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Reviewing the ICT sector definition: issues for discussion

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REVIEWING THE ICT SECTOR DEFINITION:

ISSUES FOR DISCUSSION

I. Introduction

1. In 1998 the OECD adopted an activity-based definition of ICT sector. The agreement to a definition based on an international standard classification (ISIC Rev.3) at that meeting was in recognition of the need to obtain some initial measurement of ICT sector core indicators in a very short time frame. It was recognised at that time that it would be necessary to reconsider the definition and review it in the light of subsequent experience.

2. The paper raises some issues for discussion in the light of:

- more experience and knowledge in Member countries as a result of their collection activities;
- the results from the first pilot OECD collection of ICT sector statistics;
- a review of the ICT sector definition by the Nordic countries, presented at the 2000 WPIIS (Working Party on Indicators for the Information Society) meeting;
- an analysis of specialisation ratios for the production of ICT goods and services by firms within the ICT sector industries, based on Australian data.

II. The OECD ICT sector definition approved in 1998

3. In 1998 the OECD recognised that the ICT sector ought to be defined as an industrial sector. Thus it should be formed by bringing together business units (establishments, enterprises or enterprise groups) that had common ICT activities. It was felt that the industrial classification ISIC rev 3 was the best option available to collect indicators on an internationally comparable basis, even though it did not precisely identify all the activities that could be considered to be ICT activities¹. The list of ICT activities was decided on the basis of a set of principles, as shown in Box 1.

4. The meeting also recognised that the preferred way of identifying an ICT sector would have been to firstly define ICT goods and services, and then to formulate the ISIC classes that had activities (manufacturing, wholesaling etc) involving those goods and services. In order to obtain a initial set of indicators for the ICT sector in a limited amount of time, though, the approach taken was to first define the activities, and subsequently work on a list of ICT goods and services that could complement and help to refine the activity-based definition.

5. At the 1998 meeting, it was also argued that the inclusion of whole ISIC classes in the definition was too restrictive and would have meant that the definition would not be as pure as users would like – in statistical terms, the specialisation ratios would not be as high as desired. Thus it was proposed that the

1. None of the alternative industrial classifications was particularly suited to define ICT activities, although the North American Industrial Classification (NAICS) was moving in the preferred direction in that it did bring together both manufacturing and service sector industry classes into the one “Information sector”.

ICT sector should be defined by forming sub-classes in certain industries where the activities related to a mixture of ICT and non-ICT goods and services. The group decided not to accept this proposal, except in the case of the Wholesale sector, where the industrial class 5150 was seen to be too broad and covered much more than ICT activities.

Box 1 - The OECD ICT sector definition approved in 1998

The principles underlying the choice of the activities included in the ICT sector definition:

For manufacturing industries, the products of a candidate industry:

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

For services industries, the products of a candidate industry:

- must be intended to enable the function of information processing and communication by electronic means.

The ISIC industries included in the ICT Sector:

Manufacturing:

- 3000: Office, accounting and computing machinery
- 3130: Insulated wire cable
- 3210: Electronic valves and tubes and other electronic components
- 3220: Television and radio transmitters and apparatus for line telephony and line telegraphy
- 3230: Television and radio receivers, sound or video recording or reproducing apparatus and associated goods
- 3312: Instruments and appliances for measuring, checking, testing, navigating and other purposes except industrial process equipment
- 3313: Industrial process equipment

Services:

- 5150: Wholesale of machinery, equipment and supplies (part only, where possible)
- 6420: Telecommunications
- 7123: Renting of office machinery and equipment (incl computers)
- 72: Computer related activities

Source: OECD (1998), DSTI/ICCP/AH/M(98)1/REV1

6. Finally, because very few retailers exclusively sell ICT products, it was agreed to postpone the inclusion of 5233 (other retail trade of new goods in speciality stores) until a commodity definition was available. Although delegates agreed to this, it was noted that in the North American Industry Classification System (NAICS), the distinction between wholesale and retail trade was blurring, reducing the rationale for including wholesale while excluding retail.

III. The ICT Sector Data Collection: lessons learnt

7. As a result of the combined efforts of OECD Secretariat (who benefited from a voluntary contribution provided by the US National Science Foundation) and the Statistical Agencies in Member countries, the OECD was able to produce the first edition of “Measuring the ICT Sector” in October 2000. A number of points arose as a result of this work that should be considered as part of the review of the ICT Sector definition, the main points being:

- a) there was a great deal of variation in the treatment of the Wholesale sector in Member countries. Some countries, such as Australia, used a part class procedure in which data was compiled about ICT specialist businesses. A number of other countries, notably the Nordic group, UK, Canada and US tried to develop a refined wholesale sector in a slightly different way. A further group including Japan, Korea, Mexico, Netherlands have excluded the Wholesale sector completely while another group including Austria, Czech Republic, Germany, Hungary and Portugal have included the whole of 5150.
- b) More than half the countries excluded completely ISIC class 7123 – Renting of Office machinery and equipment.
- c) Just under half the countries could not provide data about ISIC 6420 – Telecommunications. In these cases, data about the Telecommunications industry was taken from the OECD Telecommunications database, which is mainly derived from the published reports of major Telecommunications providers.

IV. The Nordic Country Review of the ICT sector definition

8. The Nordic countries conducted a review of the industrial classes included in the ICT sector prior to their collection activities in 2000. Their findings were presented at the 2000 meeting of WPIIS [see DSTI/ICCP/IIS(2000)4 and Appendix A] and are summarised below for convenience:

- a) ISIC 3130 had been included in the ICT sector definition because it contained optical cables, which were considered critical for IT and telecommunications. However, the Nordic group recognised that ICT goods only represented a minor part of the activity of 3130 (less than 20% in Finland and approx. 25% in Sweden) and hence should logically be excluded from the sector definition – with data about optical cables being compiled as part of a commodity definition.
- b) ISIC 5150 was refined using NACE, – i.e .NACE 5143 – Wholesale of electrical household appliances and radio and television goods, 5164 – Wholesale of office machinery and equipment, and NACE 5165 – Wholesale of other machinery for use in industry, trade and navigation. Even within these classes, there are both ICT and non-ICT products included. In the case of NACE 5143, the paper reported that the share of non-ICT goods was about one third in Denmark and Finland and even higher in Norway. In relation to NACE 5164, it was recognised that this included office furniture which should be out of scope of the ICT sector. However this was a small part of the overall industry. Concerning NACE 5165, the conclusion was that the classification was too broad and included significantly more than “telecommunications equipment” which was considered to be the only ICT sector product included in this class.
- c) The detailed NACE classes do not sufficiently identify ICT retail trade although Finland does have a sub-classification that covers the retail sale of computers and telecommunications

equipment which is much closer to what is required. That paper recognised that more work is needed before the relevant Retail activity could be included in the definition.

V. A Study of Specialisation Ratios in Australia

9. Appendix B to this paper provides a detailed study of the specialisation ratios for each of the classes within the current ICT sector definition based on Australian data for 1998-99. This information should be used to review both the list of current inclusions within the definition and the importance of having split classes if the definition is to closely relate to the industry about which users require data.

10. The key findings from the Australian study are that:

- a) the specialisation ratios for ISIC classes 3000, 3220, 3312, 6420 and 72 are all likely to be well over 50% and so the industrial classes should be included within the ICT sector.
- b) The specialisation ratio for ISIC 3130 would be only about 25% and so the class ought to be excluded from the ICT sector.
- c) The specialisation ratio for 3210 and 3230 cannot be derived separately from Australian data. It is likely that the combined classes will have a specialisation ratio of less than 50%.
- d) ISIC class 3313 does not really exist in the Australian classification, therefore no inferences can be drawn.
- e) ISIC class 5150 is likely to have a specialisation ratio of about 40%, as a consequence it should be excluded unless it can be broken down in subclasses (see the 2002 revision of ISIC).
- f) ISIC class 7123 has a specialisation ratio of about 1% and should therefore be excluded from the ICT sector definition.
- g) ISIC class 6420 and group 72 have very high specialisation ratios of approximately 100% and should be included in the ICT sector.

VI. Mapping NAICS to the ICT classes based on ISIC Rev.3: the U.S. experience.

11. Since the U.S. NAICS classification is more detailed and allows more precision than ISIC Rev.3, following the ISIC-based OECD definition would result in an overstatement of the size of U.S. ICT sector. The data provided by the U.S. Census Bureau to the OECD for its 2000 ICT sector publication included those NAICS categories corresponding to the ICT ISIC classes that were considered to be significant, and contained primarily ICT content. Only exception was the ISIC Rev.3 class 7123, that was included in its entirety. Appendix C to this paper provides the NAICS classes used by the U.S. Census Bureau to provide data to the OECD. U.S. comments on the inclusion/exclusion of the classes listed in the OECD ICT sector definition can be summarised as follows²:

- a) Along with the Nordic countries and Australia, the U.S. finds that Fiber optic cable represented a low share (only 16% for the U.S. in 1999) of the value of product shipments of ISIC 3130. However, the U.S. provided an example of the products that would correspond to

2. Based on the comments sent by the U.S. delegation on August 2, 2001.

ISIC class 3130 and the value of their corresponding shipments. According to this product-based definition, about 60% of the wire and cable in the U.S. can be linked to ICT. Class 3130 should therefore be retained.

- b) Class 3210 should be included. While it is impossible to determine the final application (ICT or non-ICT) for transistors, diodes, capacitors, resistors, integrated circuits, etc., because of the high tech manufacturing processes used in the production of semiconductors and related devices, these fit in an ICT grouping. The US excluded capacitors, resistors, and similar devices used in power transmission from the ICT data numbers provided (see the excluded 335999 link in the table in Annex C).
- c) Class 3230 should be included. The US only included data for Audio and Video Equipment Manufacturing. The other various components shown in the mapping in Annex C either were not ICT products or were not separately available in the data and represented only a small portion of the industries linked.
- d) Class 3313 should be excluded. When providing data for this class, the U.S. used “Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables (334513)”. This NAICS industry contains measuring and process control instruments and devices. While many of these are technologically advanced or intricate devices, they may not belong in an information and communications technology grouping. These are providing information about what is going on in an industrial process (temperature, humidity, viscosity, etc.) but are essentially production machines, not information or communication processors or networks.

VII. Issues For Discussion

12. This paper reviews the experience gained with the first ICT data collection, the feasibility study conducted by the Nordic countries last year, and presents an Australian case study of specialisation ratios. Other countries will be able to report and are invited to share their experience at the 2001 WPIIS meeting, or carry out similar analysis in the near future. On the basis of the above discussions, it is now possible to bring forward a range of issues that might be the subject of consideration and discussion at the 2001 WPIIS meeting. These are:

- a) In the light of the above experience do some of the industries included in the ICT sector definition need to be excluded? If yes, does this require a modification of the principles agreed to in 1998?
- b) Should the agreement to only include the whole of ISIC classes in the ICT sector be reviewed? If there is agreement at the meeting to a definition of ICT goods and services, does this impact the specific classes to be included? If so, in what way?

13. In terms of the specific classes that are included in the current definition, delegates are invited to discuss the following:

– both the Nordic countries and Australian case studies indicate that class 3130 (Insulated wire and cable) has a low ICT specialisation ratio. The U.S. presents a product-based classification corresponding to ISIC 3130 and argues for the inclusion of this class. Should this class be excluded and data about optical cables being compiled as part of a commodity definition?

- should class 5150 (Wholesale of machinery, equipment and supplies) be split, in line with the proposed changes to ISIC 2002?
- the Australian experience shows that the industry class 7123 has a very low specialisation ratio. Do other countries have a similar experience? Should this class be excluded from the definition or should further data be obtained before considering its exclusion?
- Should further case studies to review the inclusion/exclusion of ISIC classes 3210, 3230 and 3313 in the ICT sector be compiled?
- Should further investigatory work be undertaken with a view to better defining a set of retail activities and classes that might be included within the ICT sector definition?

**APPENDIX A - THE NORDIC COUNTRIES' EXPERIENCE IN MEASURING THE ICT
WHOLESALE ACTIVITY USING THE NACE CLASSIFICATION³**

14. In **NACE 5143 Wholesale of electrical household appliances and radio and television goods**, all Nordic countries except Iceland have different more detailed national classifications. These four countries (Denmark, Finland, Norway, Sweden) have special classifications for *Wholesale of radio and television goods*, as well as *Wholesale of electrical household appliances*. Three countries (Denmark, Norway and Sweden) have a classification for *Wholesale of gramophone records, tapes, CDs and video tapes*. This indicates that there are good possibilities for a common Nordic application where activities in Wholesale of electrical household appliances could be excluded from the ICT sector activities. Almost one third of the total turnover of NACE 5143 is out of products for ICT sector in Denmark and Finland, the proportion being even higher in Norway.

5143 Wholesale of electrical household appliances and radio and television goods			
DK 1997 Employment (f.t.e) 3.624 Turnover DKK mill.: 23.120	FI 1997 Employment 1.650 Turnover FIM mill.: 7.295	NO 1997 Employment 3.136 Turnover NOK mill.: 16.492	SE 1997 Employment 9.852 Turnover SEK mill.: 38.713
Wholesale of radio and television goods Employment 41% Turnover 51%	Wholesale of radio and television goods Employment 64% Turnover 71%	Wholesale of radio and television goods Employment 26% Turnover 24%	Wholesale of radio and television goods Employment 14% Turnover 22%
Wholesale of electrical household appliances Employment 15% Turnover 9%	Wholesale of electrical household appliances Employment 36% Turnover 29%	Wholesale of electrical household appliances Employment 35% Turnover 44%	Wholesale of household appliances Employment 9% Turnover 12%
Wholesale of gramophone records, recorded and unrecorded videos Employment 17% Turnover 14%		Wholesale of gramophone records, recorded and unrecorded videos Employment 14% Turnover 12%	Wholesale of gramophone records, tapes, CDs and video tapes Employment 10% Turnover 10%
Wholesale of white goods Employment 27% Turnover 26%		Wholesale, lightning equipment Employment 25% Turnover 20%	Wholesale of electrical and lightning equipment Employment 68% Turnover 56%

15. In **NACE 5164 Wholesale of office machinery and equipment** three countries (Denmark, Finland and Iceland) have national breakdowns of NACE. Depending on further analysis of the contents of the national classifications, it might be possible to make a Nordic definition leaving out office furniture, thus restricting ICT-related activities to Wholesale of office machinery, computers and equipment. Though the economic importance of office furniture is minor, in principle, it shouldn't be included in the definition.

3. This results were presented by Lea Parjo (Statistics Finland) at the WPIIS April 2000 meeting [DSTI/ICCP/IIS(2000)4]

5164 Wholesale of office machinery and equipment					
DK 1997		FI 1997		ICE 1998	
Employment (f.t.e.)	17.438	Employment	9.394	Employment	N.A.
Turnover DKK mill.	48.840	Turnover FIM mill.:	21.004	Turnover ISK mill.	3.582
Wholesale of office machinery, computers and equipment		Wholesale of computer hardware		Wholesale of computers, typewriters etc.	
Employment	90%	Employment	78%	Employment	N.A.
Turnover	94%	Turnover	84%	Turnover	97%
Wholesale of office furniture and office supplies		Wholesale of office machinery		Wholesale of office equipment	
Employment	10%	Employment	16%	Employment	N.A.
Turnover	6%	Turnover	13%	Turnover	3%
		Wholesale of office furniture			
		Employment	5%		
		Turnover	3%		

16. In **NACE 5165 Wholesale of other machinery for use in industry, trade and navigation** all Nordic countries have national extensions. Several classifications are strongly related to the structure of the national industry (the fishing industry in Iceland and Norway, the telecommunications industry in Finland and Sweden). Suggestions for breakdown of NACE as well as a possible Nordic definition relating to the ICT sector will depend on further clarifications and analyses. An example of the need for further clarification could be that in Denmark, wholesale of telephones and telefax machines are placed in 5164. It's evident, however, that something must be done. Only telecommunications is relevant to the ICT-sector, meaning 15% of turnover in NACE 5165 in Finland and 42% in Sweden.

5165 Wholesale of other machinery for use in industry, trade and navigation					
DK 1997		FI 1997		ICE 1998	
Employment :	17.807	Employment :	14.474	Employment::	NA
Turnover : DKK m ill.	38.630	Turnover :FIM mill.	27.895	Turnover: ISK mill.	31.146
				NO 1997	SE 1997
				Employment : 14.369	Employment : 24.639
				Turnover: NOK mill.	Turnover : SEK mill.
				40.703	71.132
Wholesale of electrical materials		Wholesale of electrical equipment and supplies		Wholesale of fishing gear and fish-processing industry	
Employment	15%	Employment	21%	Employment	NA
Turnover	15%	Turnover	23%	Turnover	22%
Wholesale of electrical materials		Wholesale of machinery/equipment for power production		Wholesale of measuring and precision instruments	
Employment	15%	Employment	24%	Employment	9%
Turnover	15%	Turnover	27%	Turnover	7%
Wholesale of electronic components		Wholesale of telecommunication equipment and electronic components		Wholesale of equipment for ships and fishing gear	
Employment	29%	Employment	19%	Employment	13%
Turnover	34%	Turnover	15%	Turnover	16%
Wholesale of electronic components		Wholesale of other machinery for use in industry, trade and navigation		Wholesale of computerised materials handling equipment	
Employment	29%	Employment	NA	Employment	3%
Turnover	34%	Turnover	78%	Turnover	1%
Wholesale of other machinery, equipment and accessories		Wholesale of machinery for industry, trade and navigation		Wholesale of telecommunication equipment and electronic components	
Employment	56%	Employment	60%	Employment	29%
Turnover	51%	Turnover	62%	Turnover	42%
Wholesale of other machinery, equipment and accessories		Wholesale of machinery/equipment for oil, gas, quarrying		Wholesale of telecommunication equipment and electronic components	
Employment	56%	Employment	26%	Employment	29%
Turnover	51%	Turnover	24%	Turnover	42%
Wholesale of other machinery, equipment and accessories		Wholesale of machinery/equipment for trade, transport and services		Wholesale of machinery/equipment for trade, transport and services	
Employment	56%	Employment	37%	Employment	59%
Turnover	51%	Turnover	33%	Turnover	50%

ANNEX B - AN ASSESSMENT OF THE ICT SECTOR DEFINITION BASED ON AUSTRALIAN DATA

17. One way of assessing the suitability of the ICT sector definition is to consider the commodity composition of the outputs of the industries included in the definition. While it is not possible to do this perfectly without a precise commodity based definition of ICT goods and services, it is possible to draw some fairly broad conclusions based on our general understanding of which commodities ought to be considered to be ICT goods and services. In fact, it was on this basis that the current industrial definition was made.

18. Australia is one country that has in place a collection methodology that allows the compilation of both industry and commodity data for specific industries. It should be noted that the Australian data is based on its own standard industrial classification (ANZSIC) and its own standard commodity classification (ASCC). Nevertheless these are based on international standards and so can be used relatively easily for the purpose of reviewing the ICT sector definition.

19. The methodology adopted for this review is to look at the specialisation ratio of the industries included in the definition. This is one of the standard ways in which countries decide on the specific classes to be included within a standard industrial classification.

ISIC 3000 – Office, accounting and computing machinery

20. The major commodity outputs from businesses coded to this industrial class are

- Data processing machines (other than main frame)
- Data processing machines parts and accessories
- Other electronic office and accounting machinery
- Calculators and electronic machines incorporating a calculator
- Data processing machines – mainframe
- Electrical capacitors, electronic integrated circuits, electrical appliances

21. It could be expected that each of these commodities would be considered to be ICT goods although the third on the list (other electronic office and accounting machinery) could contain both ICT and non-ICT goods. This category contributes something in the order of 20% of the total commodity output. Thus the industrial class would have a specialisation ratio of at least 80% (and probably higher) and so should definitely be included within the ICT sector definition.

ISIC 3130 – Insulated wire and cable.

22. The major commodity outputs from businesses coded to this industrial class are:

- Insulated cable, wire and strip – other than optical fibre cable or winding wire,

- Optical fibre cable
- Uninsulated copper and aluminium stranded wire, rope, cables etc
- Coaxial cable and other coaxial electric conductors
- Winding wire
- Automotive insulated cable wire or strip
- Other electronic equipment and parts
- Electric generating sets and rotary converters
- Outdoor lighting other than fluorescent

23. The largest commodity component of this group in Australia is the first, accounting for about 60% of the output. This commodity is unlikely to be considered an ICT good as it standard cable that is used for all sorts of purposes. The second commodity, optical fibre cable is likely to be an ICT good and this accounts for about 20% of the output. The third largest commodity is uninsulated wire and cables, which is unlikely to be considered to be an ICT good. This accounts for nearly 10% of the output.

24. Thus the industry in Australia could be considered to produce about 25% of ICT goods and 75% of non-ICT goods. On this basis it ought to be excluded from the industrial sector definition of the ICT sector.

ISIC 3210 and 3230 – Manufacture of electronic valves and tubes and other electronic components; manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods

25. These ISIC classes are combined into one in Australia and so cannot be studied separately using the Australian data. However, the classes clearly contain both ICT and non-ICT goods. On the basis of the Australian data, non-ICT goods appear to make up the majority of the output and so the combined classes should be subject to review. However, no definitive answer can be given on the basis of the Australian data.

ISIC 3220 – Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy

26. The major commodity outputs from businesses coded to this industrial class are:

- Radio broadcast studio equipment, tv studio equipment, tv or radio transmitters, radio transceivers
- Telecommunications equipment parts
- Carrier telephone/telegraph equipment
- Complete telephones (other than mobile, cellular and car phones)
- Mobile, cellular and car phones
- Satellite receivers
- Data modem equipment
- Electronic switchboards
- Other electronic equipment and parts

27. The largest commodity components of this group in Australia are the first three categories. Each of the listed commodities could be considered to fall within the scope of ICT goods and so the

specialisation ratio is likely to be in the order of 100%. This industry therefore ought to be included in the ICT sector definition.

3312 – Manufacture of instruments and appliances for measuring, checking, testing navigating and other purposes, except industrial process control equipment

28. The major commodity outputs from businesses coded to this class are:

- Surveying instruments, physical or chemical analysis instruments, electricity meters and other measuring, checking and testing instruments, appliances and parts
- Radar equipment, radio navigational aid equipment, radio remote control equipment, direction finding compasses and other navigational instruments
- Mechano-therapy, massage and psychological aptitude testing apparatus, ozone, oxygen or aerosol therapy apparatus, artificial respiration or other therapeutic respiration apparatus and other breathing appliances and gas masks.
- Other electronic equipment and parts

29. The largest of these commodities in Australia is the first and it clearly meets the criteria agreed for an ICT good. The second also appears to meet the principles behind the ICT sector definitions - but there is no data available for it for confidentiality reasons. The latter two commodities probably contain a mixture of ICT and non-ICT goods. It could be expected that greater than 50% of the sales for this industry class would be ICT goods based on the current principles of definition and so the class should continue to be included within the ICT sector.

3313 – Manufacture of industrial process control equipment

30. This class is not separately recorded in the industrial classification used in Australia – due mainly to the fact that there is very little of this manufacturing activity performed in Australia. Thus there is no information available to enable any conclusions to be drawn about its inclusion within the ICT sector definition.

5150 – Wholesaling of machinery, equipment and supplies

31. As discussed elsewhere, this ISIC class is very broad, covering a whole range of office machinery, equipment and supplies in addition to computer and telecommunications equipment. If the proposal before the UN Classifications Group is accepted, this class will be dissected into two parts – one relating to the wholesaling of computer and telecommunications goods and one to the wholesaling of other goods. In that case it would make eminent sense to modify the definition of the ICT sector.

32. Should the proposal not be accepted, it would be appropriate to look at the specialisation ratio for ICT goods within this category. Based on the Australian data for 1998-99, the share of total income attributed to ICT goods is nearly 40% of the total income of this ISIC class. Based on that proportion, it would be sensible to consider excluding ISIC class 5150 from the definition if it stays in its current form.

6420 - Telecommunications services

33. According to the 1998-99 Australian data, the share of ICT income to total income of businesses classified to this industry is almost 100%. Thus the class should be retained within the definition.

7123 – Renting of office machinery and equipment (including computers)

34. This class includes firms that rent all types of office machinery and equipment, including ICT equipment. According to a recent Australian survey, the share of income generated from the renting of computers was only in the order of 1%. On this basis, the class should be excluded from the ICT sector definition.

72 - Computer services

35. According to the 1998-99 Australian data, the share of ICT income is almost 100% of the total income of businesses classified to these classes. Hence all the classes within ISIC Division 72 should be retained within the definition.

ANNEX C – THE USE OF NAICS TO PROVIDE DATA BASED ON THE OECD ICT SECTOR DEFINITION: THE U.S. EXPERIENCE⁴

36. The data provided by the U.S. Census Bureau to the OECD for its 2000 ICT sector publication included those NAICS categories corresponding to the ICT ISIC classes that were considered to be significant, and contained primarily ICT content. Only exception was the ISIC Rev.3 class 7123, that was included in its entirety. This Annex provides the NAICS classes used in providing such data.

37. The U.S. delegation recommended that, since the OECD definition contains whole ISIC classes, countries with more detailed breakouts available should provide data based on their finer national classifications. By including the mapping used to provide ICT sector statistics, data users will have the information they need to correctly use the data. Over time, as more countries are able to produce more detailed data, the OECD will be able to revise the specificity of the definition.

Table C.1 - Mapping of NAICS into the OECD ICT sector definition.

Shaded rows indicate NAICS codes for which the U.S. reported ICT data to OECD in 2000.

ISIC	NAICS		
	Title	Description	
3000	333311	Automatic Vending Machine Manufacturing	Change making machines
	333313	Office Machinery Manufacturing	Except dictation machines
	333315	Photographic and Photocopying Equipment Manufacturing	Blueprinting, whiteprinting and photocopying equipment
	334111	Electronic Computer Manufacturing	
	334112	Computer Storage Device Manufacturing	
	334113	Computer Terminal Manufacturing	
	334119	Other Computer Peripheral Equipment Manufacturing	
	334418	Printed Circuit/Electronics Assembly Manufacturing	Modems, external consumer type
339942	Lead Pencil and Art Good Manufacturing	Hole punchers, label making equipment, rolodex address files, paper cutters, pencil sharpeners, staplers, staple removers, and tape dispensers	
3130	331319	Other Aluminum Rolling and Drawing	Insulated wire made in drawing plants
	331422	Copper Wire (except Mechanical) Drawing	Insulated wire made in drawing plants
	331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing and Extruding	Insulated wire made in drawing plants
	334419	Other Electronic Component Manufacturing	Wiring harness assemblies
	335921	Fiber Optic Cable Manufacturing	
	335929	Other Communication and Energy Wire Manufacturing	
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	Wiring harnesses, wiring cords, and sets including appliance and extension cords	
3210	334411	Electron Tube Manufacturing	
	334412	Printed Circuit Board Manufacturing	
	334413	Semiconductor and Related Device Manufacturing	
	334414	Electronic Capacitor Manufacturing	
	334415	Electronic Resistor Manufacturing	
	334418	Printed Circuit/Electronics Assembly Manufacturing	Except modems, external consumer type
	334419	Other Electronic Component Manufacturing	Other including attenuators and rectifiers
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	Capacitors and condensers	
3220	334210	Telephone Apparatus Manufacturing	Except telephone answering machines
	334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	Except pagers, antennas, satellites, satellite dishes, and headphones
	334290	Other Communications Equipment Manufacturing	Intercommunication systems
	811213	Communication Equipment Repair and Maintenance	Repairing products of ISIC 3220 other than personal and household but including telephones

4. Based on the comments received by the U.S. delegation to the OECD Working Group on Indicators for the Information Society (WPIIS) on August 2, 2001.

ISIC	NAICS		
	Title	Description	
3230	333313	Office Machinery Manufacturing	Dictation machines (MARGINAL)
	333315	Photographic and Photocopying Equipment Manufacturing	Sound recording and reproducing equipment for motion pictures
	334210	Telephone Apparatus Manufacturing	Telephone answering machines
	334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	Pagers, antennas, satellite dishes, and headphones
	334290	Other Communications Equipment Manufacturing	Garage door, TV and other remote control units
	334310	Audio and Video Equipment Manufacturing	
	334419	Other Electronic Component Manufacturing	Phonographic needles and styluses
811211	Consumer Electronics Repair and Maintenance		Repairing commercial sound and video reproducing equipment such as VCRs and other products of ISIC 3230 other than personal and household
	811213	Communication Equipment Repair and Maintenance	Repairing communications equipment such as public address and other products of ISIC 3230 other than personal and household
3312	332212	Hand and Edge Tool Manufacturing	Precision measuring devices including inspection, quality control, tool room, and machinists'
	333314	Optical Instrument and Lens Manufacturing	Test, inspection, and measuring instruments
	333315	Photographic and Photocopying Equipment Manufacturing	Densitometers, sensitometers, exposure meters and range finders
	333319	Other Commercial and Service Industry Machinery Manufacturing	Automotive wheel mounting and balancing equipment
	333999	All Other General Purpose Machinery Manufacturing	Balancing equipment other than wheel
	334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System & Instrument Manufacturing	
	334512	Automatic Environmental Control Manufacturing for Residential, Commercial and Appliance Use	
	334514	Totalizing Fluid Meter and Counting Device Manufacturing	Except parking meters
	334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	Except signal generators and averages
	334516	Analytical Laboratory Instrument Manufacturing	
	334518	Watch, Clock, and Part Manufacturing	Chronometers
	334519	Other Measuring and Controlling Device Manufacturing	Except metal detectors
	339111	Laboratory Apparatus and Furniture Manufacturing	Other laboratory apparatus including balances, calimeters, incubators, shakers and stirrers, and microtomes
	339112	Surgical and Medical Instrument Manufacturing	Medical thermometers
339942	Lead Pencil and Art Good Manufacturing	Pantographs	
811219	Other Electronic and Precision Equipment Repair and Maintenance	Repairing electrical aircraft instruments and other products of ISIC 3312 other than personal and household	
3313	334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	
	811219	Other Electronic and Precision Equipment Repair and Maintenance	Repairing industrial process control instruments and other products of ISIC 3313 other than personal and household
5150	*421120	Motor Vehicle Supplies and New Part Wholesalers	Engine testing equipment and service station equipment
	*421210	Furniture Wholesalers	Nonhousehold
	*421410	Photographic Equipment and Supplies Wholesalers	Motion picture studio and theatre equipment
	421420	Office Equipment Wholesalers	
	421430	Computer and Computer Peripheral Equipment and Software Wholesalers	
	421440	Other Commercial Equipment Wholesalers	
	*421450	Medical, Dental and Hospital Equipment and Supplies Wholesalers	Except surgical and orthopedic instruments, equipment and supplies
	*421490	Other Professional Equipment and Supplies Wholesalers	Except school classroom equipment
	*421610	Electrical Apparatus and Equipment, Wiring Supplies and Construction Material Wholesalers	Except electric lighting fixtures and light bulbs
	*421690	Other Electronic Part and Equipment Wholesalers	Except blank video or audio tapes and citizen's band two-way radios
	*421720	Plumbing and Heating Equipment and Supplies (Hydronics) Wholesalers	Industrial power boilers
	421740	Refrigeration Equipment and Supplies Wholesalers	
	421810	Construction and Mining (except Petroleum) Machinery and Equipment Wholesalers	
	421820	Farm and Garden Machinery and Equipment Wholesalers	
	*421830	Industrial Machinery and Equipment Wholesalers	Except ladders
	*421840	Industrial Supplies Wholesalers	Except box shooks, cooperage, and printers' supplies
	*421850	Service Establishment Equipment and Supplies Wholesalers	Except sprinkler systems
	421860	Transportation Equipment and Supplies (except Motor Vehicle) Wholesalers	
	*421910	Sporting and Recreational Goods and Supplies Wholesalers	Outboard motors and boats including motor and sail, and canoes
	*421990	Other Miscellaneous Durable Goods Wholesalers	Coin-operated game machines, fire extinguishers, firearms and ammunition
*422120	Stationary and Office Supplies Wholesalers	Inked ribbons and photocopying supplies	
*422690	Other Chemical and Allied Products Wholesalers	Epoxy repair products	
*422990	Other Miscellaneous Nondurable Goods Wholesalers	Foam rubber; taxidermy supplies; and broom, mop, and paint handles	

ISIC	NAICS		
	Title	Description	
6420	513111	Radio Networks	Radio relay systems
	513120	Television Broadcasting	T V relay systems
	513220	Cable and Other Program Distribution	
	513310	Wired Telecommunications Carriers	
	513321	Paging	
	513322	Cellular and Other Wireless Telecommunications	
	513330	Telecommunications Resellers	
	513340	Satellite Telecommunications	
	513390	Other Telecommunications	
	514191	On-Line Information Services	
812990	All Other Personal Services	Operating coin-operated (pay) telephone equipment	
7123	532420	Office Machinery and Equipment Rental and Leasing	Computer equipment rental
72	511140	Database and Directory Publishers	Data base publishing
	511210	Software Publishers	
	514199	All Other Information Services	Other including information search services and telephone-based recorded information services
	514210	Data Processing Services	Except microfilming services
	541511	Custom Computer Programming Services	
	541512	Computer Systems Design Services	
	541513	Computer Facilities Management Services	
	541519	Other Computer Related Services	Except computer disaster recovery, software installation, and other computer related services
	541519	Other Computer Related Services	Disaster recovery services, software installation, and other computer related services
	561410	Document Preparation Services	Computer word processing
811212	Computer and Office Machine Repair and Maintenance	Repairing accounting, computing, photocopying, typewriting, and other office machines	

Source: U.S. Census Bureau, 2001