Australian Price Indexes for Computing Services

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1. Australian context

The Australian Bureau of Statistics has embarked on a long-term development program to progressively extend the scope of the producer price indexes into the service sectors of the economy.

The main objectives of the development program are to generate additional price index series to :

- assist in improving the quality of the national accounts by providing a wider range of deflators for deriving real measures of economic growth; and

- contribute to the development of new economy-wide measures of inflation, in particular the Stage of Production producer price indexes (see separate Voorburg Group paper on this topic), and be of use in their own right for industry analysis.

2. Classification and industry structure

The service industry price index development work is taking place within the classification framework provided by the Australian and New Zealand Standard Industrial Classification (ANZSIC). Work to date has focused on industry classes in the Transport and Storage and the Property and Business Services Divisions of the ANZSIC, including the Computer Services industry. The ANZSIC Classification is compatible with the international Central Product Classification, and they can be readily concorded on a one-to-many basis.

On the basis of the ANZSIC, and advice from industry sources, the Computer Services industry has been broken down into four classes:

- Data Processing Services

- Information Storage & Retrieval Services

- Computer Maintenance Services, and

- Computer Consultancy Services.

2.1 Data Processing Services

Investigations revealed that the most important activities undertaken by this industry class are:

(i) data entry / data keying service
(ii) image capture / OMR / OCR, and
(iii) tabulating service

(i) In many cases a typical commercial job is comprised of a mix of two or three of the above services. The main price determinants for a particular contract are an estimate of the time the job will take, and the volume and expected continuity of the work. Quotes to customers are based on the number of keystrokes per minute and / or the number of records created. This may include entering names, addresses and contact telephone numbers.

Some organisations within the data processing industry specialise in data entry or data keying of payrolls, invoices, bills payable, remittance processing and in the production of accounts statements such as trial balances. If their main source of revenue is derived from entering or keying of data then they are classified as in scope for this index. There is often a fine line to be drawn between these data processing enterprises and other enterprises whose main activities relate to accounting services such as Bookkeeping. These companies are classified to ANZSIC Group 7842 - Accounting Services and are excluded from the sample as their data entry work is only incidental to their main activities.

(ii) Another important class of activity in the data processing industry is image capture / OMR and OCR. This service is frequently used to process market research questionnaires, bureaux services, analysing airline dockets, credit card transactions and banking slips. Image scanning recognises the data to be captured and then feeds the data into software from where the information is processed, formatted and forwarded to the customer as per a contract agreement. The price charged is normally based on scanning an A4 size page containing a certain amount of impression captures. The data captured is copied into customised software before being transferred to the customer.

(iii) Tabulating, analysing and printing of reports is a specialist feature within the data processing industry where customers often require speedy results. Where this occurs, the keyed data is processed before being analysed and reports printed. There is an additional cost involved to analyse and print reports and the cost may rise by 15-20% per document.

De-duplication and verification of records is common. Records of data created are normally verified before being transferred to the customer. This activity is common where records containing name, address and contact numbers is carried

out. The cost to the customer to de-duplicate or verify records is not very high and is carried out while entering the data.

Long term data storage is not a primary activity of the data processing industry and in most cases data is normally stored for a maximum 30 days. The data is transferred directly to the customer through magnetic tapes, disks or direct into their mainframe computer through modems. Storage is never charged as the data stored is sourced by the customer at regular intervals.

2.2 Information Storage and Retrieval Services

This industry class consists of units mainly engaged in providing information storage and retrieval services (other than library or bibliographic services).

These services are offered by those organisations who have a computer mainframe / storage infrastructure and have a large capacity to hold information for clients on their hard disk / tapes.

There are two types of services of significance in this industry:

(i) physical storage; and
(ii) electronic storage.

(i) Physical storage (under a climate controlled environment) of coded, indexed computer disks / tapes. A fee is charged for retrieval, delivery and pick-up of the disks / tapes from the customers premises. Tapes / disks, which are more than five years old are archived. Data less than five years old are considered to be active documents and are usually retrieved frequently (typically more often than quarterly).

(ii) Electronic storage utilises mainframe system / servers. Information is received directly by a modem or from a dedicated line and stored on hard disk / tapes of the service provider. Documents stored electronically are used on a day to day basis by the customer through direct access to store and retrieve information from a specified hard disk of the service provider. A fee is charged for each access and when storage capacity rises over a certain limit on the hard disk, an extra fee is charged for the additional capacity used. There is a great deal of capital invested in these types of operations. Investment in the information storage and retrieval industry has increased in the last five years, a factor that is associated with the growth of information technology and telecommunication industries generally.

All transactions in the information storage and retrieval industry are governed by contracts. Contracts are based on the different types of service that are offered. In physical storage and retrieval services, the contract is based on the frequency of pick up, delivery and retrieval of the tapes / disks. The volume or quantity of disks / tapes stored also has an effect on the price. The distance from storage area

is directly proportional to the price charged and costs to pick up and deliver rise as the distance from the storage site increases.

For electronic storage, contracts are based on the number of times the system is accessed to store or retrieve information and the quantity of data that is stored on the system. In both types of contracts the common factor is the quantity of data that is stored and the number of times that data is retrieved or accessed.

Competition is very limited as the infrastructure to establish the business is considerable and a pre-requisite is a permanent business contract from a corporate organisation.

2.3 Computer Maintenance Services

ANZSIC defines the computer maintenance services industry as covering three main activities - computer maintenance services (including software maintenance); computer peripheral repair services; and computer repair services.

Industry sources consider that most of the business in computer maintenance services includes both hardware and software. Many of the customers that use maintenance services are small to medium organisations which have a limited number of computers or networks. These systems require regular maintenance or upgrades and speedy service when breakdowns occur.

Large organisations generally offer a combination of services covering both mainframe and PC environments. Since all of these services are packaged, it is often difficult to obtain revenue splits between the separate services. Maintenance companies generally have limited financial resources to establish wide national networks and the natural competitive forces within the industry has tended to force them into regional or local organisations.

Contracts for maintenance services vary between hardware and software. There is normally an annual retention fee along with a call out fee for the first hour, followed by a charge for every extra quarter of an hour. The following are some other features which have an effect on contract prices:

- the service and level of expertise that is required by the project
- the number of hours the project might take to complete
- the number of software programmes required for the project
- whether the project is executed in-house or at the customer's site
- the equipment required to complete the project such as installing emergency replacement Servers or PC's, etc

There is no fixed pricing basis for these services and, in a highly competitive market, service providers will shift their profit margins between hardware and software activities to win a contract. In the experimental price indexes, established for this category, a model pricing basis has been necessary. The

model specifications priced in the sample describe a representative type of job in detail for either on-site or in-house maintenance.

2.4 Computer Consultancy Services

The Computer Consultancy Services class comprises organisations involved in consultancy services in computer related environments. This class consists of units mainly engaged in providing the following services:

(i) computer consultancy service;
(ii) computer programming service;
(iii) software production service (other than mass production); and
(iv) systems analysis service (computer).

These activities are considered by the computer consulting industry as a standard set of services and contract prices depend upon the following:

- the number of days the project takes to complete
- the stage when the project is to be handed over to the customer
- the type and level of technical expertise required
- the number of programmers required
- whether the project is executed in-house or at the customer's site
- the equipment required to complete the project (mainframe, servers or PC), including advice on the selection and configuration of associated hardware
- in some cases contracts are not predominantly either software or hardware consultancies but a combined total IT package (often described as full outsourcing).

Industry sources estimate that more than 80% of the business in consultancy services includes both hardware and software consultancy aspects. A common reason given for this was that most of the vendors offer combined hardware and software products as system solutions. The margins between hardware and software activities shift as business strategies react to high levels of competition.

Recently the Federal Government of Australia established the Office for Government Online (OGO). This organisation's main focus is to provide strategic advice to the government on its information economy and information technology priorities; to raise awareness within the Australian business and general community; and facilitate investment in the information industries. The purpose of OGO was to enable government agencies to maximise their performance through identification, development and promotion of key information management strategies, technologies, tools and infrastructure.

OGO and the consultancy industry have noticed an emerging trend towards the bundling of hardware and software consultancy services into single outsourced contracts. Computer consultancy services include all activities that are associated with PCs, mainframes and networks and their associated systems. Specific

activities include software system development; software and hardware upgrades; hardware installation; maintenance (within warranty terms); on-line help; hardware system architecture design; network installation; systems re-engineering; workflow design; systems integration; and all software / hardware interface implementation.

3. Summary of pricing methodologies

The development of these new service industry price index collections has involved investigating a wide range of diverse industries, which provide a mix of overlapping services, and coping with the consequential complex price measurement problems. Customised approaches to price collection have been used in order to clearly identify the service being priced and to accommodate the flexible contract arrangements offered by service providers. Difficulties have also been encountered in fully identifying and specifying all of the price influencing characteristics of the service actually provided.

This has necessitated extensive consultation with industry associations and individual businesses to determine the most viable approach to pricing. For these and other reasons, the development of the indexes has proven to be very resource intensive, involving a long elapsed time between commencement of the initial desk top research and the actual compilation of useable series.

Pricing details are usually obtained during the first interview with the respondents. The most representative specifications of their services are selected based on the following five characteristics (in the preferred order):

(i) the most revenue earning fee for service ;

(ii) clearly identified and representative specifications are ideal but model pricing of selected revenue earning specifications may be suitable;

(iii) evergreen / ongoing large contracts with a respondent's key clients. Changes in the respondent's customers, however, cause pricing continuity problems. New specifications have to be spliced into the system and any quality change in the service offered needs to be identified;

(iv) average prices may be acceptable where they are calculated across services of a similar type; and

(v) input costs (charge out rates) are not a preferred option but may be necessary where no other data is available. One of the pricing problems is that this measure does not include profits or discounts.

The following table shows the current distribution of the various pricing methods used to date for computing services.

ANZSIC Class **Pricing**	Data Processing	Information Storage	Computer Maintenance	Computer Consultancy
Most revenue earning fee	✓		✓	✓
Model pricing		✓		✓
Evergreen / Ongoing contracts	✓	✓	✓	✓
Average pricing	✓			
Input costs		✓	✓	
Corporate / Government contracts	Corporate	Corporate	Both	Both

4. Specific pricing difficulties

There are a number of inherent difficulties in developing and maintaining price indexes relating to service industries, particularly in relation to the computing industry. It is very difficult to identify and continuously price a fixed basket of services, sold to the same type of customer, under the same conditions. Some of the ongoing difficulties for the computing industry indexes are:-

Repeat Service: It is rare for companies in IT/ Computer industries to repeat precisely the same service to different customers. It is difficult to define a price measure that has a balance between the theoretical ideal and what is practical in the industry.

Adjusting Quality: In more traditional producer price indexes, quality adjustments refer to like-for-like price comparisons when old commodities are replaced by new products. Coping with quality change in goods is easier than handling changes to computer services :-

the pace of technical change in IT/ Computing industries makes quality adjustments quite difficult. For example, it is not a straight forward task to place a value on any technical change in specifications of the service being offered by an IT company particularly where this change is offset against the contract price;

the re-skilling of computer staff (eg, when the latest versions of software or hardware are released) is another area where placing a value on the change in service offered is complex. Such training should presumably result in a higher quality of service;

the quality of staff allocated to a project located at the client 's site. The price paid for such services often depends on the quality of the staff required; and

when an extra service is included in the contract eg. hardware maintenance or training, there is often no price offset against the added service.

Discounts: Because of the complexity and variability of computing contracts, respondents are often tempted to quote standard list prices for single services. Discounts are, in practice, negotiated with individual customers involving the application of varying scales including whether the customer is a regular client, the size and complexity of the job and the expected length of the contract. Work is still continuing to investigate the most appropriate way of accounting for discounted prices in the new services indexes.

5. UK comparisons

5.1 Computer training

The UK price indexes appear to incorporate a separate category for computer education and training. Australian computer industry contacts, however, have confirmed that there is generally no separate fee for implementation training for software or hardware delivery or for systems development projects. Any associated computer training is typically bundled into the overall project price. This sort of implementation training is usually done by the consultant rather than a specialist IT training company and is often an intrinsic part of the final implementation and handover phase of the development rather than discrete training as such. Discrete IT training (not part of a systems development consultancy) is classified to ANZSIC class 8440 Other Education and is treated separately.

5.2 Shrink wrapped software

Australian industry sources agree that the sale of shrink wrapped software (eg. off-the-shelf operating systems and other proprietary software) should be classified to ANZSIC Class 2430 and is consequently out of scope for computer consultancy services. The UK defines shrink wrapped software as software products delivered on CD or Disk.

5.3 Outsourcing

As in the UK, the Australian computer industry has revealed a number of problems with the existing nomenclature. The main problem identified by the UK experience is that the computer companies and industry associations interviewed did not recognise the existing functions in the nomenclature but preferred a different split which allows for 'outsourcing' to be separately identified. Some of the difficult areas mentioned by the industry included

defining a price for 'database activities'. It would not be easy for computer companies to differentiate between hardware consultancy and software consultancy as they are now more likely to produce a contract for a system (hardware and software) or to provide entire facilities on an outsourced basis. Thus a new breakdown is currently being discussed with computer companies and is being used to test whether companies acknowledge this structure and to determine whether they can price products / services on this basis.

The ABS found similar nomenclature problems but has not treated "outsourcing" as a separate service - merely as a complex form of service bundling (bundling occurs in most service sectors and is either decomposed or included in the dominant service category). In one sense, all second party computer servicing is outsourcing and it is largely a question of degree. The ABS does not try to decompose computer consultancy activities as contracts often cover both hardware and software. The ABS has tried to incorporate outsourcing into the existing classification structure (at a higher ANZSIC level). Consultancy services includes any activity associated with software development, systems design (software / hardware), implementation and ongoing maintenance.

Discussions topics:

ABS believes that there are many aspects of service industries surveys which need further consideration. Of particular importance and issues related to computer industries are:

- how to treat the bundling of services (outsourcing);
- the need to map classifications to the industry definitions; and
- the measurement of non market computer services sector relating to computing activity carried out as an in-house activity in many government agencies and businesses. The exclusion of this activity will distort the measured growth in computer services as the utilisation of outsourcing increases.

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