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*NEW VERSION*

**COMPUTERIZATION AND CHANGES IN FIRM ORGANIZATION :**

**A SURVEY ON ACCOUNTING SERVICES INDUSTRIES**

*by*

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**SESSION 3**



## **1. Survey objectives and methodology**

The survey presented here belongs to a group of four surveys organized in two sections.

The first section groups three firm surveys : the present survey, which concerns accounting services industries, another one dealing with manufacturing industries and the last one dealing with food-processing industries. Those surveys aim at clarifying the links between computerization and work organization. They observe the characteristics of present work organization and computerization and their recent changes (by comparing the 1997 situation to the 1994 one).

The three surveys could use an identical questionnaire. Actually, the two last ones do. But in fact, we rapidly realized that the specificity of accounting services industries required adaptations. For instance, they were, more than manufacturing industries, to be questioned about networks and types of pricing. We knew indeed that complex and flexible type of networks, with typical structures and organizations which differed from the manufacturers' subcontracting, existed in this sector. On the other hand, types of pricing are more varied than in manufacturing activities, according to the more complex types of "products" in services industries. For the same reasons, it is more interesting to put an accent on relationship with customers, which are essential in services industries, than on contacts with suppliers. But as far as possible, the questions were kept in both questionnaires when they made sense for all, in order to allow sector-based comparisons.

The second section of the group of surveys is more original, at least in its links with the first one. It is made up of an individual phone survey, addressed to a sub-sample of employees of firms surveyed in the first section. It aims at understanding the effects of work organization and use of computers on the employees themselves : workplaces, earnings. Merging the two sections will allow to combine the firm and employee points of view. For instance, it will be possible to build firm indicators from employees' responses or, vice versa, to situate the employees' analysis in the firm context.

Moreover, another approach will be feasible by linking changes in organization and computerization to existing information in structural surveys or administrative files, about firm investment, remuneration behavior, hardware and software expenses, or general performances.

This original system involved four different statistical units : INSEE for the present survey, the statistical departments of the Ministries of Labour, Agriculture, and Manufacturing Industries, who shared their skills and knowledge. At present, the first step is fulfilled, as each of the four surveys are completed or finishing. Separate results will be first published and the common processing will begin afterwards, by the end of 1998.

Though previous surveys on organizational changes have been carried out for agricultural and manufacturing industries, there was no prior experience in services industries. That is why the survey has been limited to a single activity. In accounting services industries, on one hand, the importance of computerization and special forms of inter firms organization was known. On the other hand, employers' organizations were interested in the project and fully participated in the survey preparation.

So the accounting services survey was a full-size experience that could be renewed later or elsewhere on other services industries. That is why it is particularly interesting to learn complete lessons from this attempt. I'll present here an early evaluation (*see also annex I*).

## 2. Preliminary results

Accounting services industries, ruled by an Accounting Association, include different activities, among which keeping the accounts, auditorship, and tax advise. It's a sector of small sized firms : in 1996, about one quarter of the accounting firms were composed of one self-employed alone. Less than 7 % had more than 20 employees, even if they represent about 30 % of the total turnover of the sector. The biggest firms (100 employees ore more), represent 0.5 % of the total number of accounting firms and about 20 % of employees and turnover.

### 2.1. Almost all accounting firms have computers

First of all, almost all accounting firms have computers at their disposal in 1997, since about 1 % of them don't tick any hardware, nor any software in the list (*see tables 1 & 2*). In all, 8 firms only have declared neither hardware, nor software at their disposal. Two of them were working with computing services providers. For the other ones, non response seem to appear in many questions, so quality of the questionnaires is in doubt. The computerization was largely realized in 1994, as the figures are rather similar. This result is not a surprise, since the accounting services industries were precisely chosen because the use of computers was thought to be massive in that activity.

Table 1. Available hardware by firm size

| Available hardware<br>(equipment rate, %)              | Year | Number of employees |      |       |       |       | Total |
|--|------|---------------------|------|-------|-------|-------|-------|
|  |      | <5                  | 5-9  | 10-19 | 20-99 | >99   |       |
| Desktop micro computers,<br>not connected to a network | 1997 | 67.2                | 42.1 | 49.2  | 50.1  | 50.9  | 56.9  |
|  | 1994 | 66.4                | 51.2 | 47.8  | 59.3  | 69.8  | 59.6  |
| Desktop micro computers,<br>connected to a network     | 1997 | 36.4                | 65.7 | 67.8  | 77.0  | 90.6  | 51.5  |
|  | 1994 | 18.2*               | 39.3 | 41.5  | 40.2  | 43.4  | 28.5  |
| Portable, not connectable<br>micro computers           | 1997 | 33.2                | 30.9 | 38.1  | 41.1  | 39.6  | 33.8  |
|  | 1994 | 18.2*               | 25.4 | 23.6  | 37.9  | 56.6  | 22.6  |
| Portable, connectable<br>micro computers               | 1997 | 26.3                | 41.2 | 53.4  | 60.3  | 86.8  | 36.6  |
|  | 1994 | 8.4*                | 16.5 | 20.6  | 21.8  | 41.5  | 13.3  |
| Minicomputer   | 1997 | 20.5*               | 19.4 | 37.9  | 38.1  | 47.2  | 23.9  |
|  | 1994 | 19.2*               | 19.0 | 40.8  | 37.8  | 43.4  | 23.4  |
| Mainframe computer                                     | 1997 | 3.5*                | 9.4* | 16.3  | 18.1  | 24.5* | 7.9   |
|  | 1994 | 2.9*                | 8.0* | 11.6* | 17.7  | 22.6* | 6.6   |
| Neither minicomputer,<br>nor mainframe                 | 1997 | 76.8                | 75.0 | 52.8  | 51.7  | 39.6  | 71.2  |
|  | 1994 | 78.1                | 75.0 | 53.5  | 51.4  | 41.5  | 72.0  |
| Non response to every item                             | 1997 | 1.3                 | 1.8  | 0     | 0.3   | 0     | 1.2   |
|  | 1994 | 3.5                 | 6.1  | 2.4   | 3.0   | 1.9   | 4.0   |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

More interesting are the figures about the categories of available hardware. The first break between firms lies in the exclusive use of micro computers : it is the case of 71 % of firms in 1997 and 72 % in 1994. The absence of mainframes or minicomputers is more and more frequent as the firm size is smaller, and only 40 % of the biggest firms declare that they do not use such hardware.

During the last 3 years, the mini or mainframe equipment rate has practically not changed. However, it seems that mainframe computer use has slightly increased since 1994 (6.6 % to 7.9 % for all sizes). In 1997, almost a quarter of firms used minicomputers.

As far as micro computers are concerned, almost every firm (more than 93 % in all) declare to own at least one of the 4 categories quoted in the questionnaire (desktop or not, connectable to a network or not). Of course, all the big firms use them, and their presence has greatly increased in small firms since 1994 : the equipment rate increased from ten to thirteen points depending on firm sizes. Technical advances in computer science have greatly determined the recent evolution : from desktop to portable computers, from non connectable to connectable ones. The use of connected desktop micro computers almost doubled in 3 years : from 28.5 % in 1994 to 51.5 in 1997. That type of hardware is above all the privilege of big firms : above 99 employees, the equipment rate overtakes 90 %, while it is only 36 % in the smallest ones. The portable and connectable microcomputers, rare in 1994, have tripled in 3 years : they are present in 37 % of the firms and in nearly 90 % of the biggest. In all, portable computers were used in one third of the accounting firms, and in three quarters of the biggest in 1994. They are available in 61 % of the firms in 1997 and in 92 % of the biggest.

## 2.2. Software portfolio : general and current professional first

In 1997, more than 98 % of the firms ticked at least one software type in the proposed list (*see table 2*). The use of specific software dedicated to accounting processes is also quasi universal (almost 98 % of the firms have ticked one of the different categories in the list). The use of general software (dedicated to internal management or office automation) is, of course, quite general (88 % ticked at least one of the two categories, and it is the case of almost all the firms above 9 employees).

Table 2. Available software by firm size

| Available software<br>(equipment rate, %)           | Year | Number of employees |      |       |       |      | Total |
|---|------|---------------------|------|-------|-------|------|-------|
|   |      | <5                  | 5-9  | 10-19 | 20-99 | >99  |       |
| Accounting production                               | 1997 | 91.1                | 93.4 | 94.0  | 95.8  | 94.3 | 92.5  |
|   | 1994 | 87.2                | 88.6 | 91.3  | 91.7  | 92.5 | 88.4  |
| Check of accounts                                   | 1997 | 43.8                | 52.2 | 60.6  | 60.3  | 66.0 | 49.5  |
|   | 1994 | 31.8                | 35.8 | 42.2  | 39.4  | 45.3 | 34.8  |
| Financial statements<br>production (tax return,...) | 1997 | 84.9                | 92.6 | 96.6  | 97.3  | 94.3 | 89.4  |
|   | 1994 | 75.8                | 84.2 | 94.6  | 92.1  | 90.6 | 81.7  |
| Payroll production                                  | 1997 | 87.6                | 95.6 | 99.0  | 95.3  | 90.6 | 91.7  |
|   | 1994 | 81.4                | 87.3 | 94.7  | 89.5  | 84.9 | 85.3  |
| Consulting help                                     | 1997 | 30.2                | 43.8 | 56.6  | 58.6  | 71.7 | 39.5  |
|   | 1994 | 19.9*               | 26.1 | 35.5  | 38.1  | 52.8 | 25.1  |
| Internal management                                 | 1997 | 45.2                | 70.0 | 83.6  | 89.1  | 96.2 | 60.2  |
|   | 1994 | 36.7                | 58.2 | 76.1  | 78.2  | 90.6 | 50.8  |
| Office automation (word<br>processing,...)          | 1997 | 83.6                | 84.5 | 95.5  | 91.4  | 100  | 86.0  |
|   | 1994 | 70.9                | 72.5 | 78.4  | 77.7  | 94.3 | 72.9  |
| None of those                                       | 1997 | 2.3                 | 1.3  | 0     | 1.0   | 0    | 1.6   |
|   | 1994 | 7.1                 | 6.6  | 2.6   | 4.2   | 1.9  | 6.2   |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

As the composition of hardware reflected partly technical advances in computers, the composition of software portfolio reflects progress in software specialization, but reveals also firm specialization. Basic software, which corresponds to the core of the accounting activity (accounting production, financial statements production, payroll production) is widespread (90 % or more). Its use was very common in 1994, but an extension can be noticed among small firms during the 3 years. Software dedicated to auditing and consulting activities is less common, though in strong progress : almost half of the population used checking of accounts software in 1997, versus 35 % in 1994. As far as consulting help software is concerned, 40 % used it in 1997 versus 25 % in 1994. Moreover, the use of those software categories is strongly correlated to size : biggest firms use them about two times more often than smallest ones, and the size gap is more important in 1997.

### 2.3. The practice of computing is rapidly changing

The survey was a good opportunity to count internet users among the accounting firms. To clarify the question, 4 functions were separated : e-mail, file exchange, provision of web pages and reference to databases (*see table 3*). In all, 18 % of the firms, and 64 % of the 100 employees or more, ticked at least one of these uses. Firm size effect is very clear for every type of use : generally the biggest firms (100 employees or more) use the internet 4 times more than the smallest (1 to 4 employees). Only one category of use must be distinguished : creation of web pages is much less frequent than other types of uses of the internet. The reason is double : first, such creation requires specific skills that are probably less frequent in accounting firms than capacities of using e-mail or consulting databases. Secondly, accountants' occupational code of ethics forbids advertising, and consequently some of them consider web pages as prohibited.

Table 3. The internet use by firm size

| Internet use<br>( % )         | Year | Number of employees |       |       |       |       | Total |
|-------------------------------|------|---------------------|-------|-------|-------|-------|-------|
|                               |      | <5                  | 5-9   | 10-19 | 20-99 | >99   |       |
| ... for mail                  | 1997 | 10.6*               | 16.1* | 13.3* | 22.1  | 39.6  | 13.5  |
| ... to send or receive files  | 1997 | 11.5*               | 13.6  | 10.4* | 20.4  | 45.3* | 12.8  |
| ... to provide information    | 1997 | 1.3*                | 3.5*  | 3.0*  | 7.3*  | 26.4* | 2.8   |
| ... to refer to a database    | 1997 | 10.0*               | 10.9  | 15.0  | 23.7  | 43.4  | 12.2  |
| ... for one of these at least | 1997 | 14.0*               | 20.1  | 18.6  | 32.9  | 64.1  | 18.0  |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

Some characteristic computer-based practices were also listed in a complementary question. Internal mails appear less frequently used than the internet e-mail (*see table 4*). Users are 8.2 % in all, but 55 % for the biggest firms, where the difficulties of direct communication are higher and connected computers are more common. If internet and internal mail are gathered, 17.5 % of the firms appear to use one or another type of e-mail. Of course, size effect remains important : less than 20 % of firms under 20 employees are among the users, about 30 % among the 20-99 employees and 66 % among the 100 and more.

CD-ROM documentation is much more ordinary : it concerns 44.5 % of the firms in all, from 36 % of the 1-4 employees to 74 % of 100 and more. The existence of an internal documentary data base is shared by 23.4 % of the firms, and 47 % of the biggest. Organized file storing is not yet a current practice (28.5 %), even for the biggest firms (about 40 %). Marketing oriented file of customers are used by two thirds of the biggest firms, but less than a quarter of the smallest ones (28.5 % in all). So it appears that if using a professional software is general, more advanced

techniques and complete integration of computing potential in the current work organization is not so expanded.

Table 4. Some computing practices by firm size

| Use of...<br>(%)                         | Year | Number of employees |      |       |       |      |       |
|--|------|---------------------|------|-------|-------|------|-------|
|  |      | <5                  | 5-9  | 10-19 | 20-99 | >99  | Total |
| ... intranet or internal mail            | 1997 | 6.9*                | 6.6* | 8.4*  | 17.7  | 54.7 | 8.2   |
| ... CD-ROM documentation                 | 1997 | 36.4                | 47.1 | 60.2  | 63.2  | 73.6 | 44.5  |
| ... organized file storing               | 1997 | 24.2                | 27.0 | 40.1  | 36.9  | 39.6 | 28.0  |
| ... marketing oriented file of customers | 1997 | 22.3                | 31.0 | 37.4  | 44.7  | 67.9 | 28.5  |
| ... internal documentary database        | 1997 | 18.3*               | 29.0 | 25.7  | 32.8  | 47.2 | 23.4  |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

Even if the hardware availability has not considerably progressed since 1994, the way of computing changed largely. For instance, the practice of direct data transfers between the firm and its external partners has considerably increased since 1994. At that date, 29 % of the accounting firms were directly sending or receiving files from outside the firm (*see table 5*). In 1997, they were nearly 56 %, and 91 % of the biggest firms. The frequency of data transmission almost doubled for every firm size during these 3 years. In 1997 as in 1994, the most common partners for data transmission are public authorities (22.2 % in 1994 and 46.2 % in 1997, more than two thirds of firms of more than ten employees concerned at that date). Services providers, and among them probably computing services firms, represented in 1997 the second partner, with 18.5 % of the firms concerned, versus 8.6 % in 1994 (38 % of the 100 employees or more). Customers are providers or addressees in 16.3 % cases, versus 6.1 % in 1994 (almost one third of firms employing 20 persons or more are concerned). Other types of partners (networks, for instance) and detailed information on the contents of transfers cannot be given from the survey, for the firms concerned are too few.

Table 5. Data exchanges with different partners

| Existence of ...<br>(%)   | Year | Number of employees |      |       |       |       |       |
|---|------|---------------------|------|-------|-------|-------|-------|
|   |      | <5                  | 5-9  | 10-19 | 20-99 | >99   | Total |
| ... data exchanges with customers                                     | 1997 | 11.1*               | 18.6 | 24.0  | 30.0  | 30.2* | 16.3  |
|   | 1994 | 4.9*                | 6.0* | 8.0*  | 10.8  | 18.9* | 6.1   |
| ... data transmission to/from<br>services providers                   | 1997 | 13.8*               | 20.6 | 27.2  | 27.6  | 37.7  | 18.5  |
|   | 1994 | 4.0*                | 11.8 | 16.9  | 14.9  | 15.1* | 8.6   |
| ... data transmission to/from<br>tax and other public authorities     | 1997 | 34.1                | 49.7 | 73.3  | 72.0  | 67.9  | 46.2  |
|   | 1994 | 10.6                | 33.6 | 41.3  | 31.8  | 18.9* | 22.2  |
| ... data transmission to/from<br>banking establishment                | 1997 | 2.7*                | 12.0 | 20.5  | 28.6  | 62.3  | 9.7   |
|   | 1994 | 0.4*                | 2.7* | 8.1*  | 10.6  | 30.2* | 3.0   |
| at last one type of data exchange<br>with customers or other partners | 1997 | 43.4                | 60.1 | 79.8  | 81.3  | 90.6  | 55.5  |
|   | 1994 | 16.8*               | 37.9 | 50.7  | 45.6  | 52.8  | 29.0  |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

## 2.4. Internal and external computing organization

The extent of computer use in accounting activity requires often, and more often as time passes, the presence of a specialist within the firm. Thus in 1997 35 % of the firms employ at least one person for at least one third of time on computing, telecommunication or networks tasks. They

were 20 % in 1994. Of course, it is the case of a majority of big firms, and the presence of such a specialist increases with firm size ; but furthermore, about 30 % of the smallest ones are also concerned and their share doubled between 1994 and 1997.

14 % declared that this function (or a part of it) is externalized in 1997, to a network or a computing services provider. In this case too, the frequency of externalization increases with firm size. It ranges from about 9 % of the smallest firms to 32 % for the biggest ones. Subcontractors are more or less involved in all aspects of computer use. In 48 % cases, they are required for training. In 37 % cases, they assume or participate to computing maintenance and management. As external training doesn't varies considerably with firm size, the participation to maintenance and management is more frequent as size decreases (34 % for 1-4 employees firms to 26 % for 100 or more). Computing services firms provide technical aid for 11 %, and more for the biggest (26 % for 100 employees or more). They are sometimes involved in hardware or software choices (7 % for each). Though the services providers are not more often requested to select hardware for the different firm sizes, biggest firms involve them in software choice or design much more frequently (23 % for 100 employees or more, versus 5 % for less than 5). In 18 % cases, firm belongs to a computing users club (from 14 % of the 1-4 employees to 34 % of the 100 or more).

Sharing out responsibilities about computing is of course very dependent on firm size. Managers are naturally involved in decisions about hardware and software choice : 92,7 % on hardware and 83.4 % on software (*see table 6*). The managers' involvement is nevertheless different for the biggest firms, where technical choices can be more easily delegated to specialists : in firms of 100 employees or more, only three quarters of managers are implied in such choices. In those firms, in about 81 % cases for hardware, and 70 % for software, a computer manager can assume or share the decision ( 15 % and 14 % respectively for all sizes of firms). In small firms, the manager takes also very currently the responsibility of system maintenance (57 % of firms with 1 to 4 employees, about 41 % between 5 and 19), and even of users' assistance and training. In the biggest firms, those two last responsibilities are practically always assumed by somebody of an intermediate level or by an external contributor. In firms of any size, computing services providers are rarely responsible of hardware choice (6.8 %), a little more frequently in software choices (15.6 %). Their responsibilities areas are above all maintenance (36.7 % of the firms are concerned), users' assistance (38.2 %) and training (48.2 %). Computer users are not much implied in those choices and tasks, except for – mutual– assistance (11.4 %), and the role of users' clubs or working groups is still less perceptible concerning those functions. Nevertheless, 62.3 % of firms (74 % of the biggest ones) declare that the staff has been informed and consulted about general projects concerning computing organization.

Table 6. Managers responsibilities about computing

| Responsibility of ...<br>( % ) | Year<br>(*) | Number of employees |      |       |       |      | Total |
|--------------------------------|-------------|---------------------|------|-------|-------|------|-------|
|                                |             | <5                  | 5-9  | 10-19 | 20-99 | >99  |       |
| ... hardware choice            | 1997        | 93.8                | 90.2 | 95.7  | 91.0  | 75.5 | 92.7  |
| ... software design or choice  | 1997        | 85.3                | 78.8 | 86.1  | 82.6  | 73.6 | 83.4  |
| ... system maintenance         | 1997        | 57.1                | 41.3 | 41.7  | 34.1  | 26.4 | 49.0  |
| ... users' assistance          | 1997        | 51.0                | 34.4 | 32.1  | 21.6  | 7.6* | 41.7  |
| ... users' training            | 1997        | 56.8                | 29.3 | 29.3  | 20.3  | 9.4* | 42.9  |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

As noticed before, the information on the time share of the work done with a computer lacks quality because of non response. Yet an attempt can be made in order to interpret the answers, either



on raw data or by assuming that non response is 0. As the respondent is generally a member of management staff, the estimations concerning managers are suffering less non response than those relative to staff members or secretarial and administrative staff. Managers' mean time spent working with a computer is around a third of their time in firm's office, about 12-16 % at customer's office and 3-5 % at home. Differences between firm sizes are not very marked. Yet it seems that in very small firms, managers are a little more implied than in big ones, in every circumstance. Half of the responses estimate that managers spent less than a quarter of time computing in firm's office and 10 % at customers' office. More than a half don't consider that they work on computers at home. But of course, all the range of possibilities is hold in the sample, from 0 to 100%...

The category of employees spending most time working with computers in firm premises is secretarial and administrative task. Depending on the interpretation of non response, that tasks represent in average 58 to 71 % of working time for them. But apart from exception, they don't work at home or at customers' office. As far as other members of staff are concerned, they are in a median position by spending in average 52 to 57 % of their time computing in firm premises. As the average time spent computing at customers' office is between 12 and 17 %, computers use up a large part of working time for them...

But probably the space taken by computers in workplace and worktime will be more clearly understood by means of the employees' survey. It will be interesting to compare on that point, opinions of firm respondents and opinion of employees themselves.

## **2.5. Constraints and obstacles to computerization**

Computerization choices are submitted to some constraints (*see table 7*). The three main restrictions come from market and regulation pressures. In all, the first constraint ticked by accounting firms is the increasing pressure of other accountants' competition (38.7 %). Increasing pressure of other professionals' competition, though less restrictive, is ticked by 12 % of firms, and more among the big ones. In second comes administrative regulation requirements, which is quite natural in a occupation where legal aspects are central. Anyway, occupational regulation requirements, which are complementary to administrative ones, are ticked by 24.7 % of firms. Customers' requests come in third position (34.7 %), but it is by far the first constraint for the biggest firms. Services producers restrict less frequently (19.4 %) computerization choices than market and regulation pressures, and in this case medium sized firms are a little more concerned. Far from those constraints come changes in firm structure and groups or networks requirement (quoted by about 6 % each).

Table 7. Main constraints upon computerization choices

| Choices restricted by ...<br>( %)                           | Number of employees |      |       |       |       |       |
|---|---------------------|------|-------|-------|-------|-------|
|   | <5                  | 5-9  | 10-19 | 20-99 | >99   | Total |
| ... increasing pressure of other accountants' competition   | 37.0                | 37.0 | 43.7  | 48.0  | 41.5  | 38.7  |
| ... increasing pressure of other professionals' competition | 10.6*               | 13.0 | 12.5  | 17.0  | 17.0* | 12.0  |
| ... market uncertainty                                      | 22.0                | 22.0 | 21.4  | 22.6  | 13.2* | 21.9  |
| ... customers' requests                                     | 27.5                | 42.7 | 39.9  | 45.4  | 64.2  | 34.7  |
| ... services producers' requests                            | 15.9*               | 22.5 | 23.8  | 26.3  | 13.2* | 19.4  |
| ... administrative regulation requirements                  | 30.8                | 39.7 | 44.2  | 45.6  | 39.6  | 36.0  |
| ... occupational regulation requirements                    | 23.3                | 26.1 | 26.0  | 27.7  | 20.8* | 24.7  |

(Preliminary results on 1169 respondents)

\* figures derived from less than 20 responses, significance in doubt

Even if prices of computers have considerably lowered with time, financial costs are the main obstacle or brake to the development or working of computing ticked by surveyed firms. 59,5 % refer to it when ticking their difficulties, and that figure does not change significantly with firm size. 10 % consider even that costs are "very important" obstacles. Technical problems are nor far behind. 42.9 % find difficulties with hardware compatibility (54.8 % of the biggest), and for 37.2 % it is hard to follow technical changes (52.8 % of the biggest). A little less worrying are the difficulties to train, recruit or motivating the staff (32.6 %), or to find adequate equipment (31.0 %). Technical failures are the least worrying (13.7 %), and almost never considered as "very important". So, beyond the cost problem, the main obstacle seem to lie in a lack of adapted technical information.

## 2.6. Some special results on firm organization

The part of questionnaire concerning organization will not be fully processed here. Yet one point can be presented, as it brings methodological comments. It deals with network membership. In a 1996 survey, the frequency of firm network membership was evaluated at about 8 %. In the current survey, it could be evaluated at 31 %. Whereas the 1996 survey showed that firm networks were strongly expanding, and although it included firms without employees, where the membership rate is lower, the comparability of the two figures is doubtful. The reasons lead probably in questioning strategies.

When building the present questionnaire, it appeared that it could be difficult to ask a direct question about it. Furthermore, different network categories had to be separated in analysis. So it was chosen to list some typical categories of networks and to ask the firms to tick their type. Those categories resulted at the same time from preconceived data and from the processing of a previous survey centered on firm networks existence and functions. The four categories were :

- group of companies (with financial links)
- network of firms sharing means or standards to produce
- network of firms specialized in geographic areas or customers' activity
- international firms network

The previous survey was performed in 1996 on the accounting, consulting and juridical activities. The existence of networks was the first question in that survey, and screened the rest of the questionnaire. It was a unique question, without examples or types of networks, as questions concerning networks functions were in the continuation of the questionnaire. It specified a definition

of networks : "a set of firms entered into formal or informal durable business relationship who establish a community of interests, even restricted".

It appears plausible, but not certain according to the rapid expansion of the networks, that those two characteristics in the previous survey (screening question and theoretical definition in the question) lead to an under-estimation of network members.

### **3. First conclusions and future issues**

The essential conclusion at that time concerns the feasibility and usefulness on that type of survey that sheds light on some aspects of firm organization. It would be good to extend it to other services industries, as statistical information on computers supply is lacking.

Of course, our data analysis is still far from complete. Results presented here don't rest on all the responses, nor on the entire questionnaire. The first development will be to complete them on those two aspects, and to correct them for total non response. Using the entire questionnaire will lead to build a typology of firms regarding computerization as well as organization and to compare them, and of course to compare data for different industries. Next developments will use extra data deriving from structural survey to analyze firm results in the light of their organization. Finally, data will be merged with employees' survey to see the two faces of the firm's mirror... The first analysis allows to be hopeful on those projects.

This survey addresses some questions to services statisticians. Those concerning the use and significance of a joint firm and employee survey, could find an answer when completing data processing. It has formerly received partial answers, since a experiment had been attempted previously on manufacturing industries, that led to interesting results. The only question mark rests on the adaptation to this technique to a sector in which very small firms and self-employed people are numerous.

The second practical question deals with the choice of mixing organization and computerization themes. It seemed to us that there were some signs of interesting links on those subjects. On that matter too, future data processing will shed some light.

The third question deals with the choice between a general questionnaire addressed to a vast field of activities and a specialized one. If the links between organization and computerization appear strong enough, the usefulness of specialized questions will appear greatly. Another advantage of a specialized questionnaire is that it allows very precise and adapted questions. Here, for instance, listed categories of software or types of data transfers with different partners were very detailed and close to practical experience in the surveyed activity. The remark on the network membership shows, if it was necessary, that precise questions lead to a different, and therefore probably best, understanding than general ones. A more general question on software (do you use general software ? professional software ?) or on data transfers (do you send or receive data files from/to ...) could have led to supplementary omissions.

Other questions deal with the desirable frequency of that type of survey. The speed of technical changes speaks for short extensions of time between two surveys. But in this case, a specialized questionnaire would be too costly. A compromise would be to ask an annually limited number of qualitative questions and realize specialized surveys every 3 or 5 years. In those surveys could be introduced a limited number of quantitative questions.

## **Annex 1 : Data collection and responses rates in accounting services survey**

### **A.1. Sample design**

Table A1. Inverse of sample rate mean by firm size

| Firm size (number of employees) | 1-4  | 5-9  | 10-19 | 20-99 | 100 + | Total |
|---------------------------------|------|------|-------|-------|-------|-------|
| Number of firms in the sample   | 150  | 256  | 235   | 902   | 73    | 1616  |
| Inverse of sample rate mean     | 43.8 | 13.1 | 6.5   | 1     | 1     | 7.7   |

The survey covered firms, both companies and sole proprietorships, with at least 1 employee. Firms of 20 employees or more were drawn from the national firm register (SIRENE). Most of them are annually surveyed by the structural survey on services industries. The smallest firms were sub-sampled from the 1996 structural survey sample. The total sample was stratified according size.

### **A.2. Questionnaire structure**

The questionnaire has 24 questions with different alternatives. In all, the survey includes about 220 variables. It has been built by a supervisory committee including professionals of accounting and computer services and researchers.

The questionnaire begins with a unique and general question about the deciding factors for firm strategy (extending the delivery of services, improving in quality, cost supervision, team coordination, maintaining of regular customers or conquest of new ones, external growth).

The second part of the questionnaire concerns external as well as internal firm organization

- firm network membership
- part of turnover generated by customers who were sent by a network or colleagues
- constraints upon organization and computerization choices
- presence in or outside the firm of a specialist for different functions (quality, research, marketing, computers, manpower resources, accountancy, documentation...)
- types of organizing methods (standardization, working groups, teleworking, encouraging remuneration policies...)
- identification of tasks reserved to managers and/or staff members
- types of specialization of staff members
- types of pricing
- existence of a seasonality or uncertain flows of activity and means to adapt in terms of work organization
- obstacles coming up when changing work organization

Most of the questions were asked both for 1997 and 1994 reference years.

The third part of the questionnaire concerns firm computerization :

- available hardware and software in the firm
- part of time spent on a computing task in firm office, at customer's office and at home for managers, staff members, secretarial and administrative staff
- belonging to a users' club or association
- identification of choices or actions reserved to managers and/or staff members in computerization (hardware and software choice, system maintenance, users' assistance, users' training)
- number of training days for the past year
- data transfers and exchanges (different types of data, different types of partners)
- uses of the internet

- use of CD ROM documentation, existence of customers file destined to marketing actions, internal electronic mail...

As in the second part, most of the questions were asked both for 1997 and 1994 reference years. No information about economic results of the firm is asked, for the data processing will use the complementarity with other surveys and administrative data.

In all, the questionnaire is four pages long, with a very large majority of qualitative questions, which is quite bearable for respondents. The duration of completing the questionnaire, as tests showed, is about half an hour for a member of management staff.

### **A.3. A mix of postal and personal interviews**

The survey was mainly performed by a mail questionnaire. We sent out the questionnaires in February 1998. A reminder was sent to non respondents at the end of March. As it was a compulsory survey, we sent the first days of June a more formal letter, engaging firms to answer before July 3rd. At the same time, we asked to specialized interviewers to visit the thirty biggest non respondent firms and obtain answers, in order to have the best possible coverage for the total turnover of the sector. All these process significantly enhanced the response rate.

Final non respondents will receive in the last days of August a last letter recording officially their non response. This letter marks generally the start of the proceedings for fining non respondents in compulsory surveys. Actually, we do not intend to fine firms for non response in that survey, but this very official letter generally succeeds in obtaining new answers.

### **A.4. Total non response**

By the middle of July, we were reaching a response rate of more than 78 %, which is the best result ever known for a specialized and uneven survey on services industries. As we were expecting some extra answers, the global response rate will be really good.

More precisely, on 1616 questionnaires, 1269 answers were received before July 15th, 64 firms had ceased their activity, 20 other ones had moved without known address (and probably a very large part of them had ceased their activity too), 21 questionnaires were received with no information on it (generally survey refusals) and 242 questionnaires were still expected.

Table A2. Response rate by firm size

| Number of employees | 1-4  | 5-9  | 10-19 | 20-99 | > 99 | Total |
|---------------------|------|------|-------|-------|------|-------|
| Response rate       | 76 % | 73 % | 76%   | 77 %  | 75 % | 76%   |

The figures in the paper use the 1169 keyboarded questionnaires by June 30th, which represent a response rate of 76%. The response rate calculated on those data was quite comparable in different firm sizes (*see table A2*). That is why no correction for non response will be done in these preliminary results. Of course, figures are weighted by inverse of the sampling rate. In the future, data will be re-weighted to assure a proper representation of the population on key variables.

### **A.5. Partial non response**

As for total non response, partial non response (i.e. non response to separate questions) analysis leads generally to satisfactory results, with some essential features :

- every item are not always addressed, but complete absence of answer to all items of the same question is not frequent.

About a half of the 38 sub-questions (concerning the same year, for instance) presented a non response rate lower than 3,3 %, 3 were below 5 %, and only 4 questions were above 10%. In one of these 4 last cases, an error in the questionnaires is in question : some figures to tick were not printed. Two other cases concerned quantitative questions.

- qualitative questions lead to a better response rate than quantitative ones.

There were only two quantitative questions in the survey, which could be divided into four sub-questions.

The first question asked for an estimation of the part of work time spent on directly using computers at home, in firm premises and in customers' premises and for three categories of persons : managers, staff members, secretarial and administrative staff. If non response is not too important (between 7 and 8 %) for managers and staff members, the respondents were much more reluctant to estimate a figure for secretarial and administrative staff (17,7 %). More than a difficulty linked to the quantitative nature of the question, that relatively high non response rate shows probably that those questions were to be limited to the employees' survey.

The second one asked for the total quantity of computer training days in the firm. In that case, it probably reflects a difficulty in finding the information in firm's documents. That difficulty on the quantitative measure of training had been noticed previously in other surveys.

- small firms answer less completely to the questionnaire than biggest ones.

That situation is frequent in firm surveys. On the very subject of the present survey, it is probable that small firms feel less concerned than big ones on organizational matters. That situation had been noticed before the survey by occupational organizations. There is frequently no non response for firms above 99 employees, and non response rate increase as firm size decrease. But actually small firm (less than 10 employees) non response very rarely overtakes 7 %, which is less than anticipated before realizing the survey, and still allows good data analysis.

- parts of questions concerning 1994 or evolution since 1994 have a greater non response rate than those concerning the current situation.

This observation probably partly results from incapacity for the respondent to remind or learn past situation, and partly from question inadequacy in case of recent firm creation. As far as the analysis is concerned and like in the small firms case, the non response rate remains quite acceptable. To go back to the origins of non response in that case, it would be useful to search information about firm creation date and filter the response through this information.

- questions dealing with computing equipment and data transfers have the benefit of particularly low non response rates (less than 2 or 3 %), which is encouraging for future surveys.