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# THE MODEL SURVEY OF COMPUTER SERVICES STATISTICS CANADA'S EXPERIENCE

Statistics Canada

# THE MODEL SURVEY OF COMPUTER SERVICES
# STATISTICS CANADA'S EXPERIENCE

## INTRODUCTION

1. One objective of the model survey of computer services is to provide a means for countries to collect internationally comparable data and to test the Central Product Classification[1] as applied to a particular service industry. This paper reports on the use of modules from the survey.

## RELATIONSHIP OF MODEL SURVEY TO STATISTICS CANADA SURVEYS

2. The model survey is in the form of 11 modules for the collection of the data on computer services. It is not expected that a country would implement all 11 modules as a single survey. Rather, these modules would be adapted to conform to the statistical needs and the configuration of the survey framework peculiar to that country. The modules are as follows:

| Module | Topic |
|---|---|
| 1 | Revenues from the sale of goods and services |
| | 1.1 Revenues from the sale of computer services |
| | 1.2 Revenues from the sale of computer-related goods and services |
| | 1.3 Revenues from other sources |
| 2 | Goods and services used in the operation |
| 3 | Purchases of goods and services for resale |
| 4 | Inventories |
| 5 | Supplementary questions concerning the basis of accounting |
| 6 | Exports |
| | 6.1 Computer services |
| | 6.2 Computer-related goods and services |
| 7 | Imports |
| | 7.1 Computer services |
| | 7.2 Computer-related goods and services |
| 8 | Supplementary questions regarding packaged software product revenues |
| 9 | Employment |
| 10 | Fixed assets, additions and disposals |
| 11 | Software research and development |

3. Seven of the eleven proposed modules are now fully implemented at Statistics Canada and two are partially implemented. A number of surveys or data sources have been used; a brief description of these surveys and data sources can be found in annex 1. A description of the relationship between these surveys and each module can be found in annex 2.

4. The next section describes and discusses the collection experience for those modules now implemented in Statistics Canada.

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[1] "Provisional Central Product Classification", Statistical Office of the United Nations, ST/ESA/STAT/SER.M/77, New York, 1991.

## IMPLEMENTATION OF THE MODEL SURVEY

### MODULE 1 - Revenues from the sale of goods and services

5. Statistics Canada's experience with module 1 has been very encouraging. The model survey's classification of outputs has been implemented with minimal difficulties. The following table presents the results obtained from the 1989 **Annual Survey of Software Development and Computer Services**. These results are based on 598 responses.

| Category | # of firms | revenues % |
|---|---|---|
| **1.1 COMPUTER SERVICES** | | |
| **Packaged software products (own design) - CPC 841** | | |
| - Systems and user tool software | 194 | 3.0 |
| - Application software | 258 | 4.5 |
| **Professional computer services - CPC 842** | | |
| - Consultancy related to the installation of hardware | 115 | 1.3 |
| - Systems and technical consulting | 192 | 4.8 |
| - Custom software development | 238 | 11.1 |
| - Programming services | 173 | 4.8 |
| - Computer facilities management services | 59 | 7.1 |
| - Systems maintenance | xxx | xxx |
| - Other professional computer services | 94 | 6.2 |
| **Computer processing services - CPC 843** | | |
| - Data Processing & tabulation services | 76 | 10.0 |
| - Data entry services | 68 | 1.4 |
| - Other computer processing services | 61 | 4.7 |
| **Data base services - CPC 844** | 39 | 2.5 |
| **Computer repair & maintenance services - CPC 845** | 115 | 5.7 |
| **Other computer services - CPC 849** | 86 | 2.2 |
| **1.2 COMPUTER RELATED GOODS AND SERVICES** | | |
| Packaged software resold | 139 | 3.1 |
| Computer hardware resold | 275 | 10.1 |
| Computer services resold | xxx | xxx |
| Hardware lease and rental | 78 | 8.2 |
| Network services | 29 | 5.8 |
| Computer related training | 190 | 1.3 |
| **1.3 REVENUES FROM OTHER SOURCES** | | |
| Royalties and patent fees received | xxx | xxx |
| Services to related parties not included above | 34 | 2.2 |
| Other goods and services | xxx | xxx |
| Operating subsidies | xxx | xxx |

Note: xxx - not collected in the Canadian survey

6. There are very few large companies in Canada for which the major source of revenue is **packaged software products of own design (CPC 841)**. This industry segment is

characterized by a large number of small to medium size businesses. Software products of own design account for 7.5% of the computer services industry's operating revenues in Canada[2].

7. The Canadian questionnaire intentionally requests revenues earned, thereby avoiding the confusion of whether software is sold, rented or licensed. The amounts reported likely include a royalty component since packaged software developers sometimes market their product by selling the distribution rights to a third party. Ideally the royalty component should be distinguished from the non-royalty component; this information would provide a useful insight into the means used by developers to market their products. At this time, however, the Canadian survey does not make that distinction.

8. **Computer professional services (CPC 842)** account for a little over one-third of Canadian computer service industry's operating revenues. The most important item is custom software development which represents 11% of industry revenues. We have experienced very little difficulty in obtaining accurate responses for CPC 842. Most systems integrators are able to report revenues from the sale of computer hardware separately from the sale of professional computer services. However, it is more difficult to obtain accurate detail for the sub-categories as the respondents must be willing to do some research to estimate the value of items that, in many cases, are not recorded in the companies' accounts.

9. **Computer processing services (CPC 843)** account for 16% of the Canadian computer services industry's operating revenues. In our experience CPC 843, and in particular CPC 8431 - Data processing and tabulation services, is one of the most difficult categories to interpret and apply due to the ambiguity of the term "processing" and to the generalized use of computer equipment to offer a wide range of services.

10. In order avoid misunderstanding, the following criteria are used to identify computer processing services:

a) the essence of the service is to provide the use of computer equipment and software for different applications;

b) the client determines the application, the supplier only provides the means.

These criteria are used to avoid the inclusion of services such as "payroll administration services", "market research services" and "public opinion polling services" into the computer processing services category even though they involve the processing of data by computer, . The rationale is that the processing of data, in these cases, is a necessary activity to provide the service but that it does not represent the intrinsic nature of the service[3]. In practice there will always be borderline cases where these principles are not easily applied. It then becomes necessary to carefully analyse the activities of the firm in order to classify it to the proper industry and its service(s) to the proper service category(ies). This, of course, implies obtaining detailed information on the activities of

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[2] The Canadian questionnaire asks respondents to indicate all revenues from software products and relies on the questions in module 8 to distinguish software of own design from that designed by a third-party.

[3] "Accounting and administrative" in the case of payroll administrative services and "information or intelligence gathering" in the cases of market research and public opinion polling services.

such firms.

11. The main difficulty encountered in the collection of data for **CPC 844 - Data base services** has been to convey the intended meaning of the category. Our experience has shown that the expression "on-line information retrieval service" is better understood in the industry. We have also found that in order to get good coverage of this activity, it is necessary to survey different types of organizations, in particular: data base vendors (firms specializing in the electronic distribution of a wide range of information usually obtained from or distributed for others), computer service bureaus who often provide this service as a secondary activity and subsidiaries of large organizations who specialize in the provision of these and related services to related parties.

12. In Canada, **Computer repair and maintenance services (CPC 845)** tend to be provided mainly by the wholesalers of computer equipment. There are few companies whose main source of revenue derives from this service. It accounts for about 3% of the computer services industry's operating revenues in Canada.

13. The model survey also suggested that data about **Services to related parties not included in the above** be collected. This information is particularly important when firms expand abroad; in those cases development charges and management fees typically become an increasing component of revenues[4]. In the case of software development firms, however, there is a danger of including revenues here that more correctly belong under software products. It is important to keep in mind the distinction between the nature of the payment (sale, rental, royalty, development charges to subsidiary) and the service provided. This category is small in Canada, approximately 2% of revenues.

14. To date no data has been collected for the categories **Royalties and patent fees** or **Operating subsidies** of section 1.3 of module 1.

**Module 2 (Goods and services used in the operations)**

15. Respondents find the reporting of expenses to be one of the more burdensome aspects of the survey. This is because companies do not necessarily maintain accounts for these categories. Given the small variation in the distribution of expenses over time there may be some advantage in posing the detailed questions less frequently than those relating to outputs.

**Module 3 (Purchases of goods and services for resale)**

16. There are no particular problems associated with this module.

**Module 6 (Exports)**

17. This module poses some difficulties due to the tendency of firms with foreign subsidiaries to report consolidated earnings. Conversely, subsidiaries of foreign firms will sometimes report sales of the foreign parent. These problems can be detected by the addition of a question asking the company to report separately the foreign sales of the company and those of its affiliates. This question is useful in detecting reporting errors but it is also useful in monitoring the expansion of firms into foreign markets, a

[4] In fact, some Canadian firms show management fees from subsidiaries as a negative expense rather than a revenue.

phenomenon not adequately measured by exports alone. The Canadian experience indicates that software products account for over 50% of export earnings while custom software explains another 11%. Processing services makes up only 3%.

**Module 7 (Imports)**

18. To obtain complete coverage of imports, the questions in Module 7 need to be addressed to all importers of computer services. In the absence of a comprehensive survey, data can be compiled from a variety of sources. The imports of computer services are, however, difficult to measure for a number of reasons including those of obtaining adequate coverage of importers.

19. Payments for the import of software can take two forms:

a) Packaged software has the attributes of a good and can be sent across the border in return for direct payment. It can, in this case, be measured as part of merchandise trade. In Canada, it is an item that has been added to the harmonized commodity description and coding system and statistics are now being compiled as part of our merchandise trade statistics.

b) Royalty payments can be made to a foreign country for the right to use or distribute software. At present, in Canada, statistics relating to this type of transaction are collected as part of a general category called royalties for our balance of payments statistics. Until a more elaborate classification of services is adopted in the Trade in Services survey used to compile these statistics, it is not possible to measure the import of this service by isolating the royalties paid for the import of software.

20. Software is the most important computer service imported in Canada though not the only service imported. In Canada, an estimate of payments (other than royalties) to other countries for computer services is made in our balance of payments statistics. Examination of firms reporting to the Trade in Services survey, used to compile these figures, indicates that most are Canadian subsidiaries of US multi-nationals which are not computer or software companies. This fact suggests that those transactions are payments to finance these firm's computer networks; these could be regarded as payments for computer processing services, and to some extent, data base services.

21. An approach to measuring the imports of software products is to survey importers directly. In Canada, this was done in 1988, before it was decided to delineate software products as a separate category for collection as part of merchandise trade statistics. Bacause software is imported by firms outside the computer service industry and since almost all the important importers of software products were found in the Wholesalers of computer equipment and software industry, it was relatively simple to send a supplementary questionnaire to them asking for details on the nature and origin of software purchased for resale. The results of this survey also allowed imports by Canadian subsidiaries of foreign software companies, Canadian subsidiaries of foreign computer manufacturers and other wholesalers to be distinguished. This survey was useful in extending coverage but still left uncovered imported software that was not handled by these wholesalers. It remains to be seen if adequate statistics on imported software products can be obtained through merchandise trade statistics.

**Module 8 (Supplementary questions regarding packaged software revenues)**

22. This module has proved to be of significant value to distinguish the sale of software of own design from the sale of software developed by others and to identify the country of origin of the latter. The value of this information increases when it is combined with data collected from wholesalers of software since it then provides a more complete perspective on the domestic packaged software products market.

**Module 9 (Employment)**

23. Module 9 is partially satisfied by the Annual Survey of Software and Computer Services. The number of full and part-time employees is requested. However, employment data by sex or by occupational class are not collected by the annual survey.

**Module 10 (Fixed assets, additions and disposals)**

24. Module 10, investment, is not yet implemented. The Canadian Capital Expenditure Survey does not yet produce separate information for the computer services industry. Some of the large, relatively capital-intensive companies such as computer service bureaus and computer leasing firms are included in the survey but the industry is not yet sufficiently represented in the sample to produce estimates of investment for this industry.

**Module 11 (Software research and development)**

25. Since the Research and Development in Canadian Industry survey covers all industries, software R&D is available for the entire economy. Respondents are requested to indicate the proportion of total R&D that is devoted to software. Since this proportion is high for firms classified to the computer services industry, the survey of Research and Development in Canadian Industry questions dealing with the composition of total R&D expenses (salaries, land, building and equipment) are adequate to determine the elements of this module.

26. Although the survey of Research and Development in Canadian Industry requests information on type of R&D (basic, new processes, new products, etc) it does not determine whether the resulting software is for internal use, embedded within a product, or is a marketed product itself. This distinction would permit a more complete identification of developers of marketed software to determine the extent of software development as a secondary activity.

**THE USE OF ISIC**

27. The information on service commodities collected by the Annual Survey of Software Development and Computer Services allows for the compilation of homogeneity ratios[5] on the basis of the ISIC definitions.

28. The table below provides specialization and coverage ratios for ISICs 7210 to 7250 for the Canadian computer services sector.

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[5] Classification theory emphasizes the importance of the homogeneity of classes. The degree of homogeneity of activity/industry statistics is measured by homogeneity ratios (see ISIC Rev. 3, chapter 3, section E).

**HOMOGENEITY RATIOS**

| | 7210 | 7220 | 7230 | 7240 | 7250 |
|---|---|---|---|---|---|
| Specialization ratio | 76.5 | 81.9 | 73.2 | 68.3 | 86.5 |
| Coverage ratio | 35.0 | 79.9 | 86.9 | 70.4 | 62.7<br>18.6 |

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ISIC 7210 - Hardware consultancy
ISIC 7220 - Software consultancy and supply
ISIC 7230 - Data processing
ISIC 7240 - Data base activities
ISIC 7250 - Maintenance and repair of office, accounting and computing machinery **N.B. The data in the table relate to the repair and maintenance of computing machinery only.**

Although there is evidence that computer services are produced by industries other than computer services industries, the lack of data prevents us from taking that secondary production into account in the compilation of the coverage ratios shown above. These ratios should therefore be interpreted carefully; they reflect the degree of coverage within the computer services sector rather than the degree of coverage within the economy. The one notable exception is computer repair and maintenance (ISIC 7250); in this case information is available on the secondary production of wholesalers. For the purpose of comparability, two coverage ratios are provided for ISIC 7250: one that takes into account the secondary production of wholesalers (18.6) and one that does not (62.7).

29. The application of ISIC definitions to the Canadian computer services sector results in relatively high specialization ratios. These ratios meet, or closely meet, the minimum standard used in Canada (70.0) for the delineation of manufacturing industries. The coverage ratios, however, are very low for ISICs 7210 and 7250. Industry statistics for these ISICs compiled by Canada therefore will not be comparable to industry statistics compiled for these industries by countries where these ISICs do accurately describe the organization of the computer service sector. In Canada the activity of hardware consultancy is mainly carried out by establishments belonging to ISIC 7220 - Software consultancy and supply.

30. It appears also that in Canada there are not enough establishments separately specializing in the repair and maintenance of computing machinery to warrant the delineation of a separate industry. As mentioned before, this activity is primarily carried out by establishments belonging to the wholesale trade industry.

## CONCLUSION

31. The purpose of this paper was to show how the model computer services survey was implemented in Canada and how successful it was in meeting its objectives. We have demonstrated that most of the modules have been implemented successfully even though there are several areas yet to be perfected.

32. The systematic collection of detailed commodity information, for the computer services industries is relatively new in Canada. As one would expect, there have been some difficulties in the early stages in properly identifying the target population and in obtaining consistent responses from all respondents. For the most part, however, these "start-up" difficulties have been solved through dialogue with industry associations and individual respondents and through the development of definitions in collaboration with the industry and its members. Still, much remains to be done in the area of profiling to further

our understanding of the nature of certain organizations and of the services they provide. In some cases, the boundaries between communications, value-added communications, computer processing and data base services are blurred; it is not always clear if these services are provided as a bundle or separately by one firm or result from the cooperation of independent firms.

33. The launching of new surveys necessarily implies that the statistical agency must acquire an understanding of the targeted sector. The surveying of the computer services sector is particularly challenging in this regard; the rapid evolution of the computer technology, its integration with communications technologies and their wide use across the economy lead to the rapid development of new products and the entry into the "computer services" market of many new businesses and of businesses traditionally involved in other types of activities. In this type of environment, classification and definitional issues are particularly important.

34. Standard classifications and model surveys are important in order to obtain internationally comparable data. However it must be kept in mind that there are other factors that determine whether data are compatible:

- the choice of survey units and a common treatment of "captive companies";

- the procedure for determining the classification of borderline companies;

- the criteria for ruling on companies that could fall into more than one category (eg. communications or computer services; accounting services or computer services).

## ANNEX 1 - DESCRIPTION OF THE RELEVANT CANADIAN SURVEYS

### Annual Survey of Software and Computer Services

**Context**: An annual production survey which collects income and expenditure items. Provides information on exports to support sample up-dating for balance of payments surveys. Production and sales data are supplied for the input-output statistics.

**Frame**: Corporate tax filers coded to CSIC 772[6] . Some large unincorporated entities are also included in the survey. Small firms, incorporated or not, are included in industry estimates.

**Implementation issues:** Rapid evolution of the industry gives rise to definitional problems, both in terms of reporting units and services provided.

### Balance of Payments

**Context**: Annual survey of large exporters and importers reporting receipts and payments for services by country and relation of client. Provides trade in services information for commodities to national accounts.

**Frame**: All large corporations known to be active in the international trade in services. This is a judgement sample rather than a probability sample from a well defined frame. However, it is considered by management to be reasonably reliable.

**Implementation issues**: The services commodity classification used for this survey is not readily comparable to that proposed in the model survey.

### International Merchandise Trade

**Context**: Provides estimates of imports of packaged software.

**Frame**: All customs documents with a transaction value exceeding $100Cdn (or $1200Cdn for an entire shipment).

**Implementation issues**: Since the Harmonized System (HS) is a classification of goods, no explicit categories were available for software imports. Theoretically, only the value of the recording medium (diskettes, tapes, etc.) was captured. In January, 1990, Statistics Canada implemented a classification refinement in order to permit the capture of software imports.

### Research and Development in Canadian Industry

**Context**: Provides information on the resources committed to R&D in Canada by industry. The survey requests information on the proportion of R&D devoted to software. The survey covers all industrial sectors including the computer services industry.

**Frame**: All R&D performers in Canada.

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[6] The Canadian SIC 772 corresponds to ISIC categories 721, 722, 723, 729 and part of ISIC categories 725 and 7213.

**Implementation Issues**: The the survey of Research and Development in Canadian Industry suffers from the same classification difficulties as the Annual Survey of Software and Computer Services with respect to computer services companies (see below).

**Annual Survey of Wholesale Trade**

**Context**: Provides information on sales and commissions. This survey does not provide commodity detail and consequently information of software sales is not available. However, a supplement to the survey for 1988 obtained sales of software by country of origin for wholesalers of computer equipment and packaged software.

**Frame** (for the supplementary survey): Firms in CSIC 5744 (ISIC 5150) with revenues exceeding $7 million. CSIC 5744 covers most wholesale firms distributing computer hardware and packaged software.

**Implementation Issues**: Many classification problems arise due to the difficulty in determining whether a company properly belongs in computer services or wholesaling. It is important to view the two surveys together.

## ANNEX 2 - THE MODULES AND THE CANADIAN SURVEYS

1. Modules 1,3,6 and 8 are contained in the Annual Survey of Software Development and Computer Services. Module 8 is complemented by the Annual Wholesale Trade Survey.

2. Module 2 has not yet been tested in the Canadian context.

3. Module 4, inventories, has not been implemented in the Annual Survey of Software and Computer Services but it is implemented in the Annual Wholesale Trade Survey.

4. Module 5, accounting practices, has not been implemented since we have determined that the generally accepted practice in Canada is to use the accrual basis of accounting in Canada.

5. Module 7, imports, is satisfied by combining data from the customs documents and Balance of Payments surveys. Since the Harmonized System (HS) does not recognize software, Canada has further refined the HS as used in customs documents to obtain information on this product.

6. Module 9 is partially satisfied by the Annual Survey of Software and Computer Services. The number of full and part-time employees is requested. However, employment information by sex or by occupational class are not collected by the annual survey.

7. Module 10, investment, is not yet implemented. The Capital Expenditure Survey, in Canada, does not produce information for the computer services industry. Some large, relatively capital-intensive companies such as computer service bureaus and computer leasing firms are included in the survey but the industry is not sufficiently represented at this time to produce estimates of investment.

8. Module 11, Software R&D, is covered by the Research and Development in Canadian Industry survey.

## ANNEX 3 - RELATIONSHIP BETWEEN THE CPC AND THE MODEL SURVEY

| Current CPC | Model survey |
|---|---|
| 84100 - Consultancy services related to the installation of computer hardware | 8421 - no change |
| 84210 - Systems and software consulting services | 8422 - Systems and technical consulting services |
| | 841 - Packaged software products |
| | 8411 - Systems and user tools software<br>8412 - Application software |
| | 8423 - Custom software development services |
| 84220 - Systems analysis services<br>84230 - Systems design services<br>84240 - Programming services | 8424 - Systems analysis and programming services |
| 84250 - Systems maintenance services | 8426 - Systems maintenance services |
| 84310 - Input preparation services | - eliminated as a separate category. Part of "Other data processing service" |
| 84320 - Data processing and tabulation services<br>84330 - Time sharing services | 8431 - Data processing and tabulation services |
| 84390 - Other data processing services | 8425 - Computer facilities management services |
| | 8439 - Other computer processing services |
| 84400 - Data base services | 844 - no change |
| 84500 - Maintenance and repair services of office machinery and equipment including computers | 845 - no change |
| 84910 - Data preparation services | - eliminated as a separate category |
| no apparent equivalent category | 8432 - Data entry services |

## ANNEX 4 - DEFINITION OF CLASSES USED FOR MODEL SURVEY

### 841 - Packaged software products[1]

**8411 - Systems and user tools software**[2] - The development and marketing (sale, rental, leasing and/or licensing) of systems and user tools packaged software. Documentation, maintenance and other support services such as assistance in installation and training can be an integral component of this service. The retail of packaged software is classified to **CPC 63252 -Retail sales of computers and non-customized software.** The custom design of software or the modification of packaged software to meet specific user needs is classified to **8423 - Custom software development services.** **ISIC 7220**

**8412 - Application software**[3] - The development and marketing (sale, rental, leasing and/or licensing) of application packaged software. Documentation, maintenance and other support services such as assistance in installation and training can be an integral component of this service. The retail of packaged software is classified to **CPC 63252 - Retail sales of computers and non-customized software**. The custom design of software or the modification of packaged software to meet specific user needs is classified to **8423 -Custom software development services.** **ISIC 7220**

### 842 - Professional services

**8421 - Consultancy services related to the installation of hardware -** The provision of advice and assistance on matters related to the management of businesses' and institutions' computer resources. This service may consist of assessing the computer needs of the organization, of planning the organization's acquisitions, of counselling the client on the procurement of hardware and software, of performing an audit on the computer related operations of the organization, etc. The provision of advice on technical matters related to computer systems is classified to **8422 - Systems and technical consulting services**. **ISIC 7210**

**8422 - Systems and technical consulting services -** The provision of advice and assistance on technical matters related to computer systems. This service may consist of conducting feasibility studies on the implementation of a system, of providing specifications for a data base design, of providing technical expertise for the integration of hardware and software, of providing guidance and assistance during the start-up phase of a new system, of providing specifications to secure a data base, etc. The custom design of software is classified to **8423 - Custom software development services** and the provision of systems analysis and programming services is classified to **8424 - Systems analysis and programming services**. The training of personnel on the use of a computer system is classified to **CPC 92 - Education services.** **ISIC 7220**

**8423 - Custom software development services -** The development (analysis,design and programming) of software for, and to meet the requirements of, a specific client. The modification of packaged software is also included here. The provision of assistance during the installation phase and of training services can be an integral component of this service. The provision of systems analysis and programming services is classified to **8424 - Systems analysis and programming services.** **ISIC 7220**

**8424 - Systems analysis and programming services** - The provision of systems analysts and/or programmers services on a per diem basis to participate in one of the phases of the development of a system. The client supervises and retains the right to their work. The delivery of software commissioned by the client where the developer supervises and is involved in all phases (analysis, design and programming) of the development project is classified to **8423 - Custom software development services.** **ISIC 7220**

**8425 - Computer facilities management services** - The provision of personnel to manage and operate client owned (leased) computer facilities on an on-going basis whether these facilities are located on the client's or supplier's site. The incidental development of software can be an integral component of this service. The provision of computing resources is classified to **8431 - Data processing and tabulation services.** **ISIC 7230**

**8426 - System maintenance services** - The provision of assistance to keep computer systems (software) in a good working condition. The maintenance can be corrective or preventive and includes services such as testing to detect, locate and remove faults, improving existing programs, providing up to date user manuals and providing advice on the proper use of a system. If this service is provided as an integral component of a custom software development contract, a packaged software purchase contract or a computer facilities management contract, it is classified to the appropriate service category. **ISIC 7220**

**8429 - Other professional services** - The provision of computer related professional services not elsewhere classified. **ISIC 7220**

**843 - Computer processing services**

**8431 - Data processing and tabulation services** - The provision of computing resources for the purpose of processing information owned and supplied by the client. The execution of the application may be performed by the client (remote access) or the supplier. The provision of accounting (e.g. payroll accounting), statistical (e.g. tabulating and analyzing results of a market research survey), administrative (e.g. billing services from a computerized list supplied by the client), etc. services where the supplier uses computers to deliver the service are not classified here, but rather according to the nature of the service rendered. The provision of computer facilities management services is classified to **8425 - Computer facilities management services.** **ISIC 7230**

**8432 - Data entry services** - The capture of data (supplied by the customer) on tape, diskette or other medium or directly into a data processing system. **ISIC7230**

**8439 - Other computer processing services** - The provision of computer processing services not elsewhere classified. This category includes, among other services, the provision of tape and diskette conversion and rectification services, input preparation services and optical character recognition services. **ISIC 7230**

**844 - Data base services** - The provision of on-line information retrieval services. This

class includes the provision of the information (data base development) and of the computer resources (hardware and software - data base vending) necessary to store, retrieve and manipulate the information. The provision of the telecommunication network services (leased networks, public data networks or gateways) necessary to access data bases is classified to **CPC 752 - Telecommunication services.** **ISIC 7240**

**845 - Computer maintenance and repair services -** The repair and maintenance of computer hardware. Systems (software or application) maintenance services are classified to **8426 - Systems maintenance services.** **ISIC 7250**

**849 - Other computer services -** The provision of computer services not elsewhere classified. **ISIC 7290**

**ENDNOTES TO ANNEX 4**

1. A software package is a program (or set of programs) and associated documentation useful to many users and which can be used without modification on defined computer systems (i.e. with specific hardware and embedded software). The buyer is licensed to use the software, but cannot copy it or modify it without the permission and usually the involvement of the developer. In contrast, custom software is developed for and to meet the needs of a particular user. The buyer may or may not retain exclusive rights to the software.

2. System and user tool software are used to control the operations of computer systems and to support the development of systems or application software. This category includes, among others, communication and distributed data processing software (monitors, remote job entry, terminal support, etc.), compilers (assemblers), data management software (data entry and validation, file organization, handling, maintenance, matching and retrieval, etc.), development aid software (file conversion, program optimisers, program testing, translators, CASE tools etc.), system software (emulators, simulators, job accounting, systems security, etc.) and utility software (library, sort, merge, etc.).

3. Application software is used to carry out specific tasks. This category includes general purpose software such as word processing, spreadsheet, accounting and statistical analysis packages as well as software designed for use in specific fields such as credit card and instalment loan accounting software used in the banking field, actuarial accounting software used in the insurance field, computer aided design software used in the engineering and architectural fields, reservation management software used in the hotel management field and tutorial software used in the education field.