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Information and Communications Technologies (ICT)



Defining the Information and Communications Technologies Sector

Information and Communications Technologies Statistical Overview

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Defining the Information and Communication Technology Sector

Adoption of the OECD definition and introducing the North American Industry Classification System

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Defining the Information and Communication Technology (ICT) Sector

Introduction

Two recent events, the adoption by the OECD of a definition for the ICT sector and the adoption by the NAFTA countries of the new North American Industry Classification System (NAICS), will have a considerable impact on the statistics produced to describe this important sector of the economy. The purpose of this paper is to:

- describe the context in which the definition of this sector has evolved;
- present the latest international definition and the equivalent definitions in terms of national standards; and
- present the plans for implementation of NAICS in Canada, in particular for those surveys of interest for tracking the ICT sector.

The context in which the definition of the ICT sector has evolved

For a number of years, policy makers and analysts in Canada and around the world have expressed an interest in understanding and measuring the importance of the so-called "ICT sector". In the absence of a standard definition for the ICT sector, it has been very difficult to monitor its development, to make international comparisons and to develop policies.

In an effort to stimulate discussions on this issue, Statistics Canada and Industry Canada published a working document entitled "Measuring the Global Information Infrastructure for a Global Information Society" in June 1996. The main thrust of this working document was to propose a definition for the ICT sector in terms of the existing Canadian Standard Industrial Classification (CSIC) and to present a statistical profile of the Canadian ICT sector. The proposed definition was based on the notion that the ICT sector should include industries "primarily engaged in producing goods or services, or supplying technologies, used to process, transmit or receive information". After some deliberation, the proposed Canadian industries were as follows:

Industry groupings	SIC	Industry titles
<i>Service industries</i>	4810	Telecommunication Broadcasting Industries
	4820	Telecommunication Carriers Industry
	4830	Other Telecommunication Industries
	7720	Computer and Related Services
<i>Good Industries</i>	3340	Record Player, Radio and Television Receiver Industry
	3350	Communication and Other Electronic Equipment Industries
	3360	Office, Store and Business Machine Industries
	3911	Indicating, Recording and Controlling Instruments Industry
	3912	Other Instruments and Related Products Industry

For the first time, a standard list of industries was adopted to describe the ICT sector and Industry Canada prepared and published a statistical review of the ICT sector based on this definition.

Discussions continued at the OECD, and the Committee for Information, Computer and Communications Policy (ICCP) established an Ad Hoc Statistical Panel to address the issue of indicators for the information society. More specifically, the Panel was to develop definitions which would support the development of these indicators. The task set at the first meeting of the Panel in 1997 was agreement on a definition of the ICT sector, based on a list of industries drawn from the third revision of the International Standard Industrial Classification (ISIC, rev.3). This objective was realized at the June 1998 meeting of the Panel and the resulting definition was released by the OECD in September, 1998.

The OECD definition

The panel has agreed to the following definition:

Industry groupings	ISIC	Industry titles
<i>Manufacturing</i>	3000	Manufacture of office, accounting and computing machinery
	3130	Manufacture of insulated wire and cable
	3210	Manufacture of electronic valves and tubes and other electronic components
	3220	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
	3229	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
	3311	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
<i>Goods related services</i>	5150	Wholesale of machinery, equipment and supplies
	7123	Renting of office machinery and equipment (including computers)
<i>Intangible services</i>	6420	Telecommunications
	7200	Computer and Related Activities

Although the OECD definition of the ICT sector differs somewhat from the definition that was used in Canada, the underlying principle is very similar. In this case, the products of a candidate **manufacturing** industry must:

- be intended to fulfill the function of information processing and communication, including transmission and display; or
- use electronic processing to detect, measure and/or record physical phenomena, or to control a physical process.

Components primarily intended for use in such products are also included. The products of a candidate **service** industry must:

- be intended to enable the function of information processing and communication by electronic means; and,
- the service provided must go beyond simply the supply of goods.

More detail on this definition can be found in the OECD document DSTI/ICCP/AH/M(98)1. The main differences between the OECD definition and the definition previously used in Canada are:

- The exclusion of radio and television broadcasting;
- The inclusion of manufacturers of insulated wire and cable;
- The inclusion of wholesalers and lessors of ICT equipment.

Defining the ICT Sector in terms of national standards

The purpose of the OECD definition is to provide a framework to compile statistics that are comparable from country to country. Given that ISIC is not used in North America¹, it is necessary to develop a list of industries in terms of the national standard that is as close as possible in scope to the ISIC based definition.

The industry standard currently in use in Canada is the 1980 Canadian Standard Industrial Classification (1980 SIC). Existing Canadian ICT statistics are produced on the basis of this standard. However, the 1980 SIC will be gradually replaced by the new North American Industry Classification System (NAICS)².

During this transition period, there will be a need for definitions to be expressed in terms of both national standards. These definitions are outlined below:

1980 SIC based definition

Manufacturing	3341	Record Players, Radio & TV Receivers Ind
	3351	Telecommunication Equipment Industry
	3352	Electronic Parts and Components Industry
	3359	Other Electronic Equipment Industries
	3361	Electronic Computers & Peripheral Equip.
	3362	Electronic Office, Store & Business Machine Industry
	3369	Other Office, Store & Business Machine Industries
	3381	Communications & Energy Wire & Cable Ind
	3911	Indicating & Recording Instruments Ind.
	3912	Other Instruments and Related Products
Goods related services	5743	Elec Mach, Equip & Supp (exc Comp), Whlse
	5744	Computer & Related Mach, Equip & Software, Whlse
	5791	Office & Store Mach, Equip & Supp, Whlse
	9913	Office Furniture & Mach Rental & Leasing
Intangible Services	4814	Cable Television Industry
	4821	Telecommunication Carriers Industry
	4839	Other Telecommunication Industries

¹ Most developed countries use a national classification to describe their economy. ISIC provides a bridge between various national classifications.

² The Canadian version of NAICS was published in March 1998 (cat. 12-501-XPE). It is known as NAICS Canada 1997.

7721	Computer Services
7722	Computer Equipment Maintenance & Repair

The main differences between this definition and the previously used 1980 SIC based definition are:

- The inclusion of SIC categories **3381** - Communications & Energy Wire & Cable Ind, **5743** - Elec Mach, Equip & Supp (exc Comp), Whlse, **5744** - Computer & Related Mach, Equip & Software, Whlse, **5791** - Office & Store Mach, Equip & Supp, Whlse, and **9913** - Office Furniture & Mach Rental & Leasing.
- The exclusion of SIC categories **4811** - Radio Broadcasting, **4812** - Television Broadcasting and **4813** - Combined Radio and Television Broadcasting.

NAICS based definition

Manufacturing	33331	<u>Commercial and Service Industry Machine Manufacturing³</u>
	33411	Computer and Peripheral Equipment Manufacturing
	33421	Telephone Apparatus Manufacturing
	33422	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
	33431	Audio and Video Equipment Manufacturing
Goods Related Services	33441	Semiconductor and Other Electronic Component Manufacturing
	33451	<u>Navigational, Measuring, Medical and Controlling Devices Manufacturing³</u>
	33592	Communication and Energy Wire and Cable Manufacturing
	41731	Computer, Computer Peripheral and Pre-Packaged Software Wholesaler-Distributors
	41732	Electronic Components, Navigational and Communications Equipment and Supplies Wholesaler-Distributors
Intangible Services	41791	Office and Store Machinery and Equipment Wholesaler-Distributors
	53242	Office Machinery and Equipment Rental Leasing
	51121	Software Publishers
	51322	Cable and Other Program Distributors
	51331	Wired Telecommunications Carriers
	51332	Wireless Telecommunications Carriers (except Satellite)
	51333	Telecommunications Resellers
	51334	Satellite Telecommunications
	51339	Other Telecommunications
	51419	Other Information Services
	51421	Data Processing Services
	54151	Computer Systems Design and Related Services
	81121	<u>Electronic and Precision Equipment Repair and Maintenance³</u>

The above definitions were developed using the following process:

- First a concordance between ISIC classes and the national standards were developed on the basis of Statistics Canada Standards Division's activity description data base;
- Second, the "immaterial" links between the national classifications and those particular ISIC classes were eliminated. This exercise is somewhat subjective, but necessary, given the relatively large number of partial links between the classification systems. The final result is a list that does not include parts of industries, so that it is possible to compile statistics on the basis of the proposed definition.

³ Contain a significant non-ICT components.

NAICS implementation plan

The North American Industry Classification System will be gradually introduced into Statistics Canada's survey program. The following table outlines the plans, as they currently stand, for the surveys most relevant to those interested in the ICT sector.

Survey	Reference period	Level of detail	Availability
Annuaux			
Annual Survey of Manufacturers	1997	6 digit	2 nd quarter 2000
Wholesaling and Retailing in Canada (Annuaux)	1997	3 digit	2 nd quarter 2000
Annual Survey of Telecommunications Service Providers	1997	6 digit	2 nd quarter 2000
Cable Television and Other Program Distribution	1997	6 digit	1 st quarter 1999
Annual Survey of Computer Services	1997	5 digit	2 nd quarter 2000
Annual Survey of Consumer Goods Rental	1997	5 digit	2 nd quarter 2000
Annual Estimates of Employment, Earnings and Hours	2001	4 digit	2 nd quarter 2002
Industrial Research and Development – Intentions	2000	6 digit	4 th quarter 2000
Capital expenditures	1997	4 or 5 digits	3 rd quarter 1999
National Input-Output Accounts	1992-1997	unknown	2 nd quarter 2000
Provincial GDP by industry	1992-1999	unknown	4 th quarter 2001
Provincial Input-Output Accounts	1997	unknown	3 rd quarter 2000
Sub-Annuaux			
Gross Domestic Product by Industry (Monthly)	01/1992 to 09/2000	3 digit	2 nd quarter 2000
Labour force information	Jan 1999	4 digit	1 st quarter 1999
Quarterly Financial Statistics for Enterprises	1 st Q 1999	3 or 4 digit	2 nd quarter 1999
Employment, Earnings and Hours	Jan 2001	3 digit	1 st quarter 2001
Quarterly Survey of Telecommunications Service Providers	1 st Q 1999	51331 51332	3 rd quarter 1999

The impact of introducing NAICS

The introduction of a new classification system is typically accompanied by a break in time series. The transition from the 1980 CSIC to NAICS is no exception. In the case of ICT industries, however, the coverage at the aggregate level (i.e. ICT sector) is similar, whether expressed in terms of the 1980 SIC or NAICS. The new classification has the advantage of recognizing new industries⁴, especially in computer services and telecommunications industries, two fast growth areas. As well, with a few exceptions, it is possible to define the ICT sector in terms of 4-digit NAICS, thereby reducing the negative impact of different programs producing statistics at different levels of the classification.

⁴ For example wireless telecommunications and software publishing, two industries that did not exist at the time the 1980 SIC was designed.

Annex

Concordance between ISIC rev.3 and the 1980 Canadian Standard Industrial Classification and the North American Industry Classification System

ICT SECTOR - CONCORDANCE FOR REPORTING PURPOSES - 1980 SIC

ISIC3	ISIC title	SIC80	Canadian 1980 SIC title
3000	Manufacture of office, accounting and computing machinery	3361	Electronic Computers & Peripheral Equip.
		3361	Electronic Office, Store & Business Machine Industry
		3368	Other Office, Store & Business Machine Industries
3130	Manufacture of insulated wire and cable	3381	Communications & Energy Wire & Cable Ind
3209	Manufacture of electronic valves ant tubes and other electronic components	3352	Electronic Parts and Components Industry
3219	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	3351	Telecommunication Equipment Industry
		3358	Other Electronic Equipment Industries
3229	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	3341	Record Players, Radio & TV Receivers Ind
3311	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	3911	Indicating & Recording Instruments Ind.
3313	Manufacture of industrial process control equipment	3912	Other Instruments and Related Products
5150	Wholesale of machinery, equipment and supplies	5743	Elec Mach, Equip & Supp (exc Comp), Whlse
		5743	Computer & Related Mach, Equip & Software, Whlse
		5790	Office & Store Mach, Equip & Supp, Whlse
6420	Telecommunications	4814	Cable Television Industry
		4820	Telecommunication Carriers Industry
		4838	Other Telecommunication Industries
7122	Renting of office machinery and equipment (including computers)	9913	Office Furniture & Mach Rental & Leasing
7200	Computer and related activities	7721	Computer Services
		7721	Computer Equipment Maintenance & Repair

ICT SECTOR - CONCORDANCE FOR REPORTING PURPOSES - ISIC to NAICS

ISIC3	ISIC title	NAICS	NAICS titles
3000	Manufacture of office, accounting and computing machinery	33331	Commercial and Service Industry Machinery Manufacturing
		33411	Computer and Peripheral Equipment Manufacturing
3130	Manufacture of insulated wire and cable	33592	Communication and Energy Wire and Cable Industry
3210	Manufacture of electronic valves and tubes and other electronic components	33441	Semiconductor and Other Electronic Component Industry
3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	33421	Telephone Apparatus Manufacturing
		33422	Radio and TV Broadcasting and Wireless Communication Equipment Manufacturing
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	33431	Audio and Video Equipment Manufacturing
3312	Manufacture of instruments and appliances for measuring, Instruments checking, testing, navigating and other purposes, except industrial process control equipment	33451	Navigational, Measuring and Control Manufacturing
3312	Manufacture of industrial process control equipment		
5150	Wholesale of machinery, equipment and supplies	41731	Computer, Computer Peripheral and Pre-Packaged Software Wholesaler-Distributors
		41732	Electronic Components, Navigational and Communications Equipment and Supplies, Wholesaler-Distributors
		41791	Office and Store Machinery & Equipment, Wholesaler-Distributors
6420	Telecommunications	51322	Cable and Other Program Distribution
		51331	Wired Telecommunications Carriers
		51332	Wireless Telecommunications Carriers (except Satellite)
		51333	Telecommunications Resellers
		51334	Satellite Telecommunications
		51339	Other Telecommunications
7123	Renting of office machinery and equipment (including computers)	53242	Office Machinery and Equipment Rental & Leasing
7200	Computer and related activities	51121	Software Publishers
		51419	Other Information Services
		51421	Data Processing
		54151	Computer Systems Design and Related Services
		81121	Electronic and Precision Equipment Repair and Maintenance

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