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> NEW INFORMATION TECHNOLOGIES, EMPLOYMENT AND WORK : the case of secretaries LUCIE DESCHENES

Le Centre canadien de recherche sur l'informatisation du travail

Canadian Workplace Automation Research Centre



Communication Canada Canadian Workplace Automation Research Centre (CWARC) Organizational Research Directorate

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# NEW INFORMATION TECHNOLOGIES, EMPLOYMENT AND WORK : the case of secretaries LUCIE DESCHENES

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\*The views expressed in this report are those of the author. \*Une version française du document est aussi disponible.

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#### INTRODUCTION

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The large-scale introduction of New Information Technologies<sup>\*</sup> (NIT) and, more specifically, office automation into the working environment has aroused, many and varied reactions over the past few years. The ititial fear that unemployment would increase was accompanied by the hope that working conditions would improve as a result of eliminating repetitive and monotonous tasks.

In general, whether it is the quantitative impact on employment or the more qualitative effects of computerization on the nature of work, these questions are still causing controversy and debate (MESS, 1986). Two diametrically opposed attitudes are often a positive attitude, blindly trusting in new observed : technologies; and a negative attitude, associated with complete rejection of these technologies and resistance to change. It should nevertheless be noted that attitudes between these two poles are more frequently encountered as office equipment becomes a more general phenomenon. Use of a machine plays a large part in demystifying it, and it has been observed, for example, that the positive attitude of secretaries to word-processors (WP) becomes more pronounced as use and experience increase (DAVID Mc NEIL, 1986).

It bears recalling that companies invest in New Information

By "new information technologies", we mean technologies derived from micro-electronics and telecommunications It bears recalling that companies invest in New Information Technologies (NIT) first and foremost to improve service sector productivity, which has remained well below that of sectors of activity. other However, view of а narrow productivity, seen mainly in terms of substituting the machine for the individual, may have serious consequences. In the short term, automation of office work brings an increase in unemployment and a shift in employment without necessarily offsetting this by net job creation.

At the individual level, some people see their jobs changing and even disappearing. We must emphasize that the impacts of this have varied widely depending on the economic sector but also from one company to another, since the management climate of a company has its own specific effect on the number and quality of jobs affected by introducing office automation.

We shall see that the effects of New Information Technologies (NIT) are quite diverse and modify as much the organization and work environment of a company as of its occupational structure and job content.

#### 1. IMPACT ON EMPLOYMENT

The effects of New Information Technologies (NIT) on employment are unquestionably the greatest social impact of work automation; this fear is revealed in public opinion surveys but also by the sustained interest shown by governments and unions, not to mention researchers, int this question. The debate surrounding the impact of New Information Technologies on employment uses basically the same arguments as the early 20<sup>th</sup> century debate on automation per se.

## 1.1 The pessimists

On one side, there are the pessimists : they maintain that the necessary counterpart to economic growth associated with technological advances is a reduction in jobs, thus, in the long run more unemployment.

Unfortunately, a number of studies confirm this hypothesis : there are indeed adjustment costs related to the introduction of New Information Technologies (NIT) that result in lost jobs not only in the short term, but also in the long term.

It is feared, for instance, that the service sector will be unable to absorb all the workers affected by technological change associated with office automation. Under this approach, only those highly qualified individuals who hold new positions linked to these technologies can hope keep their jobs.

New job creation could not then offset the elimination of jobs as result of technological change. It is accordingly felt that the service sector will be affected the most, since this sector has the highest concentration of information-related jobs that might be replaced by New Information Technologies (NIT).

A study by the U. S. National Bureau of Standards 1968 to 1978, productivity reported that, from increased by 150 percent in agriculture and 83 percent in industry, while in offices it rose only by 4 percent (WYBOUW, KANAAN and BLAKE, 1987). It was precisely to counter the low productivity and rising labor costs in offices that New Information Technologies (NIT) were so widely implemented. Several authors then predicted that the office job category would be the most severely affected. As a consequence, the female labor force should suffer particulary, since it is mainly concentrated in this sector.

In 1979, a Canadian study (ZEMAN, 1979) forecasted that nearly 40 percent of office jobs would be eliminated by 1990, and Heather Menzies (1981) had even suggested that as many as 1 million Canadian women would be unemployed by 1990 if no adequate recycling program was developed.

Research carried out abroad in the early 1980s yielded the following results (BIT, 1982) : 82 000 secretarial and typist jobs in all sectors would conceivably be eliminated due to introduction of word processor (WP) in France; 250 000 office jobs would most probably disappear in England; employment in offices would drop by 20 to 25 percent in Western Europe due to the 5 million typists who would lose their jobs once office work became automated.

A more recent study conducted in 1984 by the U. S. Office of Technology Assessment (OTA, 1985) forecast that the demand for office workers would decrease by 11.3 percent. With time, it appears however that the quantitative impact on secretarial jobs is less pronounced, since current expectations are less for an increase in unemployment than for a decrease in the demand for labor.

#### 1.2 The optimists

On the opposite side are the optimists : they believe, based on the experience of previous industrial revolutions, that there will effectively be unemployment in the short term, but that jobs will be created in the long term due to improved productivity and competitiveness.

There would accordingly be a significant shift in employment, resulting in a change in the occupational structure. It is commonly felt that jobs will be created, eliminated and shifted in certain sectors, as predicted by the Nora-Minc report (1978) in France, which saw a threat to some job categories but considered this a necessary evil given the context of international competition.

A consensus thus takes shape that while it causes many jobs to disappear, technology also changes the nature of many others and creates new ones. For example, it is predicted that, by the end of the decade, over 50 percent of the labor force will be made up of office workers, that is, workers involved in information transactions (DIEBOLD, 1984). Moreover, whereas the New Information Technologies (NIT) absorb the know-how of individuals and succeed in producing a mass of goods and services in their stead, it appears that they do not automatically cause these individuals to lose their jobs.

study based on a survey of employers in 112 A businesses in the Montreal area (BENOIT, COSSETTE and CARDILLO, 1984) attempted to analyze the impact of Word Processor (WP) on the level of employment of secretaries in companies in the manufacturing and service sectors. The results indicate that the impact on employment may not be as disastrous as some authors had previously suggested. The study explains that Word Processor (WP) makes it possible to satisfy additional requirements or offer more services to a larger clientele, and there is a consequent growth in services without an attendant secretarial employment. drop in total It must nevertheless be noted that jobs in this sector are now increasing at a slower rate.

The preliminary results of another research project (DAVID MC NEIL, 1986) carried out among the immediate superiors of the women using information technology in a public company in the transport field show that the number of secretarial jobs has not decreased and is not

expected to decrease over the next five years at least. The jobs that are threatened are in the area of data collection, and these should drop by 50 percent over the next four years. Once the organization is fully computerized, these jobs will have almost entirely disappeared.

## 1.3 Net effect on employment

There is as yet no clear indication as to what the net result of this job creation/elimination process will be. In 1979, a study by the Communications Canada (ZEMAN), based on the analysis of studies from the major OECD countries, concluded that there was no net change in employment as a result of applications of new technologies.

A recent Quebec study observed that, at the present time, there is no calculation of the total effect nor any overall forecast of the number of jobs threatened by the use of new technologies for the Quebec labor force as a whole (MESS, 1986).

In the same vein, a study by the OECD in 1986 concluded that, to date, new technologies had had little net

impact on total employment in OECD countries in general. The most significant effect of new technologies would now seem to be less the volume of jobs than the new distribution of jobs over regions, sectors, industries and professions which, in turn, will lead to problems of adjustment. The current trend appears to recognize that technology will have only limited effects on the overall level of employment in comparison with effects linked to fluctuations in macroeconomic growth.

A recent Economic Council of Canada study (PICOT and LAVALLEE, 1986) reached similar conclusions : using the Statistics Canada input/output model, the authors attempted to examine the relations between variations in employment between 1971 and 1981. They determined that employment had risen by only 32 percent, an increase that is no doubt due more to the overall domestic demand for goods and services (54 pourcent), than to technological change (7 percent).

If these conclusions prove correct, we might formulate the following hypothesis : given that secretaries are necessary in all sectors of activity, their employment should increase, particularly in high-growth industries such as business services.

For the moment, however, it appears just as risky to draw conclusions as to effects on a given sector based on a case study, as to trace a direct link between a future increase in unemployment and the simple fact that technology makes it possible to increase per capita production. The main question remaining for the time being is : will the increase in productivity result in less jobs or will industrial growth offset this with new job creation?

It thus becomes important to determine whether the reduction in employment is offset by the simultaneous creation of new jobs. For instance, in a climate where office automation is being widely introduced, has the situation of women in the labor market improved ? Will they have access to more jobs and to better-qualified jobs ?

In this context, recycling human capital takes on its full importance, since it is essential that individuals, if they cannot keep "their" jobs, at least be able to keep "a" job, and eventually have access to a more interesting job.

Although there is no consensus for the moment as to the net result of job loss and creation, it is nevertheless agreed that, by improving productivity, New Information Technologies (NIT) eliminate and

transform jobs and create many new ones. For example, we are currently seeing new jobs being created to correspond to new services. These new jobs are often due to reassignment of personnel within the company as a result of job suppression and creation, which in turn leads to a transformation of work content.

The main effects of new technology are apparently to be sought more in the area of changes in occupational structure and the qualifications required of the present labor force than in increases and decreases in levels of employment and unemployment as a whole (OECD, 1986). This concern is reflected in the changing orientation of researchers, who now appear to be more concerned with the effects of new technologies on the nature of work.

#### 2. IMPACT ON WORK

In addition to revolutionizing the job market, the introduction of New Information Technologies has qualitative effects on work. It causes significant changes in the structures of work organization, as well as the content of work and the conditions under which it is performed.

Here again, there are varying points of view : on the one hand, it is feared that the qualifications actually required to perform a given type of work will be downgraded, while on the other it is

anticipated that the labor force in general will become more highly qualified.

## 2.1 Deskilling of jobs

One approach postulated the deskilling of work based on the analysis of job content. In the case of office work, it may be seen that many non-conceptual tasks have been taken over by computers. For example, an attempt to improve productivity, certain routine or monotonous duties are automated, making it possible to produce a greater volume of text with the same personnel. These gains in productivity also vary with the type of machine used and the skill with which operators master it (DESCHENES, 1987).

Standardizing tasks means borrowing the production methods currently used in industry, an approach which has led to the widespread use of word-processing pools. This type of reasoning originates in the Taylorist view of work organization whereby the machine improves production while increasing the discipline and dependence of the individual (BENOIT, COSSETTE and CARDILLO, 1984). With the introduction of Word Processor (WP), there has been a tendency to separate secretarial duties (incoming mail, file-keeping, etc.) from correspondence-related tasks, which are then centralized in a pool (1).

Paradoxically, while repetitive, monotonous tasks, were being eliminated, new jobs were being created that involved a lot of routine work. It has been observed, moreover, that machine monitoring of work and the pressure to speed up production depersonalize the working environment, leading to a deterioration in working conditions (MESS, 1986).

Several authors have linked the assignment of secretaries to pools with the first phase of the introduction Word Processor (WP) in offices. This tendency to centralize some or all secretarial activities in a work pool is particularly common in large companies and in the public service, despite the fact that it is possible to take advantage of Word Proccessor (WP) by reorganizing office work in individual work stations.

It would appear that recent developments in office automation could make for a considerable improvement in the working conditions of secretaries. We are

looking here at a completely new breakdown of work, whereby office automation technologies make it possible to integrate all the operations involved in producing a document (preparation, typing, reproduction, etc.), thus freeing up time for more diversified duties.

If we analyse this change, we see that it appears to correspond to two very distinct phases in technological development : the trend to centralization of information processing, as shown by computer processing centres and work-processing pools, versus the decentralization of activities due to the widespread introduction of microcomputers. The first phase primarily involves the automation of low-skilled tasks, while the second also affects more highly skilled work. We have thus gone from a work approach guided by the rules of Taylorism to a more user-friendly approach. Office automation applications such as personal computers, work stations, networks, work-processing and others should increasingly be guided by the second approach.

## 2.2 Increasing job enhancement

The second approach supports increased job enhancement. For example, authors looking at work content have

observed that there has been some job enrichment, as in the case of a secretary who takes on more administrative support duties due to the sharing of some managerial work, in particular in the area of computerized management or the implementation of new forms of information precessing (DESCHENES, 1987).

An opinion poll on the impact of Word Processor (WP) (ROY,1983) revealed that the majority of secretaries see the development of these skills as an upgrading of their qualifications. Paralleling this, it would appear that changes in the content of their work are linked to tasks that require greater concentration. These results are comparable to those of another study (JACOB, 1985) of word-processing operators who felt that their work had become more rich and varied but now required more skill. As might have been expected, the organization of work around individual work stations is linked to a perception that work has been enhanced.

Other authors have noted that secretaries now have broader skills, due to their increased responsibilities. This general trend towards more diversified skills varies depending on the sector of activity, size of business and position level. One thing is certain : the advent Word Precessor (WP) and the micro-computer has changed the content of duties and thus created a requirement for new professional qualifications and new know-how since, on the whole, the qualifications required for these new duties are higher than those needed to use a typewriter. A number of experts have pointed out the importance of basic knowledge as opposed to technical skills which rapidly become outdated. According to them employers can more easily recycle workers with a good basic education.

## 2.3 <u>Qualifications : two extremes</u>

Since it is normally routine tasks that are automated first, it is accordingly the less qualified workers whose jobs disappear or change. Many office automation technologies are taking over repetitive work; for example, Word Processor (WP) covers such operations as correction or deletion. This results in a decrease in the number of secretarial jobs, while new jobs appear that are linked to more qualified positions.

It is common, when new technologies are introduced, for office workers (operators, clerks, secretaries) to be displaced and often replaced by more highly specialized professionals and technicians (COSSETTE, 1982). A number of studies have indicated in this connection that qualifications now tend to polarize about two extremes. There is an increasingly wide gap separating skilled jobs from unskilled jobs, thus diminishing the potential for professional mobility. As well, it is forecast that the requirement for semi-skilled or unskilled labor will gradually decline and that the jobs that are created may not be taken up directly by those whose positions have been eliminated, thus creating adjustment problems between labor supply and demand. There is a risk here of a shortage of skilled and highly qualified labor existing alongside a high rate of unemployment. The challenge will then be to integrate displaced office workers into the new professional and technical job categories.

New technologies could thus offset the breakdown of tasks by a broader diversity in jobs while reinforcing the division between conceptual and operational work (MESS, 1986). These two phenomena would, moreover, have the same result, of reducing the professional mobility potential of poorly skilled workers (COSSETTE, 1982).

### CONCLUSION

Whereas the office sector had until recently been little affected by micro-electronic revolution, office automation has broken with this trend by bringing about major changes. Altough it is often claimed that office automation is mainly aimed at improving the productivity of managers and professionals, we observe that it is the routine duties, performed for the most part by women, that are the first to be automated.

Normally, the process begins with the introduction of office automation tools (work-processors or micro-computers equipped with various types of software) among typists, secretaries and If women may be said to be at the leading edge of clerks. technological innovation, it should nonetheless be emphasized that there tends to be a sexualization of equipment. During the first phase of work computerization, we did in fact notice the reproduction of the segregation of jobs, that is, word processors generally used by women and micro-cumputers by men. The fact remains that keyboard skills have never been held in any great esteem, which has contributed to the lack of prestige surrounding Word Precessor (WP) and, to a certain extent, to a reinforcement of the hierarchy of skills perceived between male and female work.

We feel however, to break down the barriers that are currently forming, that it is essential to promote the use of office

automation tools by women, which is more valorized than Word Processor (WP). This means having greater numbers of women working on micro-cumputers, which have a higher social value than word-processors, thus ensuring them greater professional mobility. In fact, New Information Technologies competency is increasingly necessary for secretarial duties and is now one of the requirements sought when recruiting secretaries. Although this competency is observed to be developing, it nevertheless rarely leads to higher pay or promotion to a higher job category, in spite of the new responsibilities involved.

We believe that New Information Technologies competency will also be indispensable to keeping one's job in the future. To achieve this, it is essential that training be given to women beyond the simple operation of a word processor to enable them to acquire new office automation skills, so as to favor the true integration of women into the computer culture.

Implementation methods play a major role here. We feel, moreover, that one way of breaking down resistance to change would be to give all employees, and particularly women, a voice in the process of decision-making on the introduction of office automation, thus giving women more power within the organization. It is observed that workers in general have little say in decisions that concern them. For example, a recent study (MORISSETTE and DESJARDINS, 1986) showed that the majority of

workers were not consulted on the choice of hardware or software when word-processing was introduced, while 31 percent of them were consulted regarding the physical layout of working space.

In such a context, management activities and human resources planning play the dominant role in the implementation of office automation. To date, little research has dealt with this issue, and very little is as yet known about current management practices in this connection in Quebec (MESS, 1986).

We may nevertheless conclude by reiterating that management of technological change and implementation methods are significant factors in determining the nature and extent of impacts on individuals, organizations and the content of work.

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