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**THE AVAILABILITY OF STATISTICS ON INFORMATION AND
COMMUNICATION TECHNOLOGIES: CANADIAN DATA**

OECD, Paris, 18-19 June 1998

This room document provides data on the Canadian Information and Communication Technology (ICT) sector defined using a list of industries taken from the Canadian 1980 Standard Industrial Classification (SIC). This demonstrates the annual availability of such data in Canada and offers comments on the availability of data not provided. The 1990 SIC based definition is given, as is an equivalent list of industries drawn from the third revision of the International Standard Industrial Classification (ISIC Rev. 3).

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THE AVAILABILITY OF STATISTICS ON INFORMATION AND COMMUNICATION TECHNOLOGIES: CANADIAN DATA

1. INTRODUCTION

This note provides an indication of the availability of data on the Information and Communication Technology (ICT) sector in Canada, using a definition agreed upon by Industry Canada in 1996 and tabled by Statistics Canada at the 1997 meeting of the Ad Hoc Meeting on Indicators for the Information Society. The definition given in DSTI/ICCP/AH(97)2 was based on the Canadian 1980 Standard Industrial Classification (SIC) and it is reproduced in Appendix 1

An outcome of the 1997 Ad Hoc Meeting on Indicators for the Information Society, noted in the Summary Record (DSTI/ICCP/AH/M(97)1), was an agreement by Canada to show that a variety of economic measures could be tabulated for a particular definition of the ICT sector and also to provide a version of the Canadian definition in ISIC Rev. 3. The economic variables suggested in 1997 were given in DSTI/ICCP/AH(97)3. Selected data already produced in 1996 as part of Canadian Working Document, 'Measuring the Global Information Infrastructure for a Global Information Society' (1996), but updated for this note, are given in Appendix 2, and the ISIC Rev. 3 definition follows in Appendix 3.

In the next section, the data provided and their frequency of measurement are compared with the list of economic variables given in DSTI/ICCP/AH(97)3 and some observations are made on the availability of data for those variables not given in Appendix 2.

2. DATA AVAILABILITY

2.1 Annual economic data

Data are available annually for the following variables in the ICT sector. They data may be derived from surveys, from administrative data, or from a combination of both.

Production

1. Operating Revenue
2. Operating Profits
3. Commodity data (Not in Appendix 2, and not collected for all industries)

This information comes from production surveys or from financial surveys.

GDP for each industry

This is estimated as part of the Canadian System of National Accounts (SNA).

Trade

1. Exports
2. Imports
3. Trade Balance

Investment (Not in Appendix 2, but available)

1. Capital Investment
2. Depreciation
3. Capital Stock

There is an annual survey of capital investment by industry. Stock and depreciation are derived from a perpetual inventory method.

Labour

1. Employment
2. Wages and Salaries (Not in Appendix 2, but available)

There are four sources in Canada for employment data: the Survey of Employment, Payroll and Hours (SEPH); the Labour Force Survey (LFS); the production survey; and, the census. The census is quinquennial, the other sources are annual. Each source has its uses. The establishment based SEPH data are appropriate for productivity analysis, the LFS data capture the self-employed, the production survey data should be close to those of SEPH, but more detailed, and the Census data, while quinquennial, provide more detail on individuals than the LFS.

R&D

There is an annual survey of R&D in Canadian industry (RDCI). Data for firms performing less than \$1 million a year of R&D come from administrative sources.

2.2 Data available for intervals greater than a year or occasionally**Labour*****Quinquennial Census (There is some labour force data annually)***

1. Education and specialization by industry
2. Occupation distribution by industry

Occasional Surveys

1. Training expenditures (some information)
2. Innovation
3. Diffusion of technologies

2.3 Date on the use of ICTs – Occasional

- | | | |
|----|---------------------------------|-----------------------------------|
| 1. | Governments | none |
| 2. | Education | some data on computers in schools |
| 3. | Business Enterprise | occasional |
| 4. | Private Non-Profit Institutions | none |
| 5. | Households | occasional, some annual |

3. Data Not Available

Foreign direct investment (FDI) data are not available. Data on incoming and outgoing FDI are being examined with a view to producing such data in the future.

4. Conclusion

The previous sections demonstrate that sufficient data are available in Statistics Canada to provide a basic economic description of the ICT sector and of the use of ICTs by some sectors. The principal weaknesses are in data on the use of ICTs and if the impact of ICTs are to be analysed, more data are needed. However, for this to be done comprehensively, there must be a classification of the products as ICT products, or not. Developing such a classification is an important next step.

REFERENCES

DSTI/ICCP/AH(97)2 The Information and Communication Technology Sector: A Definition, OECD, Paris, 12-13 June 1997.

DSTI/ICCP/AH(97)3 The Availability of Statistics on Information and Communication Technologies, OECD, Paris, 12-13 June 1997.

DSTI/ICCP/AH/M(97)1 Summary Record of the Ad Hoc Meeting on Indicators for the Information Society, OECD, Paris, 12-13 June 1997

Mozes, D., Sciadas, G., and McCarrell, H., Measuring the Global Information Infrastructure for a Global Information Society: Concepts and Performance Indicators, Industry Canada Working Document, Industry Canada, Ottawa, 1996.

Statistics Canada, Standard Industrial Classification: 1980, Catalogue 12-501E, Statistics Canada, Ottawa, 1980.

United Nations, International Standard Industrial Classification of all Economic Activities, Third Revision, Statistical Papers, Series M, No. 4, Rev.3, United Nations, New York, 1990.

APPENDIX 1

Industry Classification

This is taken from ‘Measuring the Global Information Infrastructure for a Global Information Society’.

Industry Classification

Table A sets out the classification structure used in this paper to define the ICT sectors. It is based on the current definitions and classifications contained in the 1980 SIC at the industry class (four digits) for each industry group.

Table A: Industries included in ICT sectors

| SECTOR | SIC | DESCRIPTION |
|-----------------|-------------|--|
| Services | 481_ | Telecommunications Broadcasting Industries |
| | 4811 | Radio Broadcasting Industry |
| | 4812 | Television Broadcasting Industry |
| | 4813 | Combined Radio and Television Broadcasting Industry |
| | 4814 | Cable Television Industry |
| | 482_ | Telecommunication Carriers Industry |
| | 483_ | Other Telecommunication Industry (e.g., paging) |
| | 772_ | Computer and Related Services |
| | 7721 | Computer Services |
| | 7722 | Computer Equipment Maintenance and Repair |
| Goods | 334_ | Record Player, Radio and Television Receiver Industry |
| | 3341 | Record Player, Radio and Television Receiver Industry |
| | 335_ | Communication and Other Electronic Equipment Industries |
| | | Telecommunication Equipment Industry |
| | 3351 | Electronic Parts and Components Industry |
| | 3352 | Other Communication and Electronic Equipment Industries |
| | 3359 | |
| | 336_ | Office, Store and Business Machine Industries |
| | 3361 | Electronic Computing and Peripheral Equipment Industry |
| | 3362 | Electronic Office, Store and Business Machine Industry |
| | 3368 | Store and Business Machine Industry |
| | 3369 | Other Office, Store and Business Machine Industries |
| | 391_ | Scientific and Professional Equipment Industries |
| | 3911 | Indicating, Recording and Controlling Instruments Industry |
| | 3912 | Other Instruments and Related Products Industry |

Data**2.1 Data Sources**

The ICT and the arts and culture sectors are not recognized by existing industrial classifications. As a result, aggregation of individual industries into these sectors poses problems of comparability. In the ICT goods sector, in particular, data for some component industries either are not collected or are available only at higher levels of aggregation. These aggregation problems differ by economic variable studied, depending on the data source. Footnotes to individual tables, when warranted, and the Appendices document in detail these cases. It is expected that the implementation of the NAICS will greatly facilitate the completeness of sectoral data.

The data used in this paper come from a multitude of Statistics Canada databases. Data for the ICT sectors were chosen to maximize comparability between the sectors. Most of these data, which originate in both administrative and data sources, are contained in the following publications: GDP data in *Gross Domestic Product by Industry*, Cat. No. 15-001, published by the Industry Measures and Analysis Division; employment data in *The Labour Force*, Cat. No. 71-001, published by the Household Surveys Division; financial data in *Financial Statistics for Enterprises*, Cat. No. 61-219, published by the Industrial Organization and Finance Division, and *Services Indicators*, Cat. No. 63-016; R&D data in *Industrial Research and Development*, Cat. No. 88-202, published by the Science and Technology Re-design Project; trade data for goods-producing industries by SIC from special tabulations by the International Trade Division and for services in *Canada's International Transactions in Services*, Cat. No. 67-203, published by the Balance of Payments Division.

Data for arts and culture, unless otherwise specified, come from regular surveys carried out by the Education, Culture and Tourism Division. Information can be found in the Division's standard table packages, as well as in its publication *Focus on Culture*, Cat. No. 87-004-XPB.

Classification frameworks are based on the *Standard Industrial Classification, 1980*, Cat. No. 12-501 and the NAICS, available at:
<http://www.statcan.ca/Documents/English/Subjects/Standards/standard.htm>.

2.2 Data Qualifications

Table B lists those industries that have been omitted from the data compilations for certain variables because the data for the industries concerned are aggregated at a higher level, no data are collected for the variable in question or the data are currently under review.

Table B: The ICT industries not included in the performance indicators

| Performance Indicator | | ICT services sector | ICT goods sector |
|-----------------------|--------------------|---------------------|---------------------|
| GDP | | | SIC 391 |
| FINANCIAL | Operating revenues | SIC 483 | SIC 3341, 3368, 391 |
| | Operating profits | SIC 483 | SIC 3341, 3368, 391 |
| | Assets | SIC 483 | SIC 3341, 3368, 391 |
| R&D* | | ** | SIC 341 |
| TRADE | | SIC 481 | |

- * Includes non-ICT goods sector SICs 3913 (clock and watch) and 3914 (ophthalmic goods), with scientific and professional equipment SICs 3911 and 3912. The non-ICT SICs account for a negligible amount of R&D spending.
- ** Broadcasting and Telecommunication services are combined, along with postal and related couriers (SIC 484), and titled as “communications” for the R&D performance indicator.

APPENDIX 2

Data

Selected tables from 'Measuring the Global Information Infrastructure for a Global Information Society' (updated with most recent information).

Note: Tables may not add up due to rounding

Table 1

ICT sectors' GDP

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1990 - 1997 avg annual change (compounded) % | period change |
|--|---------|---------|-------------------------------|---------|---------|---------|---------|---------|--|------------------|
| | | | \$ (millions - 1992 dollars)* | | | | | | | |
| ICT services sector | 17,931 | 18,919 | 19,342 | 20,468 | 22,350 | 24,627 | 26,788 | 29,669 | 7.5 | 65.5 |
| ICT goods sector ¹ | 4,181 | 4,185 | 4,533 | 4,451 | 5,122 | 6,391 | 6,311 | 7,127 | 7.9 | 70.5 |
| Total ICT sectors | 22,112 | 23,104 | 23,875 | 24,919 | 27,472 | 31,018 | 33,099 | 36,796 | 7.5 | 66.4 |
| Total economy | 609,231 | 600,004 | 604,275 | 619,194 | 643,063 | 655,088 | 665,277 | 691,017 | 1.8 | 13.4 |
| ICT sector's share of total economy | 3.6% | 3.9% | 4.0% | 4.0% | 4.3% | 4.7% | 5.0% | 5.3% | | |

Data compilations from Statistics Canada - Cat. Nos. 15-001 and 63-016-XPB

*GDP has recently been rebased with 1992 as its base year. Historical revisions were conducted at the same time, so there might be some considerable differences between the 1986 and 1992 base years.

¹ Excludes scientific and professional equipment (SIC 391)

Table 3
ICT sectors' operating revenues

| | | | | | | | | | | | 1990 - 1997 | |
|----------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------|-------------------|---------------|-------|
| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1997 (compounded) | avg annual change | period change | % |
| | \$(millions) | | | | | | | | | | | |
| ICT services sector ¹ | 25,054 | 28,487 | 30,080 | 32,430 | 36,745 | 40,374 | 44,404 | 39,318 | | 6.6 | | 56.9 |
| ICT goods sector ² | 10,147 | 9,926 | 10,426 | 12,043 | 14,319 | 17,230 | 18,429 | 26,253 | | 14.6 | | 158.7 |
| Total ICT sectors | 35,201 | 38,413 | 40,506 | 44,473 | 51,064 | 57,604 | 62,833 | 65,571 | | 9.3 | | 86.3 |
| Total economy | 1,201,330 | 1,155,015 | 1,129,499 | 1,198,113 | 1,304,448 | 1,401,926 | 1,419,360 | 1,489,741 | | 3.1 | | 24 |

¹ Excludes other telecom, e.g. paging, (SIC 483)

Excludes record player, radio and television industry (SIC 3341); electronic, office store and business machine (OSB) and other OSB industries (SIC 3368); and the scientific and professional equipment industry (SIC 391)

Table 4
ICT sectors' operating profits

| | | | | | | | | | | | 1990 - 1997 | |
|-------------------------------------|--------------|--------|--------|--------|--------|--------|--------|---------|-------------------|-------------------|---------------|-------|
| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1997 (compounded) | avg annual change | period change | % |
| | \$(millions) | | | | | | | | | | | |
| ICT services sector ^{1, 2} | 4,165 | 4,096 | 4,580 | 4,319 | 4,980 | 4,559 | 5,561 | 6,198 | | 5.8 | | 48.8 |
| ICT goods sector ² | 703 | 537 | 432 | 379 | 759 | 877 | 993 | 2,255 | | 18.1 | | 220.8 |
| Total ICT sectors | 4,868 | 4,633 | 5,012 | 4,698 | 5,739 | 5,436 | 6,554 | 8,453 | | 8.2 | | 73.6 |
| Total economy ² | 65,809 | 51,078 | 43,255 | 55,763 | 79,726 | 97,125 | 95,729 | 111,020 | | 7.8 | | 68.7 |

¹ Excludes other telecom, e.g. paging, (SIC 483)

Excludes record player, radio and television industry (SIC 3341); electronic, office store and business machine (OSB) and other OSB industries (SIC 3368); and the scientific and professional equipment industry (SIC 391)

Table 5

ICT sectors assets

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1990 - 1997 | |
|-------------------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|------------------|
| | | | | | | | | | avg annual change (compounded) % | period change |
| | \$ (millions) | | | | | | | | | |
| ICT services sector ^{1, 2} | 46,351 | 49,628 | 53,695 | 56,025 | 61,564 | 67,814 | 70,883 | 67,562 | 5.5 | 45.8 |
| ICT goods sector ² | 13,027 | 13,466 | 15,347 | 16,761 | 16,281 | 16,890 | 17,554 | 23,547 | 8.8 | 80.8 |
| Total ICT goods & services | 59,378 | 63,094 | 69,042 | 72,786 | 77,845 | 84,704 | 88,437 | 91,109 | 6.3 | 53.4 |
| Total economy ² | 1,906,534 | 1,954,768 | 1,998,895 | 2,100,913 | 2,244,701 | 2,387,128 | 2,561,919 | 2,739,370 | 5.3 | 43.7 |

¹ Excludes other telecom, e.g. paging, (SIC 483)

² Excludes record player, radio and television industry (SIC 3341); electronic, office store and business machine (OSB) and other OSB industries (SIC 3368); and the scientific and professional equipment industry (SIC 391)

Table 6

ICT sectors' R&D expenditures

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1990 - 1997 | |
|-------------------------------|---------------|-------|-------|-------|-------|-------|-------|-------|---|------------------|
| | | | | | | | | | avg annual change (compounded) % | period change |
| | \$ (millions) | | | | | | | | | |
| ICT services sector | 402 | 386 | 463 | 586 | 696 | 672 | 697 | 767 | 9.7 | 90.8 |
| ICT goods sector | 1,495 | 1,581 | 1,605 | 1,757 | 2,017 | 2,231 | 2,345 | 2,516 | 7.7 | 68.3 |
| Total ICT goods & services | 1,897 | 1,967 | 2,068 | 2,343 | 2,713 | 2,903 | 3,042 | 3,283 | 8.2 | 73.1 |
| Total Economy | 5,216 | 5,439 | 5,845 | 6,539 | 7,121 | 7,659 | 8,143 | 8,627 | 7.5 | 65.4 |

¹Data refer to intramural R&D expenditures by industries, excluding R&D by governments and educational institutions² Includes postal and related courier industries

² Excludes record player, radio and television industry (SIC 3341); and the scientific and professional equipment industry (SIC 391)

p... preliminary i... intended expenditures

Data compilations from: *Statistics Canada - Cat. No. 88-202*

Table 7
ICT sectors' trade

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1990 - 1997 | | |
|----------------------------|---------------|--------|--------|---------|---------|---------|---------|---------|--------------------------------------|------------------|--|
| | | | | | | | | | avg annual change (compounded) | period change | |
| | \$ (millions) | | | | | | | | | % | |
| ICT services sector | | | | | | | | | | | |
| Exports | 1,726 | 1,877 | 2,022 | 2,407 | 2,612 | 2,756 | 3,097 | | | | |
| Imports | 1,516 | 1,587 | 1,628 | 1,883 | 2,159 | 2,381 | 2,532 | | | | |
| Balance | 210 | 290 | 394 | 524 | 453 | 375 | 565 | | | | |
| ICT goods sector | | | | | | | | | | | |
| Exports | 9,617 | 10,461 | 11,579 | 12,434 | 16,058 | 19,531 | 20,626 | 22,655 | 13.0 | 135.6 | |
| Imports | 18,215 | 19,173 | 21,573 | 24,654 | 30,474 | 35,565 | 36,466 | 41,361 | 12.4 | 127.1 | |
| Balance | -8,598 | -8,712 | -9,994 | -12,220 | -14,416 | -16,034 | -15,840 | -18,706 | | | |
| Total ICT goods & services | | | | | | | | | | | |
| Exports | 11,343 | 12,338 | 13,601 | 14,841 | 18,670 | 22,287 | 23,723 | | | | |
| Imports | 19,731 | 20,760 | 23,201 | 26,537 | 32,633 | 37,946 | 38,998 | | | | |
| Balance | -8,388 | -8,422 | -9,600 | -11,696 | -13,963 | -15,659 | -15,275 | | | | |

Table 30
Household equipment penetration rates

| | 1990 | 1995 | 1996 | 1997 |
|-------------------|------|------|------|------|
| | % | % | % | % |
| Telephone | 98.5 | 98.5 | 98.7 | 98.6 |
| Colour Television | 96.9 | 98.5 | 98.5 | 98.7 |
| Radio | 99.1 | 98.9 | 98.7 | 98.7 |
| Cable | 71.4 | 73.4 | 74.0 | 73.7 |
| VCR | 66.2 | 82.1 | 83.5 | 84.7 |
| Camcorder | 5.6 | 14.9 | 16.1 | 17.7 |
| Tape Recorder | 67.5 | 78.8 | 80.4 | 82.0 |
| CD Player | 15.5 | 47.4 | 53.4 | 58.1 |
| Computer | 16.2 | 28.8 | 31.6 | 36.0 |
| Modem | 8.4 | 12.1 | 15.5 | 21.5 |

Table 31
Penetration rates and income

| Income Quartiles | Bottom | Second | Third | Top | All |
|------------------|---------------|---------------------|--------------------|--------------|------|
| | Under \$21815 | \$21,815 - \$40,442 | \$40,442 - \$65502 | Over \$65502 | |
| | % | % | % | % | % |
| Telephone | 96.2 | 98.8 | 99.7 | 99.8 | 98.6 |
| Cable | 65.3 | 71.3 | 76.6 | 81.8 | 73.7 |
| Computer | 16.7 | 26.2 | 41.0 | 60.0 | 36.0 |
| Modem | 9.0 | 14.6 | 23.3 | 39.1 | 21.5 |

APPENDIX 3

Canadian definition of ICT industries on an ISIC Rev. 3 basis

The groupings below provide suggested definitions of ICT goods industries and ICT service industries in terms of ISIC classes. These groupings provide definitions that are as close as possible in scope to the Canadian definitions.

ICT goods industries

- 3000 Manufacture of office, accounting and computing machinery
- 3210 Manufacture of electronic valves and tubes and other electronic components
- 3220 Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
- 3230 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
- 3312 Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
- 3313 Manufacture of industrial process control equipment

ICT service industries

- 6420 Telecommunications
- 7210 Hardware consultancy
- 7220 Software consultancy and supply
- 7230 Data processing
- 7240 Data base activities

Maintenance and repair of office, accounting and computing machinery

- 7290 Other computer related activities
- 9213 Radio and television activities