

# A price index for computer services

## The French experiment

*Benoît Buisson*

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*INSEE*

FRANCE



## I) Business model

In France, the computer services sector comprises 28,500 companies and employs 270,000 people. The turnover is more than 31 billion euros. This sector represents one company in ten in services and 14% of the value added. The sector is concentrated and is becoming increasingly so: 1% of the companies make half of the turnover. However, 80% of companies have fewer than 10 employees. Some of the computer service companies have only one client. Most often, it is because an existing company has outsourced the IT department.

The economic climate in computer services was very good between 1999 and the first half of 2001. The main reasons for this are the good overall economic situation that is favourable to IT projects, the strong growth in internet-related technology and the transition to the euro. Since mid-2001, there has been a slight slow-down in the economic situation in line with the economic climate worldwide. Computer services seem to be particularly sensitive to a turnaround in the economy. There are clearly fewer IT projects in periods of depressed economic growth. This is why price trends in this sector can be an advanced economic indicator.

The computer services industry consists of five subgroups according to the CPF classification:

- **computer consultancy** (31 % of turnover).

This subgroup covers studies and consultation work on hardware and software for computer systems.

- **software development** (43 % of turnover)

Software development includes services in the development, production, provision and documentation of standard software (software packages) or customised software. Consultancy services (in software development) and following up applications (including maintenance) also belong to this subgroup. On the other hand, the duplication of software packages is classified in "publishing".

- **data processing** (19 % of turnover)

In addition to data processing itself, this subgroup includes data capture, the provision of equipment (including website address) and computer networks or backup. These various aspects of resource availability are a matter for facilities management.

- **data base activities** (2 % of turnover).

This involves providing existing data on various media.

- **maintenance, repairs**, (5 %)

This last subgroup includes hardware maintenance but also the maintenance and repair of office equipment (photocopier for example).

## II) Which classification is used to measure the evolution of prices in the computer services sector ?

The classification used for price collecting must satisfy three objectives :

- a) **it must be easily transposable to the official classification**
- b) **it must be relevant to the market and therefore understood by people in the industry.**

Our contacts in the companies must be able to break down their company turnover using this classification.

After talking this over with people in the industry at test visits, it would appear that the official CPF classification is not completely suitable for the computer service sector. The main reasons mentioned are:



\* services are increasingly global, in a lot of cases it is difficult to separate them out into their components. In particular, it is tricky to separate aspects relating purely to software from other aspects. For example, in some cases it is very difficult to split "computer consultancy" from "software development".

\* the subgroups are different sizes: for example, it is surely unnecessary to differentiate a "data base activities" subgroup. Furthermore, data base activities and data processing can overlap to a great extent.

\* the "data processing" branch covers very different activities. Facilities management (managing computer equipment for third parties) has nothing to do with data capture.

c) **it must be in line with price fixing methods** and, in particular, with price trends in the profession.

Particular care should be taken not to make categories too mixed in relation to the method of price fixing: (note: it is difficult, before the survey, to know price trends per sub-group so the calculation tends to be in relation to the price fixing method). Where this objective is concerned, it is better to have too many sub-groups than too few. However, companies must be able to break down their turnover. As we will see in the next section, there seem to be two major types of pricing methods used by companies in consultation, engineering and software development: a set price (price for an entire contract when the computer engineering and maintenance company is project manager) and price per day and per qualification (technical assistance usually on the client's site).

In practical terms, these three objectives cannot be completely reconciled.

The first version of the classification presented below is largely the result of test visits to companies and international experience on the subject.

This classification for collection consists of eight main items:

**item 1 : consultancy, studies, systems integration, in terms of an information system project.**

**item 2 : technical assistance**

**item 3 : software packages**

**item 4 : software maintenance (Third Party Application Maintenance)**

**item 5 : facilities management**

**item 6 : data entry, image capture and tabulating services**

**item 7 : data base activities**

**item 8 : maintenance and repairs, hardware maintenance**

**The main difficulty lies in delimiting items 1 and 2, or (which comes to the same thing) defining a new classification for the items of computer consultancy and software development.** Several remarks can be made, in relation to the CPF nomenclature:

- Item 1 comes close to "computer configuration consultancy" although it does not cover it completely as the CPF distinguishes software consultancy which is part of the Software development item.

- The difference between items 1 and 2 is based on the fact that in case 1 the computer engineering and maintenance company is project manager, and in case 2 the client is the project manager. Item 2 can be assimilated into "computer temporary work". This seems to be the most important item. Only a few large companies can be placed entirely in item 1. For the transition to CPF, item 2 should preferably be moved closer to the "software development" item although it still does not cover it completely.

- There do not seem to be too many problems in defining items 3 to 8 and relating them to the CPF. Item 3 refers to "software development"; likewise item 4; items 5 and 6 to "data processing"; item 7 to "data base activities"; item 8 to the "maintenance and repairs" subgroup.

- We have created a second classification relating to the client's sector of industry. This is normal practice in the profession.



The following sections only concern items 1, 2 and 6 of the previous classification.

### **III) Price fixing method**

#### **a) data entry, image capture and tabulating services (item 6)**

In most cases, the computer services company sets out in a contract a unit retail price (example, cost of processing a cheque). The contract price is therefore this unit price multiplied by a volume (number of cheques to be processed over a period). The unit price mainly depends on the following factors:

- wage bill (salary and contributions) for the people assigned to do the work
- overheads and running costs
- cost of machinery, depending on machinery requested
- type of restitution required (paper, CD ROM...)
- volume of the contract
- length of the contract
- time of year and month the work needs to be done
- mark-up over costs
- negotiation

In some cases, when the company is in a specific type of work, costs of elementary jobs are defined generally in relation to the company's experience. Likewise, the unit price can sometimes be replaced by a price per "unit of time". The contract price will therefore be this price multiplied by the time spent.

Even though the contract price depends on several criteria, this price cannot always be broken down in relation to these criteria. To the client, the contract price seems "global" and cannot be broken up.

The price of a long-term contract is revised every year on the date the contract was drawn up. In most cases, the contract is revised on the basis of the SYNTEC index (index of salary costs published by the association of professionals), although there is a negotiating period. In the first year, the revision may be considerable owing to a bad evaluation of the volume or time spent, for example.

#### **b) technical assistance and computer projects (items 1 and 2)**

The same method of pricing is used for consultancy work, engineering, and integration as part of a computer project on the one hand, and for technical assistance on the other. We refer to fixed price (a set price) for a project and price per day for technical assistance.

In the context of a computer project, the computer company firstly fixes **the salary cost price of the project**. This corresponds to the salaries and contributions of staff assigned to the project and takes into account the (estimated) time spent by each person on the project. Obviously, the estimated time spent (from the point of view of specifications) is an important factor which makes it difficult for computer companies to invoice a fixed price. The other direct charges of the project, such as travelling expenses and logistics costs, have to be added to the salary cost price. Finally, to find the cost of the project, the computer engineering and maintenance company includes a share of the other charges to assign to the project. These other charges are, for example, infrastructure charges (rent on the premises used), the salaries and contributions of staff who are "non-productive" in terms of the project (particularly administrative staff) as well as valuation of the "non-productive" time of the productive staff (training, for example). To determine this share, the company multiplies the salary cost price by a coefficient. This coefficient is recalculated every year. Thus, the cost of a project can be written:

$$Cost = \left( \sum_i (s_i + c_i) \times tp^e_i \right) + ACD + QPAC$$



$$Cost = \left( \sum_i (s_i + c_i) \times tp_i^e \right) * (1 + COEF) + ACD$$

with the following notations:

s : salary, c : employers' contributions

tp<sup>e</sup> : time spent (estimated)

i : individual taking part in a project

ACD : other direct charges of a project

QPAC : share of other charges

COEF : coefficient for determining the share of other charges

Moving on to the sale price of the project, the computer company applies a profit coefficient (called M) and a risk coefficient (called R). The risk coefficient is fixed after reading the specifications and also depends on the client's reputation. This coefficient is intended to allow for uncertainty about the estimated time spent on the project. Of course, negotiations will focus on the profit coefficient. We refer to set price invoicing as the client pays a set price without knowing how this fixed price is broken down.

**The price of a project can be written thus :**

$$Price = \left[ \left( \sum_i (s_i + c_i) \times tp_i^e \right) * (1 + COEF) + ACD \right] \times (1 + M) \times (1 + R)$$

**With regard to technical assistance, the method of pricing is similar although much simpler :**

- there are fewer people involved
- prices are set per participant
- the time spent is not estimated but actually worked in the company (commitment of resources)
- the other direct charges are limited
- no coefficient for risk is applied

The price per day per person employed represents mainly and almost exclusively the salaries and contributions of the person employed and the coefficients COEF and M.

Technical assistance is therefore rather like the delegation of staff, computer service companies invoice company clients for their fees per day by type of qualification.

**The practice of recommendation is quite common in the profession.** Computer service companies are recommended to a certain number of clients who have recourse to them as required. In this case, the prices by qualification are specified in an outline agreement between the client and the computer service company. This is a daily rate per category of qualification depending on the client's scale. The rates in the outline agreements are reviewed annually. In theory, the annual adjustment is made using the SYNTEC index: however, the two parties do sometimes renegotiate the adjustment method.

#### **IV) Pricing methodologies and their limitations**

##### **a) data entry, image capture and tabulating services (item 6)**

As clients and services seem to recur, **the preferred method is to track recurrent contracts.** Efforts should be made in advance to ensure that these client contracts are long-term and that they will not alter over time. From this point of view, we are more interested in recurring services than in the clients who keep cropping up. Clients who change the service they want every year should be avoided. We have to measure a price effect and not a change of service effect. If the service



changes, one must ensure that the company can evaluate the price effect and the change of service effect. If there is any doubt about whether it is a recurring service, it may be necessary to specify this service (not just the client) and the amount processed. If possible, and this may prove difficult, a price for "computer services" only, apart from routing, should be measured. In fact, in most cases, the service supplied does not just involve computing aspects. We can measure an overall price if this is not possible with the company's management system.

If this method is not feasible, because the company only provides non-recurrent services, for example, **several alternative methods are possible** :

- **take average prices** per type of service and, possibly, by category of client,
- take list unit prices, by type of service
- in the case of non-recurrent contracts, possibility of taking the coefficient for annually updating a contract.

#### **b) technical assistance and computer projects (items 1 and 2)**

The objective of the method is two-fold: **to monitor transaction price and to monitor prices every three months.**

Prices must be monitored every three months especially as it appears from test visits that prices in this branch are very sensitive to the economic situation. Price trends in computer services could therefore be an advanced indicator of the economic situation.

It can seem "easy" to monitor daily prices by qualification. However, the difficulty here lies in monitoring transaction prices and not catalogue list prices.

**There are several possible alternatives (which should be tested by companies) for monitoring daily transaction prices by qualification:**

- in the case of important clients, it is possible to calculate every three months, on average, by qualification. One should ensure that the prices are transaction prices and not list prices set out in the outline agreements.

- it is possible to calculate taking all clients into account, segmenting according to the client's geographical location (Paris/provinces difference) and the size of the client (a distinction made between large accounts and other companies by several computer engineering and maintenance companies).

- for the smallest companies, it is possible to calculate by qualification, regardless of client.

- failing this, it is also possible to calculate, taking all qualifications into account. This approach has its limitations because there may be a structural effect after qualifications increase over the years. The qualification approach also has a flaw. In some circumstances (particularly when the economic climate is good), there is the danger of over-qualification: computer service companies invoice for a senior consultant when a junior consultant has done the work.

As a last resort (for example, when the mark-ups method proves impossible to use), list prices may be measured. These are naturally only changed once a year, usually at the start of the calendar year. When monitoring list prices, it is preferable to measure for a given client (in the case of outline agreements) rather than for all clients (the price depending on the client for the same qualification). The method of "monitoring catalogue prices for a given qualification, all clients taken together" is naturally the one with the most drawbacks.

Computer companies regularly measure and monitor **profit indicators**. This type of indicator needs to be monitored because each project is unique and it is difficult to estimate the time spent prior to a project. This type of indicator can be used to develop an alternative method to the previous one.

One of the main points will be to define the notion of mark-up. Although the definition is not always consistent, the idea is **that the mark-up is the ratio price of a project to the value of its internal cost**. In all cases, components related to labour are by far the most important ones in mark-up.



It is important to note that the numerator (price) takes account of the time invoiced per person, whilst the denominator (cost) takes the time actually spent into account. In the case of technical assistance, these two factors are the same, in the case of projects there is no reason why they should be equal.

In computer service companies, the mark-up is traditionally calculated per project and/or per client. It is also generally available for the company. In some cases, it is calculated per group and/or per sub-group of industry.

**In the opinion of many whom we spoke to in computer services, trends in mark-ups are a good indication of price trends.** The great advantage of the mark-up is that it measures aspects related to markets and transactions.

**The approach using mark up must include an approach using wage bills and rate of activity.**

Let's suppose that client A calls a computer service company asking for a programme analyst in quarter T. The computer services company invoices for this analyst by the day 110, the wage bill is 100, the mark-up 10. In quarter T + 1, the wage bill goes up to 110, if the mark-up is held at 10, the price by the day is 121. Following profit levels only would conclude to price stability.

At the same time as the profit level, it is important to ask for an indicator related to the company's wage bill every quarter. In this way, requests can be made about trends in the company's wage bill. The wage bill can be calculated using only the productive staff, given the method of price fixing. If this is possible, the trend in wage bill should preferably be calculated with the same qualification. An increase in qualifications can be assimilated to a quality effect on the type of services supplied. To do this, one solution is to calculate using only the people present in quarters T and T+1, and whose qualifications have not changed. As quarters go by, we can calculate the indices with the chaining and resampling method. However, monitoring the wage bill as an indicator of wage bills applying in computer services is not sufficient. This wage bill refers to people who have been involved in a computer service during the period in question, taking the time they have spent on projects into account. The wage bill (even when only the productive staff are considered) puts a figure on any person, in relation to the time he is there, whether this person is working on a project or not (they may be "jobless" because of a downturn in the economic situation). It is therefore important to adjust the wage bill according to the rate of activity. The rate of activity is readily available in computer engineering and maintenance companies, it is an indicator that is often checked and commented upon.

**We can therefore approach price trends by measuring trends in the product of mark-up\* wage bill (if possible with qualifications staying the same) \* rate of activity.**

In theory, one should also take into account the trends in costs other than salaries and contributions which are linked to the sales price. However, as costs are mostly made up of labour costs, monitoring the wage bill only should not pose too many problems.

Likewise, a complete approach ought to take productivity trends into account. In the opinion of all the people we spoke to in business, it is very difficult to get an idea of, still less measure, productivity trends.

We have not finished to build this alternative method. The investigation will continue. We want to improve this approach as a proxy for measuring the evolution of price

**We must choose for each company between an approach of the "average transaction price per qualification" type and an approach based on mark-up.**



The main criterion when making this choice may be the need to monitor a transaction price. If transaction prices cannot be monitored using the daily rates per qualification approach, an approach using mark-up and wage bill must be followed.

If transaction prices can be followed using the two approaches, the second criterion may be the contribution of technical assistance for the company. The smaller the contribution (large companies, in particular), the greater the need to favour an approach by mark-up. For small and medium-sized businesses that mainly provide technical assistance, an approach using daily rates by qualification may prove effective.

## **SUMMARY**

**One of the main difficulties found in computer services is the definition of a classification that is understood by those in the industry and is relevant in relation to price fixing methods. With regard to the CPF classification, it has been necessary to redefine what the items "computer consultancy" and "software development" consist of. The classification that has been adopted is not perfect and may be improved as time goes on. The method of price fixing in computer services does not seem too complex. The prices are firstly fixed in relation to a cost analysis, mainly of wages. The majority of services are invoiced on the basis of a daily rate and the qualification required. The method for measuring the evolution of prices can therefore be based on transaction prices per day and per qualification. This approach has its limitations when companies fix a set price, i.e. when they are project managers. In this case, when large companies are mainly involved, an alternative method has been designed: price trends are approached by measuring trends in the product of: mark up\* wage bill \* level of employment. But the investigations about this method are not finished, we want to improve this methodology.**

