and Piette-Coudol, T., *Internet et le droit*, Ed. Puf, Coll. Encyclopédique, Paris, 1998.  
Industry Canada, *Intellectual Property Protection*, document available on the Internet at <http://e-com.ic.gc.ca/english/strat/643.html>.  
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World Intellectual Property Organization (WIPO), *Primer on Electronic Commerce and Intellectual Property Issues*, May 2000, document available on the Internet at <http://ecommerce.wipo.int/primer/primer.html>.

## Q21. How does the government plan to introduce standardization in the area of electronic commerce?

The government is currently in discussions to establish international and national standards regarding electronic commerce. Many options are being considered and some have already been undertaken.

Presently, the Canadian government is trying to introduce standards that Internet and electronic commerce users will have to respect. Naturally, the fact that the Internet is global greatly complicates the various facets of the issue. In this respect, Canada plays a prominent role in ICANN (Internet Corporation for Assigned Names and Numbers)<sup>25</sup>, an international organization responsible for the registration and governance of top level domain names. In addition, as mentioned earlier, a private sector

<sup>22</sup> For more detailed information on the program, see question 17.

<sup>23</sup> For more detailed information on the act, see the Government of Canada site (<http://www.parl.gc.ca>), or for documents discussing the subject, see <http://strategis.ic.gc.ca/SSG/ip00001e.html>.

<sup>24</sup> For more detailed information on this subject, consult the site of the World Intellectual Property Organization at <http://ecommerce.wipo.int>.

<sup>25</sup> For more detailed information on this organization, visit the Internet site at <http://www.icann.org>.

body, the Canadian Internet Registration Authority (CIRA), will be responsible for managing ".ca" as Canada's domain name registry, thereby ensuring effective regulation of domain names in Canada.<sup>26</sup>

In March 1999, a standards framework for electronic commerce was approved by the Telecommunications Standards Advisory Council of Canada (TSACC). This framework covers the infrastructure, applications and business process components of electronic commerce standards. However, the framework provides only one reference point for the Canadian government and the private sector to undertake future work on the issue.<sup>27</sup>

On another front, the Canadian government is in the process of reinforcing the Internet infrastructure in Canada to help in spreading information and promoting electronic commerce activities. Thus, it has entered into an agreement with the Canadian Network for the Advancement of Research, Industry and Education (CANARIE) to develop the Canadian high-speed Internet network (an infrastructure based on optical fibre). The government thereby wishes to provide Canadians with the means to benefit from the Internet and give a new technology framework to this computerized environment.

On the international scene, Canada is presently attempting to establish standards for the interoperability of computer networks. Thus Canada, with the assistance of TSACC and the Standards Council of Canada, is taking steps to follow the path set out by the Joint Technical Committee (JTC) of the International Organization for Standardization and the International Electrotechnical Commission, which have been defining the key impediments to electronic commerce. They thereby wish to establish standards with respect to information technology enablement, localization and multilingualism, sector-to-sector impediments and cultural adaptability.

**Sources:**

Industry Canada, *Network Access and Availability*, information available on the Internet at: <http://e-com.ic.gc.ca/english/strat/652.html> and <http://e-com.ic.gc.ca/english/strat/651.html>.

Industry Canada, *Growth of electronic commerce is underpinned by the strength of the information infrastructure...*, document available on the Internet at [http://ecom.ic.gc.ca/english/strat/60\\_3.html](http://ecom.ic.gc.ca/english/strat/60_3.html).

<sup>26</sup> Two reports prepared by a special committee of experts on the issues in the international debate on reforming the Domain Name System (DNS) are available on the Internet at <http://e-com.ic.gc.ca/english/strat/651d1.html> and <http://e-com.ic.gc.ca/english/strat/651d2.html>.

<sup>27</sup> For more detailed information on the issue, visit the Industry Canada site, *Internet Governance*, <http://www.e-com.gc.ca/english/60.html>.



**Table 1: Proportion of households using the Internet from home, by purpose of use, 1999**

Purpose of Use	All Households			Regular Home-use Households		
	1997	1998	1999	1997	1998	1999
E-mail	13.3	19.3	26.3	83.1	85.6	91.7
Electronic banking	3.1	5.5	8.0	19.6	24.4	27.7
Purchasing goods/services	1.5	2.5	5.5	9.2	10.9	19.0
Medical information	--	9.6	15.6	--	42.5	54.2
Formal education/training	--	6.8	9.2	--	30.0	32.0
Government information	--	8.2	12.7	--	36.4	44.1
Other specific information	--	15.3	24.4	--	67.9	85.1
General browsing	13.5	17.6	24.3	84.7	78.1	84.7
Playing games	--	7.8	12.3	--	34.4	42.7
Chat groups	--	5.7	7.5	--	25.4	26.2
Obtaining/saving music	--	--	7.8	--	--	27.1
Listening to radio	--	--	5.0	--	--	17.5
Other Internet services	2.2	2.6	10.0	13.7	11.6	34.7

Note: (--) indicates a category of use not asked in that year's survey.

Source: Statistics Canada, Connectedness Series, November 2000.

**Table 2: Socio-economic characteristics of Internet users, 2000**

	%
<b>National average for 2000:</b>	<b>66</b>
<b>Sex</b>	
Male	70
Female	63
<b>Age</b>	
18-34 years	83
35-54 years	73
55 years and over	38
<b>Education</b>	
No high school diploma	22
High school	41
Post-secondary	60
University	79
<b>Occupation</b>	
Student	91
Labourer	41
Sales/Administration	74
Professional/Executive	77
<b>Income</b>	
Under \$40,000	50
\$40,000 to \$60,000	67
Over \$60,000	83

**Source:**

The Angus Reid Report, Canadians' Internet and E-commerce Activities, July/August 1999.  
The Angus Reid Report, Canadian Internet Users' Behaviour, March/April 2000.



**Table 3: Daily use of the Internet or e-mail**

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	%
<b>Canada Total</b>	<b>55</b>
<b>Sex</b>	
Male	57
Female	54
<b>Age</b>	
18 to 29 years	59
30 to 44 years	58
45 to 59 years	55
60 years and over	39
<b>Occupation</b>	
Professional/Administrative	66
Technical	62
Office/Sales	61
Skilled and semi-skilled labour	37
Unskilled labour	44
<b>Income</b>	
Under \$15,000	41
\$15,000 to \$25,000	50
\$25,000 to \$35,000	53
\$35,000 to \$50,000	55
\$50,000 to \$70,000	56
\$70,000 and over	62
<b>Education</b>	
No high school diploma	32
High school	49
College	49
University	66
<b>Cities</b>	
Montreal	68
Vancouver	61
Toronto	56
<b>Population density</b>	
Under 5,000	48
5,000 to 100,000	49
100,000 to 1,000,000	58
1,000,000 and over	61

Source: Trends and Issues, *INTERNET USE*, Environics, Focus Canada, 2000-1.

**Table 4: Canadian Internet sales revenue for 1999 (in \$ millions)**

	<b>Internet sales with or without online payment</b>	<b>Internet sales as percentage of total operating revenue</b>
Manufacturing	900.0	0.2
Retail trade	610.6	0.3
Information and cultural industries	552.7	1.0
Accommodation and food services	429.3	1.3
Professional, scientific and technical services	406.1	0.8
Finance and insurance	320.8	0.1
Transport and warehousing	164.3	0.3
Wholesale trade	156.3	0.1
Real estate and rental and leasing	114.8	0.3
Other services (except public administration)	27.4	0.1
Utilities	15.8	0.1
Mining and oil and gas extraction	15.0	0.0
Health care and social assistance (private sector)	10.0	0.1
Other industry sectors	459.6	0.4
<b>All private sector</b>	<b>4,179.7</b>	<b>0.2</b>

Source: Statistics Canada, The Daily, *E-Commerce and business use of the Internet*, August 2000.





**Table 5: Electronic commerce activities among Canadian adults with Internet access, 1999**

	<b>Comparison shopped for items that were subsequently purchased in a store</b>	<b>Conducted online transactions with a financial institution</b>	<b>Purchased products and services online</b>
	(%)	(%)	(%)
Canadians with Internet access (Total Canadian Population)	36 (19)	21 (12)	20 (11)
<b>Sex</b>			
Male	42	26	25
Female	28	16	14
<b>Age</b>			
18-24 years	41	14	24
25-34 years	38	21	19
35-44 years	37	24	16
45-54 years	29	21	22
55-64 years	36	22	23
65 years and over	12	21	8
<b>Province</b>			
Atlantic	41	21	17
Quebec	27	24	15
Ontario	36	18	22
Manitoba/Saskatchewan	32	17	17
Alberta	42	22	26
British Columbia	39	26	18
<b>Income</b>			
Low income (\$30K or less)	25	15	18
Average income (\$30-59K)	37	21	16
High income (\$60K or more)	40	24	24
<b>Use</b>			
Have Internet access for <1 year	25	14	11
Have Internet access for 1-3 years	31	18	14
Have Internet access for >3 years	47	29	30
Occasional weekly Internet use (less than 1 hour to 5 hours)	28	17	13
Average weekly Internet use (5 to 10 hours)	50	21	29
High weekly Internet use (more than 10 hours)	54	42	35

Source: The Angus Reid Report, *Canadians' Internet and E-commerce Activities*, July/August 1999.

**Table 6: Forecast economic share of electronic commerce (in \$ millions)**

Country	1999		2004		Inc./dec. %
	N	%	N	%	
Latin America	0.7	0.4%	29.9	0.8%	+100%
Asia Pacific	3.3	1.7%	233	6.1%	+259%
Canada	11.02	5.7%	151.5	4%	-30%
United States	120.5	61.8%	1480	38.6%	-38%
Western Europe	36.6	18.8%	1300	33.9%	+80%
Japan	20.2	10.4%	568	14.8%	+42%
Rest of World	2.7	1.4%	73.3	1.9%	+36%
<b>Total</b>	<b>195.02</b>	<b>100%</b>	<b>3835.7</b>	<b>100%</b>	

**Table 7: Accomplishments subsequent to the Canadian Electronic Commerce Strategy (2000)**

1	<b>Cryptography</b> Policy that allows domestic use of any strength cryptography, with no mandatory key recovery.
2	<b>Consumer protection</b> Voluntary business guidelines to protect consumers conducting online transactions.
3	<b>Privacy</b> Framework legislation governing the protection of personal information.
4	<b>Digital signatures</b> Legal framework for formal recognition of digital signatures and electronic records.
5	<b>Government use</b> Policy framework for the Government of Canada public key infrastructure.
6	<b>Standards</b> Domestic and international electronic commerce standards framework.
7	<b>Taxation</b> Commitment to technology-neutral electronic commerce taxation regime.

Source: Report of the Canadian E-Business Opportunities Roundtable, FAST FORWARD: Accelerating Canada's Leadership in the Internet Economy, January 2000.



**Table 8 : Techniques for meeting the different requirements and needs with respect to electronic signatures**

	Electronic signature	Hash function	Encryption	Certification
Identification	X			
Integrity		X		
Confidentiality			X	
Non-repudiation				X

**Source:** Parisien, S., L'identification et la certification dans le commerce électronique: droit, sécurité, audit et technologies, Ed Yvon Blais Inc, Quebec, Canada, 1996, 141/270 pages.

**Table 9 : Creating and verifying a digital signature**

**Creation**

1 - Begin with an electronic message.
2 - Hash the message.
3 - Take the resulting bytes (the result of the hash) and encrypt it with your secret key.
4 - The result is the signature.

**Verification**

1 - You must have the following information: a) the signed document; b) the public key of the signatory; c) the algorithm used in hashing the document; d) the algorithm used in the asymmetric encryption of the key.
2 - Decrypt the digital signature using this information.
3 - This will provide the original hash result.
4 - Rehash the document.
5 - Compare the two hash values.
6 - If the values are the same you know that the document was signed by the one claiming to be the signatory.

**Source:** Policy Options politiques, *Challenges Posed by Open Network Electronic Commerce*, Vol. 14, No. 5, June 1998, p. 9.

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