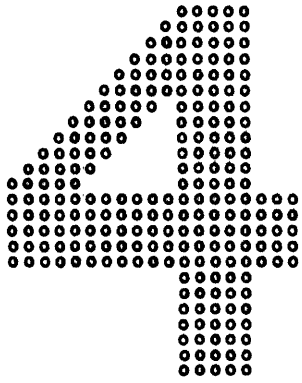

CHANGEMENT SOCIAL ET TECHNOLOGIE EN EUROPE.

BULLETIN D'INFORMATION N° 4

Evenements récents en République Fédérale d'Allemagne, France, Italie, Pays-Bas, Belgique et au Royaume-Uni

SOCIAL CHANGE AND TECHNOLOGY IN EUROPE.

INFORMATION BULLETIN Nr 4

Current events in Federal Republic of Germany, France, Italy, the Netherlands, Belgium and the United Kingdom

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Cette étude a été réalisée par la Commission des Communautés Européennes dans le cadre de ses "Programmes de Recherches". Les analyses et les propositions présentées n'engagent pas la Commission. Pour tout renseignement concernant cette étude, prière de s'adresser à : M. Bernard Hélin, DG V/A/2 - Bâtiment Archimède 1 - 7ème étage, bureau 7/19 - Tél. 235.78.95.

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This study was realised by the Commission of the European Community as part of its "Programmes of Research". The analysis and the results presented do not commit the Commission. Informations concerning this study can be obtained at : DG V/A/2 - Mr. Bernard Hélin, Building Archimède 1 - Room 7/19 - Tel. 235.78.95.

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V/29/82 - FR

PRESENTATION

Cette quatrième livraison de "Changement social et technologie en Europe" se situe dans le prolongement du premier numéro. Il en constitue à la fois une actualisation et un approfondissement.

Ainsi, après un second numéro consacré à une synthèse des études portant sur la relation technologie d'information-chômage et une bibliographie thématique (numéro 3), le présent bulletin regroupe de nouvelles contributions des correspondants nationaux du Pool Européen d'Etudes. Six pays sont maintenant présentés, d'une façon sensiblement plus homogène et donc plus directement comparables que dans le premier Bulletin. Des situations nationales spécifiques, l'inégale disponibilité des informations ainsi que le comblement de certains des écarts qui existaient dans le premier numéro conduisent toutefois au maintien d'une hétérogénéité encore importante des contributions.

- Le rapport relatif à la République Fédérale d'Allemagne (Willi PÖHLER) couvre la période allant de juin à décembre 1981. Il actualise, de façon systématique et selon le même schéma, le texte de septembre 1981.

- Le texte français (Olivier PASTRE) doit sa spécificité à la récente réorientation de la politique nationale. Il présente les axes de développement de la nouvelle politique gouvernementale dans le domaine qui nous concerne, couvrant ainsi la période postérieure au 10 mai 1981 (date de l'élection du nouveau Président de la République).

- Le rapport italien (Paolo-Mario PIACENTINI) constitue surtout un approfondissement du texte d'août 1981.
De ce point de vue, il prend place au côté des rapports relatifs aux trois autres "grands" pays qui se trouvaient dans le premier Bulletin.

- La contribution relative aux Pays-Bas (Ray JURKOVICH) présente le récent rapport RATHENAU et rend compte d'une série d'interviews menées auprès de certains partenaires sociaux.

- Quelques aspects de la situation belge sont présentés dans la première contribution de R. BLANPAIN. La "couverture" de ce pays sera peu à peu menée à bien.

- Enfin, le texte relatif au Royaume-Uni (Kurt HOFFMAN et Ian MILES) actualise point par point le rapport précédent. Il couvre la période octobre-décembre 1981. Il présente également, de façon très concrète, la situation dans quelques secteurs des services ainsi que dans l'industrie manufacturière.

Bernard RUFFIEUX
Consultant pour l'E.P.O.S.

INTRODUCTION

The fourth issue of "Social Change and Technology in Europe" is in fact a continuation of the first one. At the same time it updates and developes it.

So having devoted the second issue to a synthesis of the studies dealing with the relationship between information technology and unemployment, and the third one with a thematic bibliography, this bulletin brings together new contributions from the national correspondants of the E.P.O.S. Six countries are now represented in a appreciably more homogeneous fashion and thus lend themselves more readily to comparison than in the first issue. However, specific national situations, the unequal availability of information, as well as the filling in of some of the gaps which existed in the first issue tend to preserve the still important heterogeneousness of the first contributions.

The report concerning the Federal Republic of Germany (Willi Pöhler) covers the period from June to December 1981. It systematically updates with the same scheme the previous text of September 1981.

The French contribution (Olivier Pastre) owes its specificity to the recent reorientation of national policies. It presents the lines of development of the new government policies concerning our field, thus covering the period from the 10th May onwards (date of the election of the new President of the Republic).

The Italian report (Paolo-Maria Piacentini) is essentially a development of the August' 81 text. As a result of this it now takes its place with the other three "major" national reports to be found in the first bulletin.

The contribution about the Netherlands (Ray Jurkovich) exmaines the recent Rathenau report and gives an account of a series of interviews with some of the social partners.

Certain aspects of the Belgian situation are presented in the first contribution of R. Blanpain. The survey of this country will be completed bit by bit.

Finally, the text about the United Kingdom (Kurt Hoffman and Ian Miles) updates point by point the previous report. It covers the period from October to December 1981. It also presents, in a very concrete way, the situation in certain sectors of the service industries and manufacturing industries.

Bernard RUFFIEUX
Consultant for the E.P.O.S.

QU'EST-CE QUE L'E.P.O.S. ?

Sur proposition de la Commission, le Comité permanent de l'Emploi a donné un avis favorable à la création d'un Pool Européen d'Etudes et d'Analyses (E.P.O.S.) dans le domaine de la nouvelle technologie d'information et de l'emploi.

Ce Pool a trois fonctions principales :

- rassembler et évaluer les recherches effectuées et les expériences significatives au niveau national ;
- diffuser et comparer ces activités de recherche et ces expériences, en mettant des synthèses à la disposition de ceux qui participent aux débats politiques et scientifiques, tout particulièrement les partenaires sociaux ;
- orienter, pour le futur, les études et analyses factuelles et prospectives.

Actuellement, le travail du Pool consiste essentiellement en la réalisation d'une base documentaire, de bibliographies commentées et du présent bulletin.

WHAT IS THE E.P.O.S. ?

The Permanent Employment Committee was in favour of the Commission's proposal to set up an European Pool of Studies and Analyses (E.P.O.S.) in the field of new information technology and employment.

The Pool has three main functions :

- to collect and evaluate completed research and significant developments at national level,
- to compare and circulate the results of such research and developments, by making summaries available to those who take part in political and scientific debates, in particular employers and trade unions,
- to play a more directional role, in future, vis a vis factual studies and analyses.

At the moment, the Pool is essentially working on the preparation of a data bank, on annotated bibliographies, surveys and on the current bulletin.

SOMMAIRE

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Ray JURKOVICH

THE NETHERLANDS

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NL - ROTTERDAM.

Janvier 1982

Summary:

This report contains summaries of one major report on the social and economic implications of microelectronics in the Netherlands and rough sketches of the positions of various parties. In the latter case interviews were conducted with a small number of government employees, representatives of the major employer's association, three officials of the Federation of Dutch Unions (FNV). During the process of collecting reports and conducting interviews it became clear that the level of activity has been increasing. After the appearance of a major report in late 1979 the translation into concrete measures has only started recently. During the "lag period", however, there has been a great deal of discussion and debate about the implications of microelectronics for society. During this period it appears that efforts were made to establish committees which were charged with the task of seriously coming to grips with the problems and opportunities connected with the application of microelectronics. The network of informants is considerably larger than what was originally anticipated and it was thus not possible to obtain information from every organization and individual involved with microelectronics. Furthermore, there is a small moutain of reports which have been prepared by both governmental and private institutions and due to limitations of time we have not been able to examine all of them. Discussions of some government reports are either completely absent (e.g. the report on Information Policy) or referred to without a detailed discussion (e.g., the government's position on the content of the Rathenau Report). Effort was devoted to obtaining a rough sketch of as many developments as possible and not an in-depth description of each one. In forthcoming reports in-depth descriptions of selected relevant recent developments will be provided.

Government Activities

The report which has received a considerable amount of attention in the past few years bears the title *The Social Consequences of Microelectronics* which is most often referred to in the Netherlands as the Rathenau report. This report was prepared under the auspices of the then existing Ministry of Science Policy and was prepared by an ad hoc advisory committee chaired by Prof.dr. G.W. Rathenau (emeritus) who in addition to his academic experience served for several years as director of the Philips Applied Science Laboratory in Eindhoven. The report, 126 pages long, consists of seven chapters and four appendices. Chapter 1 provides the framework for the rest of the report. One major aspect of this chapter is the committee's judgement that since technology is something that can be steered and since its implementation carries negative as well as positive consequences for society the national government should have an active regulation role. Furthermore, given the uncertainties, possibilities and risks in the mutual relationship between technology and society government policy should be flexible.

Chapter 2 - Microelectronics - is an exceptionally clear discussion of the historical development of microelectronics, its construction, and what the current applications are (including robots).

Chapter 3 - Possible Consequences for the Dutch Economy - is a discussion of the possible implications for the Dutch economy at the macro, mezo and micro levels. Among other things efforts were made to estimate the effects of the implementation of microelectronics on unemployment under two conditions - the effects of the implementation of microelectronics together with and without government measures (i.e. a restricitive wage policy and extra investment). In one scenario in which the Netherlands does

not actively go along with the application of microelectronics, unemployment was predicted to rise to nearly one million in the year 2000. While the committee stated that the results of the scenarios should be regarded with caution due to methodological problems and the presence or absence of certain kinds of data, they stated in the conclusions to this chapter that they "are of the opinion that large scale introduction of microelectronics in the coming decade should be regarded as one of the most important changes in external factors which will influence the Dutch economy". Finally, the advisory committee made seven recommendations which are incorporated in chapter 7, the contents of which are provided further up in this report.

Chapter 4 - the Social and Cultural Influences of Microelectronics - is concerned primarily with the relationship between work and technology, the threat of microelectronics to privacy and freedom, employment security, the quality of work and whether technology can be guided in the desired directions. A "learning strategy" was suggested as a possibility in policy formation. That is, policy-making should be open and oriented towards the future; goals should be explicitly kept in mind and systematic evaluation should be conducted as a means to continuously adjust policy. Furthermore, organizations, institutions and individuals should be kept fully informed of the problematics of technology in general and microelectronics in particular in order to stimulate a wider basis of social involvement in policy-making (p. 77-78). While there are a number of recommendations in this chapter a major recommendation is the establishment of a center for technology assessment along the same lines as the Office of Technology Assessment in the United States and the VDI Technology center in West Germany.

Chapter 5 - Education - is the shortest chapter, 2½ pages. Concrete re-

commendations are not made in this chapter. Nevertheless, the advisory committee does state that the curriculums at all levels of the education system should include courses dealing with the various aspects of information science as a means to prepare younger generations for a future in which the new technology occupies a central role in almost all aspects of everyday life. While the advisory group does not explicitly recommend more application of microelectronics in educational technology they expect an increase in its use. They warn, however, that the situation should not be carried to extremes - e.g. where educational processes take place in the home. These kinds of situations fail to recognize the critical social character of education where people "... learn with each other and from each other" (p.83).

In chapter 6 - Policy - the major themes in the previous chapters are pulled together and general policy recommendations are made with the purpose of stimulating national action in the areas of technology assessment, a microelectronics center, a national information policy, education and work and employment. The general policy recommendations are then formed into concrete recommendations in chapter 7.

There are 5 topics in chapter 7 on which specific recommendations are made. These have not been translated in their entirety in all cases but the major points in most cases are listed.

First, on the subject of steering (or guidance) and control the committee recommends:

1. that their activity be continued;
2. that a discussion take place with Science Council for Government Policy in order to establish a technology assessment center in the near future;
3. that the results from technology assessment be formulated in such a

way that members of society can be informed of their results whenever they are desired;

4. in addition to periodical repetitive technology assessment, research should begin on the most important consequences of microelectronics and their underlying relationships.

Second, on the extension and intensification of technical expertise in microelectronics in the Netherlands, the advisory group recommended that:

1. a decision, in priniciple, be taken to establish a microelectronics center within one year;
2. in the near future experts be invited to collectively design concrete plans for the establishment of the center;
3. in the very near future cooperation between experts in this area be established with the objective to assist small and medium size firms. This cooperation and assistence is regarded as a forerunner towards the establishment of a center;
4. awareness programs be developed for the business community;
5. technological expertise in the area of microelectronics be periodically evaluated. This should be tested by comparing the Dutch situation in other industrialized nations;
6. the lag in the Netherlands concerning the production and use of microelectronics in products be shortened by government support for advanced design of microelectronics components and systems. This can be tied in with the policy recommendations found in another major report on innovation;
7. the national government should have a clearer and nationally directed policy where it concerns the development of new products and projects when there is a relationship with microelectronics. In particular, the national government should promote the use of microelectronics in

purchasing and project policies whenever the objectives are energy and material savings, environmental protection, preservation of employmentlevels, and the humanization of work;

8. a specialization in software is apparent for the Netherlands given its high added value and labor intensive character. The government should take supportive measures on this issue: in the short run financial support should be provided and long run measures should be adopted to promote education, especially in the information sciences;
9. at the international level, the Netherlands should advocate the standardization of interfaces and software standardization, especially software application.

On the topic of work and employment the advisory group made five recommendations. These are:

1. In order to maintain and, if possible, increase the current level of employment it is urged that the government follow an explicit innovation policy;
2. Retraining programs and refresher (or upgrading) courses as instruments to bring about changes in the labor market mean that the national government should devote more permanent attention in the past to the consequences of implementing microelectronics;
3. Planning of employment, investment, and education, and there underlying relationships, should be promoted. Planning, in which further guidelines could be provided by the Social Economic Council, should occupy a central in the government's social policy;
4. Studies should be conducted on: a. optimal and equitable distribution of work in society, b. alternatives to paid work, c. how changes caused by microelectronics in labor stratification and the employment market should be met. Issues related to the employment market can be ad-

ressed by the steering committee for the National Program for Employment Market Research. On the issue of incomes the Social Economic Council should be asked to provide advice;

5. Research on how microelectronics can be used to promote the humanization of work regarding health, safety, ergonomic and psychological aspects needs to be stimulated. For the choice of specific proposals consultation with potential users (e.g. employees) is desireable. The Netherlands Foundation for the Advancement of Pure Research and the national Applied Science Research Organiszation should provide special support for this and related research.

Eight recommendations were made concerning education.

1. Over the short run a broad consultation should take place between educational experts and those interested in social issues with the objective to make proposals regarding permanent education (éducation permanente);
2. Activity in the area of retraining and refresher courses that are especially directed at dealing with changes in labor stratification need to be developed;
3. Stimulation of microelectronics related disciplines is necessary for the purpose of catching up with developments abroad and if this is not feasible then to decrease the gap over the short run;
4. The creation of experts, including teachers, can be accomplished through postacademic education and the establishment of special courses. In the lower and higher vocational schools this can be accomplished by retraining and refresher courses. It is urgent that a arrangement be found for the different forms of training in the system and computer sciences;
5. For other types of education, research should be conducted regarding

the consequences for the curriculum when more emphasis is placed on gaining access to knowledge than memorizing it. What are the consequences for primary school curricula if they are to prepare people for a society in which technology occupies an important place?;

6. Furthermore, research should be conducted on the question to the degree pupils should be familiarized with modern apparature. It is very important in this research that the primary school system be included;
7. With regard to training programs, some of which have been commercially established and some of which are located within firms and elsewhere, those which are judged to be competent should be subsidized. They should be periodically controlled in order to insure the maintenance of quality;
8. Efforts should be taken to coordinate the different types of education. This should be done by establishing a *G*eneral *C*ommittee for *D*evelopment in the information sciences.

Finally, four general recommendations were made;

1. Keeping the public informed about new developments deserves special attention in order to strengthen support for policy;
2. The advisory committee urged that the Ministry of Science Policy quickly effectuate their plans to establish a committee concerning information policy. Special attention should be given to the PTT which has a major responsibility for the transport and handling of information. Guidelines, norms, and controls need to be established for PTT activities and private data banks. At the international level the Netherlands should advocate guidelines concerning information which spans borders (e.g. by way of satellite) which is a threat to the maintenance of national law. Above all, there is the danger of so-called cultural pollution.

This summary of the Rathenau report does not contain a detailed outline of the contents of the chapters. Those who are interested in more information should consult the English language version which can be obtained at the following address and ask for the report bearing the title "The social impact of microelectronics": Staats Uitgeverij
Postbus 20014
2500 EA THE HAGUE

(The IBM-number is: 90 12 03174 5; the report costs seventeen guilders.)

The government's official reaction to the Rathenau report is a 47 page document in which a response to each of the recommendations was provided and, in some cases, the motivation for their position was given. In general, the government was quite positive concerning the advisory group's recommendations. On the issue of technology assessment, however, the government did not regard an institutionalized approach as desireable. Nevertheless, a commitment to stimulate technology assessment was made. On the majority of the remaining issues the government promised to set aside funds to promote certain activities and to establish committees within and between ministeries for the purpose of studying the issues more thoroughly. In the first case, for example, funds have been set aside for a so-called credit arrangement which provide financial support for promising initiatives taken by firms desiring to produce highly advanced microelectronic components and systems.

Since the appearance of the Rathenau report and the government's position paper there appears to have been slow progress in working out the ideas found in both reports. During this period, however, a number of committees have been established some of which started operating around the middle of 1981. The content of one major recommendation has also shifted. Instead of one microelectronics center three have now been sugges-

ted. The committee charged with preparing a report on the tasks of the three centers has just completed their work. During the course of the committee's activities Stanford Research Institute was also asked to provide advice. While the three centers are to be located nearby the nation's Technical universities, the centers are to operate independently. One center, however, at Delft is to be located within the nation's Institute for Applied Natural Science and will cooperate with the nearby technical university. This center has made a small start in January by recruiting the first two personnel. In a future report for the Commission special emphasis will be devoted to the report dealing with these three centers.

As far as technology assessment is concerned, research where the social implications of the new technology is the major topic is increasing. The Ministry of Social Affairs and Employment, for example, is sponsoring research conducted at the University of Leiden on the social implications of microelectronics on women. This ministry has also contracted Metra Ltd. to conduct reviews of the qualitative and quantitative implications of microelectronics. The first report, referred to as Metra 1. was completed in 1980 and Metra is now completing their second report. The same ministry is also sponsoring research together with the association of Dutch Christian Unions on the effects of microelectronics and banks. This research is being conducted at Graduate School of Management at Delft, the principle investigators are Prof.dr. H. van Dongen and Prof. dr. G. Poeth.

The Ministry of Social Affairs and Employment has also set aside funds which can be used to improve the health and well-being of work: the subsidie applies, among other things, to situations where microelectronics imply changes in organizational structures and tasks where job content

is threatened. Firms can apply for these funds to hire consultants to provide advice for improvements.

Finally, the Minister of Social Affairs, in a letter to the Employment Market Council, stated that there are a number of issues in the Rathenau report, the first Metra report, and a report prepared by T. Huppes from the University of Groningen which need further clarification for policy-making. The Minister requested the Council to address nine issues, the answers to which will be used during tripartite discussions meant to take a step forwards in the direction of formulating policy concerning the social implications of microelectronics. These nine issues are:

1. the extent to which findings in the Metra 1 report concerning microelectronics in production processes abroad are and will be applicable for the Netherlands;
2. the amount and tempo in which microelectronics will be implemented in Dutch firms and what the effects on employment will be;
3. the occupational categories and sectors in which the number of jobs will increase or decrease as a consequence of the application of microelectronics;
4. the effects on job content in different occupational groups; direction and degree of the effects; the effects on the quality of work;
5. the effects on the quantity and quality of work for women and if there are similar effects on other groups (e.g. youth, older employees);
6. if a tendency exists towards the development of a gap between highly qualified and simple work regarding both job content and wages;
7. if employees directly involved with microelectronics receive higher wages for increases in productivity or if other criteria are used (e.g. qualifications);
8. if this technology has laborsaving consequences what the expecta-

tion is for the creation of work elsewhere in the economy and in which sectors;

9. the extent to which possibilities and tendencies exist to transform increases in labor productivity into new jobs.

According to one civil servant interviewed at the Ministry of Social Affairs, a reaction to these issues is expected within next few months. Three ministries, the Ministry of Interior, the Ministry of Economic Affairs and the Ministry of Education and Science, established an ad hoc committee to review the present state of affairs regarding education in the information and computer sciences and to provide advice to the Minister of Education and Science. The committee's report is a thorough review of the kind of for work which information specialists are needed and an inventory of existing courses, both commercial and non-commercial. The committee estimates that there are more than 230 courses in the information and computing sciences at nearly all levels of the education system and within private and nonprofit organizations. Of the many recommendations and conclusions one of the most important conclusions is that, in spite of a long tradition of education in this area which stretches back to 1950 and in spite of the increase in educational facilities, there are tens of thousands of people in the Netherlands who are behind in their knowledge of the information sciences. The committee recommended that the ministries of Interior and Economic Affairs take action to stimulate both the spread and level of knowledge by providing financial and organizational support.

Furthermore, there is an interdepartmental policy group with the title Policy Group Information Sciences which has established five workgroups under its auspices: 1. Science and Technique; 2. Role of Government: the civil service system as an information processing system; 3. the

Private Sector; 4. Education; and 5. International Developments. Some of these workgroups have prepared reports. In a future report for the Commission we intend to summarize the reports, and current and planned activities for each of the workgroups.

If a conclusion were to be drawn regarding the activity of the Dutch government in the area of the social-economic implications of microelectronics, it certainly is not an understatement to say that it is very extensive and intensive. While the results - expressed in the number of concrete policies - are few in number it is quite evident that the amount of preparation in policy-making has dramatically increased judging by the surge of reports and papers which have appeared, especially in 1981. There is thus every reason to conclude that the policy-making aparatus is seriously coming to grips with the social implications of the new technology.

Social groups

Trade Union position and demands:

During the previous period interviews were held with three representativs form the Federation of Dutch Trade Unions (FNV) and reactions were obtained concerning the implications of the new technology for two sectors: the service sector and the graphics industry.

In an interview with Mr. Wim van Gelderen from the FNV, concern was expressed regarding the influence of the new technology on a number of issues. First, the FNV believes that employees should be consulted during the implementation process but until now has obtained very little cooperation from employers. Unions and enterprise councils should be informed on automation projects in an early fase and this rarely happens. Firms

should take more responsibility in retraining their employees when the decision is taken to automate. In the bank sector, for example, little is done to retrain employees and consequently they have very little knowledge of new skills.

The introduction of the new technology in automation projects is done piecewise and is not implemented as an integrated whole. Management introduces technical changes by way of an engineering approach in which little attention is paid to the relationships between computers and organization; most of the emphasis is placed on the products. Those groups who are effected by the automation process should be consulted at different stages. Mr. Van Gelderen did state, however, that both unions and management are convinced that a different approach to automation is needed than in the past.

The FNV would like to see the following demands realized when automation is being considered:

1. a clear statement of organizational changes and what it means for job loss;
2. the right to obtain information about automation projects;
3. the right to negotiate the changes;
4. the right for employees to develop their own point of view regarding changes.

The FNV does not reject automation in itself but it is often implemented solely with the purpose in mind of insuring the continuity of the organization with little regard being given to both the quantitative and qualitative effects on employees. In 1980 the FNV introduced the idea of an automation tax where firms which automate would pay more taxes to be used to maintain unemployment benefits for those who lose work as a consequence of automation. Since the idea was originally proposed, the FNV

is reexamining their position. An automation tax may endanger the existence of weak and small firms, and thus poses an employment threat. The FNV is nevertheless still, in principle, a proponent of measures to compensate for job lose as a result of automation.

As a means to sensitize their members to the effects of automation, the FNV has organized an annual "Automation Day" in which the various aspects of automation are discussed.

In an interview with Mr. De Geus, a representative of the graphics union within the FNV, it was stated that consideration has been given to technical developments within the graphics industry for several years. The unions have gone along with technical developments and in doing so have cooperated with management.

There is an agreement with employers that when a decision is taken to invest in new equipment the union is to be informed of the consequences for employment, the possibility of retraining, and early retirement for employees older than 57½. The graphics industry has their own training center in Deventer where employers can be retrained; the accent in the training has shifted to the function of the computer.

There is a clear orientation to the future in the graphics industry which, according to Mr. De Geus, may evolve into an information industry tied to the media industry.

Developments in technology are closely followed. The expectation is that there will be less work which will result in either shorter working hours or a redistribution of work. One major problem, especially in the first case, will then be making agreements concerning wages. The graphics industry has, in cooperation with the government, developed a Industry Information System which went into operation in November 1981, that can be used to test investment plans. If a firm develops plans to develop pro-

ducts, analyses are conducted and advice is provided as to whether or not the plans are feasible. The purpose of the Industry Information System is to help firms avoid financial collapse.

Employers reactions

The reaction of the Council of Central Employers Organizations (RCO) to the Government's comments on the Rathenau report are summarized as follows. The RCO agrees with the Government that microelectronics should especially be seen as a challenge which brings it new chances to all of those involved, including industry, to react positively. Innovation of processes and products is needed to continue and strengthen the competitiveness of the Dutch industry. The RCO considers broad public information about the development of microelectronics of great significance in order to promote acceptance of microelectronics without too many difficulties in view of the current ambiguous attitude of public opinion towards microelectronics. On the one hand people are optimistic about microelectronics (economic recovery) while on the other hand they are frightened (privacy, employment).
Speculations about speed, importance and intensity of the possible consequences of microelectronics can only be guesses, especially concerning the quantitative effects on employment. On the other hand it is very clear that changes will take place in the composition of employment.
The impression of the RCO is that many publications about the social consequences of microelectronics are very negative. Special care has to be taken of a balanced approach of the different facets of technology assessment. As an example of an one-sided approach the RCO gave the report 'Huppes' in which emphasis is mainly on the negatve effect of microelec-

tronics. One of the most obstructing factors of the applications of microelectronics in practice is education. The reaction of the Government with regard to education is a bit reserved. In its reaction to the Rathenau report, the Government stated that a development of information science education is to be seen as a scientific study, e.g. post-academic education. It did not state if more emphasis should be paid to the technical-mathematical side of information science or to other aspects. Also, the Government did not state in what way education on other levels than above copes with microelectronics. The opinion of the RCO is that the Government here bypassed the important fact that most people who have had those kind of educations are going to be involved with microelectronics on the work-floor.

Furthermore, the RCO points out the importance of retraining and refresher courses. The RCO thinks highly of the activities of the Board of Trade, which at present subsidizes many education programs in industry.

The possibilities of microelectronics in practice are, in the opinion of the RCO, mostly to be found in improving information systems by application of this technology in information equipment and in renewing product and production processes. The application of microelectronics has to be seen as part of the innovation process in organizations. But for the innovation capacity of the Dutch industry the availability of risk capital is of great importance and because of the strongly weakened financial position of many Dutch enterprises the financial basis necessary for innovation is very weak. The switch-over to microelectronics in production processes has to be seen as a form of process innovation. The enterprises cooperating in the RCO asked that investment costs and wages, associated with innovation be made subsidiable. Further, the RCO advised the Government to classify such subsidies within the National Investment Arrange-

ment (WIR).

In addition the promotion of microelectronics is desired. Therefore, the RCO supports the idea of the Government to establish a microelectronics center. The purpose of such a center should be to provide information, reference, advice, documentation and instruction on education possibilities.

It was pointed out, however, that ideas for implementating microelectronics should also come from the workfloor and not only from management.

In an interview with representatives from the largest employers' association (VNO) in the Netherlands, it was stated that employees should become more involved in the preparation of technical change. The VNO has followed developments very closely in the last few years and has officially reacted to the various reports and through membership in other organizations have promoted research and influenced policy-making on the effects of technology on employment and the quality of work. Their position regarding the role of government is that if management and unions are unable to make agreements then the Government should play a stimulating but not a regulating role.

Labour disputes, other conflicts

The steering committee for the national payments system that is investigating the possibilities of automating payments even further between, for example, the banks and the PTT has decided not to allow the unions to participate in the committee. The unions fear that thousands of jobs will be lost as a consequence of further automation of funds transfer.

The association of unions for middlemanagement (Unie BHLP) recently expressed their objections to the fact that various groups are not consul-

ted during the preparation of automation plans in banks. Their fear is also the loss of work.

Research

Social implications

There has been a great deal of discussion on this topic in the Netherlands. While reports, like those prepared by Metra and dr. Huppes from the University of Groningen, have been produced, these are largely based on literature reviews of research which has been conducted abroad. In the Rathenau report it was stated that while the technology has been developed and applications are increasing there is hardly any data about its cultural and social consequences. Indeed, the nature of the nine issues to be addressed in the letter (in section 1 above) from the Minister of Social Affairs and Employment clearly indicates that policy-making has been hampered by the absence of empirical knowledge. In spite of this there have been a number of one day symposium sponsered by organizations ranging from the YWCA to the Foundation for Technology Forecasting (STT). Speakers have often been invited from abroad or they are high placed officials from trade unions, employers associations, government or universities.

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1. Summary

The following 2nd report on new information technologies provides a survey of activities and publications between June and December 1981.
Government activities are described in the first part. Public promotion of the development of microelectronics, which has already received considerable financial support in the past, is being reinforced. During the next three years additional 1oo million DM are to be spent each year on a special programme "Microelectronics" aiming at the promotion of microelectronics. The Federal Government has at present submitted a concept on human formation of work in the field of information technologies. This concept is to be realized in the framework of the governmental programme "Humanization of Working Life".
The development of new information technologies has also influenced the activities of trade unions and employers' associations. Especially the trade unions have shown the social consequences of the development of new information technologies in numerous publications and demanded measures to abolish negative consequences for the employees. The discussion on the reduction of working time taking place at present between trade unions and employers' associations has its origin, among others, in the job-destroying effects of the use of new technologies.
The importance of the social consequences of information technologies for research is proved by numerous publications and research projects. In addition to the fundamental research in natural and technical science the investigation of the social consequences occuring due to the introduction of information technologies is gaining more and more importance.

2. Government Activities

2.1 Promotion of Research and Development

The Federal Government wants to procure the definite breakthrough for micro electronics in the Federal Republic. Similar to the areas communication technique and bio-technology, micro electronics are to be a focus of Bonn's research promotion in the coming years.
This has been announced by the Federal Minister of Research v. Bülow. At least DM 236 mio DM will be reserved in 1982 for micro electronics of which 100 mio DM are to be used for the promotion of special product developments.
Refering to immense efforts of development in this field in Japan and the U.S.A. Bülow spoke of an "alarm signal": the proportion of intensive technology products exported by Germany would stagnate, while the import of such products would have been increased.
With the aid of the new special programme micro electronics for which 100 mio DM promotion money per year for three years has been reserved, the competetiveness shall be reinforced and in the long term places of work shall be guaranteed. A maximum amount of 800 000 DM for each firm shall be promoted with enterprises of all sizes and of all branches. (dpa of 3o.11.1981)

During a congress about "Chances and Risks of Information Technique - expecially of Data Processing Technique" the Federal Minister of Research Andreas von Bülow pointed out the great possibilities of these technologies, which can disclose production reserves as well as guarantee improved services for citizens and customers. Bigger and faster production, which can be achieved by micro electronics, disclose ever increasing new fields of application for information technique.
In the opinion of the Federal Minister of Research the further development of information processing technique and its application are difficult but solvable tasks. They require resources, which, in contrast to many others, exist and can be extensively enlarged in the Federal Republic of Germany: qualification, education, ability to organize and

willingness to cooperate. In the future the research and development policy will continue to make a contribution to solve this task. It will concentrate on focal points like, for example, the improvement of availability and reliability of programmes, which enable computers and electronic machine elements to function (software) of fundamental research and development as a basis for system technique and equipment technologies. In the opinion of the Federal Minister of Research further focal points are the sample recognition, the field of application 'office and administration', the research on effects and the necessity to make sure, with the aid of labour and social scientific complementary research, that in these developments aspects of humane formation of working conditions are timely taken into account.
(BMFT-information 11/1981)

2.2 Improvement of Labour Law-Humanization of Work Programme

- In July 1981 the Federal Minister of Research and Technology published a paper concerning the main point of promotion "Office and Administration" within the framework of the programme "Research on Humanization of Working Life". This programme focuses on the following themes: rationalization and mechanization, their effects on labour and employment, measures to humanize working life. The programme aims at:
  - reduction of stresses, improvement of professional qualifications, extension of work content;
  - investigation on the effects of office automation on the employees, in order to recognize dangerous developments as early as possible and to indicate possibilities to influece the development;
  - it shall be demonstrated in plant-level application projects, how working conditions can be humanely formed, when advanced information techniques are used without conflicting with rationalization requirements.

  Besides the improvement of existing labour conditions the preventive use of influence on the technical development is an essential aim of this promotion.

- The field of tension between humanization and rationalization with the introduction of new information technology, is dealt with in a booklet published by the Bavarian government; the title is "Rationalization in the Office - what happens to Man"? (by the Bavarian State Ministry of Labour and Social Order, Munich 1981). The central topics of this booklet are as follows: technical and social change in the office, rationalization and humanization, office systems of the future, examples of rationalization and humanization of office work.

- The Saarland Chamber of Labour (a semi-public institution) has published a booklet concerning the "Possibilities of Action for the Shop-Committees when Office and Administration are Rationalized by Means of Visual Displays and Computer-tided Information Systems" (Saarbrücken 1981). In this booklet information is given about stress and risks to health in specific labour conditions, social consequences of rationalization, legal possibilities for shop-committees to be able to influence the development in the interest of the employees. Furthermore, the booklet includes check-lists and forms to provide the shop-committees with working aids.

2.3 Safety and Health

- The Federal Institute of Labour Safety and Accident Research (an administrative department of the Federal Ministry of Labour) has published a literature list, dealing with the labour conditions at visual-display units (Dortmund, June 1981). In this booklet the most important investigations and publications concerning labour conditions at visual displays are compiled and briefly described.
- The Federal Ministry of Research and Technology has published the results of an investigation on "Typing work in Federal Administrative Authorities" in the 16th volume of its book-series "Humanization of the Working Life" (Campus-Verlag, Frankfurt, New-York 1981). In this book the results of an investigation on stress at typing-work places as well as the results of experiments with alternative forms of organization typing jobs are presented.
- The German Institute of Standardization (DIN) has published norms for work at visual displays (DIN norm No. 66234). The norm include both technical details and indications regarding working forms and job requirements. It is aspired to adapt technical code values of visual desplays to the abilities of man; i.e. physiological conditions (eye, ear and sense of touch) as well as cognitive conditions (maximum amount of information, correct realization of the given information.

3. Social Groups - Industrial Bargaining

Recent publications show clearly that the discussion about the social consequences of the spreading of information technologies is encouraged particularly by the trade unions. The main issues are the risk of unemployment and the strains of work.

In the field of public services the collective bargainers signed a collective bargaining agreement about extra leave due to shift work and irregular working time. According to this collective bargaining agreement the employees of the Federal Government, of the Länder and of the local governments receive up to five days extra leave. Thus strains emerging due to these forms of working time are to be compensated by measures which improve recreation. These measures which improve relaxation also contribute to an improvement of the job situation.

In the metal industry, conflicts concerning the reduction of working hours are to be expected. The executive committee of the metal workers union discussed, among others, strategies for the forthcoming collective bargaining at a closed meeting in September 1981. In this context the executive committee also dealt with the reduction of working-life by a collective bargaining agreement. The aim is to enable employees to retire before they have reached the age limit of 65 years, their wages being payed by the company until the have reached the age limit. This collective bargaining concept is being discussed by the trade unions at present with special regard to humanitarian effects and effects on the labour market. The employers' associations of the metal industry have already pointed out, that such an agreement cannot be financed.On the issue of working time a possible conflict is already preprogrammed.
The importance being attached to the social consequences of the introduction of information technologies by the trade

unions,is demonstrated by the following three publications by the union "Öffentliche Dienste, Transport und Verkehr" (union for those employed in public services and transport). A booklet published in May 1981 deals with the development of electronic data processing based on microelectronics ("Electronic Data Processing, Micro Processors/Micro Computers", Stuttgart 1981). In this booklet general tendencies in micro electronics are described with regard to their consequences on the employees (esp. their effects on employment). Moreover, the strategic positions of employers, trade unions and government are presented.
Another booklet deals with the development of electronic based information systems ("Electronic Data Processing/ Information Systems, Stuttgart, December 1981"). In this publication the importance and function of technical based information systems are described and their consequences for the employees are explained. Typical forms of information systems and fields of application are represented in the appendix. Moreover the attitude of the union towards electronic data processing is described and explained.
The issue of a special booklet is "Rationalization in the field of savings-banks" (Stuttgart, October 1981). The booklet includes conditions of rationalization in savings-banks, planning and preparation of rationalization measures, rationalization measures in selected fields, assessment of this development and the unions' demands, execution of the unions demand.

4. Research

4.1 Conferences

In the field of research, tendencies to reinforce the investigation of the social implications of information technologies can clearly be recognized. This is proved by a series of labour conferences dealing with different aspects of problems concerning social consequences of information technologies.

- Technical discussion "psycho-mental strains", carried out by order of the Federal Minister of Research and Technology (Project Agency for Production Engineering, development note PFT/E 4, Nuclear Research Center Karlsruhe, September 1981). Ergonomists, industrial psychologists and industrial sociologists took part in this technical discussion. Starting point of the technical discussion was the fact, that obvious shifts in the strains of work occur due to the increase in information technologies. Instead of physical strains the share of psychic and mental strains is increasing considerably. This applies both to data processing in administrations and to production. The aim of the professional convention was to provide a survey over level and deficits of ergonomic industrial psychological and industrial sociological research. In addition to scientists from the corresponding special branches of study, representatives of employers associations and trade unions held lectures on this topic. The result of the technical discussion can be summarized: The strains occuring in connection with data processing can be understood only by interdisciplinary research concepts; compared with the level of technical development and the consequences for the employees both the theoretical and methodical concepts of research on strain are still quite underdeveloped; deficits in research can only be eliminated if the interdisciplinary field research is reinforced; the access to factories has proved to be a considerable obstacle.

- Two congresses dealt with the subject information technologies and automation: "Automation of Manufacturing" (May 1981 in Böblingen) and "Flexible automated handling and mounting systems in practice" (June 1981 in Frankfurt). The labour conferences were both dominated by predictions about the technical development that can be expected, but was also a number of problems concerning the social consequences for the employees were discussed. The following problems were well to the fore: personel reduction and unemployment, increase in shift and night work, increase in psychic strains, loss of qualification, control of the employees' performance and behaviour. Also in these two labour conferences representatives of employers' associations and trade unions took part, in addition to the scientists. (A survey report about these two conferences is provided by the German Federation of Labour, Editor, AFA Information 4/1981, pp 12-20).

- Computer and labour market, a conference under participation of scientists, industrial experts and employees. Between 6th and 8th November 1981 a labour conference took place in Dortmund entitled "Computer and labour market in the eastern Ruhr district" - a labour conference concerning the consequences of the use of computers on the development of regional structure and labour market". It was organized by a study group called "Computer and Labour", an institution of cooperation between the University of Dortmund and the German Federation of Labour. The concrete reference to work and employment and the incorporation of employees and industrial experts into the discussion process, it must be pointed out, was an important quality of this conference. This was possible because the concrete problems were discussed in eight groups. The following aspects were discussed: stage of development and fields of application of information technology, plant-level and regional conditions of economical structure effects on the working conditions, job situation and possibilities for the employees to act. The following fields of

application were discussed in the working groups: construction and preparation of work, handling, mounting and transport in manufacturing, control and supervision of manufacturing processes, computer jobs in banks and assurances, in wholesale and retail trade, text processing in administration, information transmission by telecommunication, personel control and personel planning. A final report has not yet been submitted, but interesting results can be expected.

4.2 Research on the social implications of the introduction of information technology

The degree of importance, which both the sciences and the trade unions attach to the social implications of information technology, can be derived from the latest publications of AFA ("Working committee for Labour Studies"): "AFA-Information", a journal of the West German trade unions.

- Number 2/1981 includes an article by Peter Müller-Seitz "Technologie und Ökonomie - ein Beitrag über ihre Interdependenzen aus arbeitsökonomischer Sicht" ("Technology and Economics - a report concerning their interdependencies from the labour economic view") (pages 9-29). The report gives a survey of the recording of the correlation between technical development and social implications as seen from the point of view of factory management. The topics are: present situation and development tendencies of highly developed production technologies, impact of technical progress on human work, impact of technical progress on the factory, factory management concepts in order to influence the social consequences.

  In the same leaflet on page 30 reference is made to the research project carried out by the union "Technological change in Commerce". The subjects of the project are as follows: stocktaking of the technical development, implications on the employees, possibilities of social formation via plant-level and beyond-plant-level trade union policy.

- In number 3/1981 Walter Knepel and Lothar P. Schardt report

on the topic "Introduction of computer-aided clerical work and its effects on plant-level employment and income conditions" (pages 3-22). The essay deals with the following themes: problems of the entire contemplation of the social implications of computer-aided information systems, introduction and further development of computer-aided clerical work by means of an operational case study, description of the effects of computer-aided clerical work on the plant-level employment situation, effects of computer-aided clerical work on plant-level income conditions.

- In number 4/1981 Roland Schneider reports on three congresses, which dealt with the development of production automation and its social consequences (compare 4.1 of this report). Helmut Rose gives a critical representation of computer technology and its implications on those employed from the working people's point of view (pages 21-25). He describes the working men's risks (loss of workplaces, reduction of income, health risks, loss of qulification, loss of competence). The rise of new stress (e.g. psychomental stress), preventive shelter measures (shortening of working time, limitation of the working time at programme-controlled machines, regulation of breaks, reduction of shift work).
  In the same number Klaus J. Zink gives a survey of the momentary situation regarding the labour scientific discussion of information technology (pages 26-28); the article deals with questions of changing stress, of changed requirements of human qualification and abilities, of labour market effects and of the speed of diffusion of information technology.
- In number 5/1981 Helmut Rose reports on the innovation advisory board of the Industrial Union 'Metal': "Labour orientated innovation Policy and Advice on Technology for Employees" (pages 16-30). The article comprises of two focal points: on one hand the importance of technology transfer to avert risks for working men and on the other the possibilities to use advice on technology as a

representation of the working man's interests.

- In the same number Erich Ott gives a survey of the momentary state of discussion regarding the theme job-sharing (pages 3-15). The report has the following topics: the job-sharing model in the USA, job-sharing models in the Federal Republic, implications of the introduction of job-sharing models on the labour market, implications on working and living conditions. The article presents the model of the employers' association of the chemical industry as well as the outline of the Christian Democratic Party and the trade-unionist criticism of the existing job-sharing models.

- In the October issue (5/1981) the journal "Progressive Management and Industrial Engineering" (editor: 'REFA'-association for work studies and factory organizations) specially deals with questions of social consequences of mechanization and rationalization.
  The topic "Rationalization between Efficiency and Humanity" (pages 339-349) is discussed by Peter G. Rogge. The author gives a retrospect of the first phases of industrialization; with this in mind he discusses the specific importance of the momentary phase of automation and represents the general consequences of the development: shortening of the production time of capital goods, effacement of the dividing line between producers of equipment and of machine elements, extermination of specific old qualifications and formation of new qualifications. The author recognizes four suppositions for an appropriate steering of the technical progress: The efficiency of automation depends on whether investments in new technologies can still be increased in future. In the long run high wages can only then be achieved, if productivity of labour is increased, which presupposes increased investments. It is not sufficient, to take over technical know-how, moreover the various industry and service branches have to make extensive use of new technology. The solution of human problems depends on the way in which futur automation must be seen: as a chance for efficiency or as a threat against humanity. It is important to improve the ability of those employed. In the end the author states, that it is necessary to make extensive use of the progress.

In their article "Stress Reduction for Shift-Workers" (pages 347-352) Reiners, Schweres, Streich write about the possibilities to reduce stress of shift work and the implicated costs. With the spreading of information technology the proportion of shift work increases. The authors present two models to reduce stress of shift work. Stress reduction is to be achieved by alternative division of shifts during the day. The authors take into account, the realizable tendencies towards the working-time of shortening and "sliding retirement" of older employees from the factory. The authors come to the conclusion, that only combined ways of procession lead to positive effects.

- The results of an investigation on "Economic and Social Consequences of the Use of CNC-Tool Machinery" has been published by the Rationalization-Board of the German Economy ("Economic and Social Consequences of the Use of CNC-Tool Machinery", editor RKW, Eschborn 1981, Order-No. 758). The publication represents figures concerning efficiency and labour productivity, and deals with questions concerning wage-payments and the qualifications of machine workers.

- Two publications are concerned with the problem of visual display work.
  Sedeno-Andres, F.: Visual Display Working Places, Comparison of Valid Factory and Service Agreements, Berlin 1981.
  Seitz, D.W.: Labour Organizational Problems of Visual Display "Work towards a Reduction of Monotony and Stress, Dortmund 1981 (Society of Labour Safety and Humanization Research).

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Introduction

The present report attempts to survey the state of information and action in Italy upon the economic and social impact of micro-electronic based information technology, with particular attention to the activities of Public Agencies, Research Institutions and social groups. The information reported here concerns in part aspects already mentioned in a previous report (August 1981); an effort is being made, however, to complete the range of the survey and to give a basis of comparison with the analyses concerning other countries.

It should be acknowledged that in many ways Italy has been suffering a delay in the perception and the response by the relevant political and social forces to the implications of the diffusion of the new information technology. More recently however, the level of awareness of the problem has been steadily increasing, as can be witnessed, in particular, by the growth of research output on the subject, while there still remains a lack of sufficient initiative at the level of operative or legislative action. It must also be understood that the current debate on macro-economic conditions and policy is somewhat dominated by the dramatic figures of a general employment crisis. Technological or other structural factors, in such a context, are often quoted as a possible additional factor in worsening the longer term employment prospects, rather than analysed in detail. The responses envisaged at the level of Labour or Industrial Policy, although elaborated in a more general framework of intervention towards situations of general or sectoral crisis, often contain specific provisions or implications in the event of technological impact. Our assessment of these more general policy initiatives will be limited, as far as possible, to these implications. It is to be noted also that any quotations which appear are intended as a free and sometimes abridged translation of the original statement.

Government Activities

a) Promotion of R & D

Within the context of the Law 675 of 1977, which has represented the principal instrument of orientation in Industrial Policy in Italy during the past years, the financing of research projects of particularly relevant national interest, (Progetti finalizzati - projects mainly concerning objectives in technological improvement, energy saving and biomedical research) is provided for. The general coordination is assigned to the Consiglio Nazionale delle Ricerche (CNR), while the execution of the projects normally involves a pooling of academic and other public or private research institutions. A "finalised project" on Information Technologies "Progetto informatica" was approved in 1979 and some 12 billion lires have been allocated up to now to research programmes in this field/ The time-span of the projects is 3 - 5 years. The global project on Informatics is articulated into 3 main fields (P1, P2, P3) with parallel objectives.

P1 Information systems architecture, with particular reference to distributed systems.

P2 Models and solutions for the "computerisation" of the Public Sector. Relevant initiatives within this field include the project "Comuni" (systems support for local administrations), "Lavoro" (general and regional coordination of the information network on labour markets), "Sanita" (systems support for Health Services).

P3 Methods and systems for the control of industrial processes.

The projects are also meant to favour development initiatives by the national industries operating in hardware and software production and servicing, and the firms often contribute, with their own research staff and additional funding, to the implementation of the projects. However, the "finalised projects" are intended to concern mainly fundamental research, while applicative or market developments by firms should be financed through the channel of the so-called Funds for Applied Research (Fondi per la ricerca applicata), which provides capital grants or interest rebates to firms through the financial mediation of the Istituto Mobiliare Italiano (IMI). Reports in the state of advancement and further programmes within the project for 1981 are made available by CNR.

b) Labour Law

A global project on the reform of the labour legislation concerning the organization of Employment Services, the management of mobility and unemployment compensation has been under discussion at the Parliamentary Commission since December 1979 (normally

referred to as Disegno di Legge n. 760), without ever reaching a final approval. The purpose of the project is essentially one of guaranteeing a more ordered legislative framework in this field, characterised by the proliferation of different instruments (ordinary and "special" unemployment compensation, ordinary and "special" regimes of "Cassa Integrazione Guadagni" - Wage Integration Funds). Another objective is that of reducing the importance of the "Cassa Integrazione", which has emerged in the last decade in Italy as the main instrument of compensation for the loss of work, going far beyond its original purpose of guaranteeing an income integration for workers on short-term redundancy while keeping, formally, their status of employment within the firm. According to the project, workers who are made redundant because of situations of sectoral crisis, or because of technological and organizational factors within a firm, and for whom there are scarce prospects of an effective re-utilisation by the firm within a reasonable interval of time, should be admitted to "mobility lists" organised within a regional framework. A worker, under this regime, is to be allowed an unemployment compensation of 80% of the last wage received up to a maximum of 24 months; he is obliged to accept a job offer of a comparable skill level within a radius of 50 km from his home and also to take part in retraining schemes, or other initiatives organized by the regional employment commission. The possibility of employing workers on mobility lists for short-term projects of public works or service is also mentioned. While the system of the "Cassa Integrazione" is accused of inhibiting inter-sectoral labour mobility and of protecting unofficial employment, the new system is meant to limit the "discouragement" and the "diseducation" effects for workers in conditions of technological or structural unemployment.

c) Safety and Health

The Law n. 833/1978, setting up the organization of the National Health Service ("Servizio sanitario nazionale") includes provisions concerning safety and conditions of work (in particular art 22, 23 and 24). A new Agency, under the control of the Ministry of Health, is to be constituted ("Istituto superiore per la prevenzione e la sicurezza del lavoro"), concerned with "research, experiments and elaborations of safety of working conditions in connection with the technological evolution of plants, machinery and processes, and with the determination of safety regulations with reference to the homologation of machinery, plants, instruments". The Agency should provide research support and consulting for the local structure assigned to the control of work and environmental conditions, to be organized within the territorial units of the National Health Service ("Unita sanitarie locali"). The scheme however, is not yet operative and the effective control on working conditions is still done by Inspectors of the Ministry of Labour, who should be reallocated in the future to the new national and local structures. The Trade Unions have recently been exercising pressures on public bodies for the implementation of the Law and the intervention, with specific reference to the impact of new automatized processes. More detail on this point, will be given in a later section.

d) Education Policy

Within the state system of industrial and commercial secondary schools (Istituti tecnici di Stato), conforming to programmes established by the D.P.R. 28/2/1972, n. 123, experimental courses providing technicians with specialization in information technology ("Perito informatico") and accountants with Programming ability (Ragioniere programmatore) have been running since 1975. In 1980 some 50 technical secondary schools throughout Italy were providing courses within these areas of specialization. The experimental phase has been judged a success, and the new courses are being given a definitive status as official degrees. The technical secondary schools, covering a period of study of five years, provide an intermediate degree between short term professional courses and the Universities. The Ministry of Education has implemented research upon the absorption possibilities of these professional figures and is planning to reach a number of some 600 operating classes for a total yearly student intake of about 10,000. An expansion of the teaching staff is also forecast, and teachers' training classes have been organized. At the present teaching programmes normally provide a minimum of two hours a week of theoretical classes during two years on Informatics and Programming languages, plus practical training on computers in a final year. The effective quality of the courses has a wide range of variability among schools, and only a few of them can be said to be endowed with adequate teachware. Outside the system of Technical Secondary School, short-term, informative classes on computer technology and applications have been occasionally organized in "Licei", secondary schools normally leading to University courses. Finally, it should be mentioned that a wide project of reform of the system of secondary education is at the present in a phase of preliminary discussion. According to a project anticipated by the Ministry of Education, secondary education should be based on a comprehensive school basis, (abolishing the present distinction between "Licei" and "Technical Schools"), with two years of basic common teaching followed by three years of specialization in a range of 14 options. Information technologies would enter at a level of non-specialized sensibilization in the basic teaching area, and at the level of specialized subjects for the options in"Electronics and Informatics" and in "Management Economics"*

* More details on these points are available in "Indagine conoscitiva sulla informatica", studi e documenti degli annali della pubblica istruzione, n. 11 Rome 1980.

e) Training and re-training

The main legislative framework for professional education and training schemes in Italy is the Law n 845/78 (Legge quadro sulla formazione professionale") , which provides the general criteria on which applicative programmes, normally delegated at a regional level, are to be based. Most Regions have by now established local legislative and operational frameworks although with differing degrees of effectiveness. Some of the institutions considered by the Law 845 and its regional developments may interest us in the sense that they connect with the assessment of the transformation of productive processes and their consequences on the structural characteristics of the demand of labour. We may synthesize four levels of relevant initiative assigned to public agencies at national or regional level:

1) The planning agencies, concerned with the provision of quantiterative and qualitative programmes in manpower training within the context of a general economic forecast.

2) A supporting structure of "Regional Observatories" on the evaluation of the labour markets, with attention to structural and territorial analyses of demand of labour.

3) The stipulation of "conventions on training programmes" between Regional authorities and enterprises.

4) The definition and revision of the classification of the professions and skills.

The programme on "Regional observatories" on labour markets is being co-ordinated by ISFOL ("Istituto per lo sviluppo della formazione professionale dei lavoratori"), the agency under the authority of the Ministry of Labour which is officially charged with problems of manpower-forecast and professional education policy*. The definition of "skill families" and the related analyses of employment structures in processes is another assignment for ISFOL, which is working on classification procedures defining skills within specified qualification levels ("fasce di qualificazione"). This methodology, based upon a distinction of four fundamental levels of professionality, has been applied to studies of work organisation and skill figures in the informatic processes and modern office organisation.

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* A bulletin "Osservatorio sul mercato del lavoro" is regularly published by ISFOL.

The definition of skills within the "fasce di qualificazione", within an industry or process, has practical implications on the actual training programmes: the aim is one of passing from more narrowly defined skills and relative training to more comprehensive programmes allowing a polivalent formation within a skill family.

Many training schemes at regional level have utilized sources of financement deriving from European Communities Social Funds.
A quantitative and qualitative assessment of specific programmes would require a more extensive survey going beyond the scope of the present report. Finally, it should be observed that often, confronted with the many inefficiencies of the public education structures, major private and public industrial or financial groups have developed their own initiatives for professional training, in particular for high level cadres. For example, IRI and ENI organize classes, normally involving one semester or a year, to which newly hired university leavers are sent. The lack of sufficient information and training on programming and electronic applications is the major gap in University formation of potential administrative and technical cadres, which these classes try to remedy partially.

f) Sensibilization, broadcasting, etc.

As an "indicator" of the sensibilization of public opinion on information technologies we have examined the programmes of State television (RAI) in the last two years, through the computerized catalogue by subjects of transmissions. Although there was no systematic or specific series of transmissions on this subject, computers and information technologies were mainly considered in transmissions organized by the Department of Educational Programmes (DSE), for example, in the context of orientation programmes for choice of school and careers. The attention paid to the problem is shown to be increasing by the fact that the hours of transmissions on related subjects in 1980 reached more than double those of the previous year. The partial figures for 1981 confirms this tendency. As well as educational programmes, informative services have been given on "robotics" and telematics as "specials" by the News Services Divisions of the three state T.V. networks. Some 315 minutes of transmission were dedicated during the first 7 months of the current year to subjects connected with information technologies, (including educational programmes).

Social groups - Industrial bargaining

a) Trade Union positions and demands

"Nowadays there is a strong temptation in some sectors to say stop to technological progress. It is a dangerous but always present temptation for Trade Unions. The Italian Labour Movement, unlike that of many other countries, has usually managed to resist this temptation, and it should continue to do so".

This statement, from the concluding address by L. Lama, Secretary-General of the CGIL at the conference on "Sindacato, informazione e comunicazioni di massa", (Unions, information and mass-communication, Rome 14/5/80), is indicative of a generally open attitude, at least at a theoretical level, of the Italian Unions vis-a-vis technological innovation. In all the relevant occasions of discussion of matters of Industrial Policy, (e.g. the Parliamentary hearings on Electronic Industry and applications in 1977-79), Trade Union representatives were ready to stress their understanding of the need for innovation, and they have always been sensitive towards the argument that national industries should avoid further departures from international trends in process and product innovation.

It could be that this attitude reflects, to some extent, a delay in the perception of the potential amplitude of the occupational and organizational implications of the "micro-electronic revolution". Only very recently, at least so it seems from the impression received from current publications or other public statements, the importance of the assessment of technological trends for the medium term prospects on the quantity of employment has become a wide-spread concern, with at least two years of delay with respect to the experience of other major European countries.

It is clear that with the official unemployment figure at over 2 million, and with unprecendented totals of workers under the "Cassa Integrazione" regime, (this would mean some 300/400,000 more unemployed, although formally they do not appear as such), the general principle of a "favourable attitude" towards innovation might in some cases be contradicted in practice.

There are a few cases as far as I know, of attempts to limit contractually the impact of innovation linked to the application of micro-electronics, (one possible example is that of the printing industry, on which more will be said later); in other cases, when the labour-saving implications of the new processes were clear (e.g. the case of Olivetti), the strategy has been essentially one of pressing for additional "extensive" investment, public support, etc. The emphasis and

insistence by the Unions, in the more recent contractual rounds, on the definition and formal inclusion in the contracts of "information clauses"on employment and investment policies by the firms, should reflect the Unions hopes of a possibility of bargaining over medium term employment prospects balancing availability on Labour mobility and local reduction of manning levels with demands for compensative initiatives elsewhere, with the "Cassa integrazione" system acting as a temporary "shock absorber". In the 1979 round the main national contracts included information clauses (currently called "prima parte dei contratti") defining regular panel meetings at national and regional levels between employers and Union representatives, to be held at the beginning of each year on investment and employment prospects for the year; "information rights" were also defined at firms' level (for enterprises employing more than 200 operatives), covering information on technology, work organisation, labour mobility, decentralization. It must be observed here that the attitude of the employers towards the effective operation of these clauses has been cool.

In 1982 all the major industrial contracts, (engineering, chemical, textile, etc), are to be renogotiated and most sectoral organizations are planning congresses at the beginning of the year, for the definition of platforms. It remains to be seen how the deterioration of the general employment prospects will act upon negotiation attitudes.

A detailed report on the state of debate of the reduction of working time would require more space than is justified here. A progressive reduction in working time is obviously seen as the strategy in the medium run for couteracting labour saving trends; CISL, has often shown more radical attitudes towards a generalized 35-hour week claim, while CGIL and UIL tend to favour differentiated approaches "also considering situations which are specific to a sector or to a firm". The prevalent position nowadays is one of seeing the 35 or 36 hour-week as a goal to be reached before the end of the present decade, while the pace of advancement is mainly made to depend on comparability with international trends, especially within the European framework.

At the level of intervention on work organization and environment, Unions have often acted urging a more effective control by health service officers or Inspectors of Labour on the health implications of technological innovations. An unified agency of CGIL-CISL-UIL, CRD (Centro ricerca e documentazione) centralises information and problems arising from workers' groups on conditions of work and undertakes research projects and/or interventions in this field. Monitoring groups on robotization in industrial processes and on informatization of offices have been constituted within CRD.

b) Employers' reaction

On the occasion of the 1976 and 1979 contractual rounds, employers' organizations took rather reluctant attitudes towards the inclusion and the scope of "information clauses". The general position is that "investment policy is not a matter for bargaining, but an autonomous field of choice for the entrepreneur". The effective implementation of the clauses has been resisted at the level of single firms, rather than at the level of general panel meetings. The Confederation of Industry ("Confidustria") while regularly publishing macro-economic assessments and forecasts does not normally pulicize case-studies on individual firms. A recent "white - book" on Technological Innovation by the Confindustria essentially emphasises industrial policy and trends in international competition.* A free report from the interventions by V. Merloni (President of Confindustria at a recent debate held in Rome (2/12/81) on the occasion of the presentation of the research on "Transformation in employment patterns induced by technological evolution" by FAST (Federazione delle Associazioni Scientifiche e Techniche) should be indicative of the prevalent attitudes on the employers' side:

"We are convinced that more employment has been lost, and will be lost, by lack of competitivity than by technological improvements in themselves"; "the conditions of international competition today obliges us to follow all possible attempts to reduce costs".

c) Labour disputes and agreements.

As an example of "technological agreement" with clauses of control on manning implications of information technologies, more will be said about the case of printing in a later section. Here we will briefly report on the case of Olivetti, which assumes particular relevance as it concerns the major producer in Italy of computing instruments and one of the few examples of an Italian firm operating in an advanced framework to international standards. From 1978 to 1980 Olivetti nearly doubled its total turnover, with good records of profitability, while reducing its workforce in Italy by some 15%. The success has been attributed to the management's firm policy on innovation and industrial relations.

In 1977 the Olivetti management had announced a general plan of reorganization of its activities, which implied an immediate reduction of operatives of some 3500 units in Italian factories,

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* Confindustria - direzione rapporti economici "Libro bianco sull'innovazione tecnologica", Rome, May 1981.

mainly because of electronization of office machinery components. The opposition by the Unions led to an extended conflict, which was formally concluded by an agreement in December 1979. The State Authorities were directly involved in the composition and the final text of the agreement includes a memorandum by the Government stating intentions on the financement of development projects, public demand and initiatives on professional instruction and training which are likely to improve the employment prospects in the medium term. Although compulsive dismissals were eventually avoided, the extensive application of Cassa Integrazione, early pension schemes and the non-replacement of natural turnover has led the firm to reach its objectives in manpower reduction in a short space of time. Only at the higher levels the trends in employment were not negative. The Olivetti management also agreed to reconsider reabsorption of displaced workers, in particular for its Southern Italian plant at Pozzuoli, at the "moment of effective operation" in the programs of expansion of public demand and to support the organization of retraining courses organized by Regional Authorities.

Another case, in which labour-saving brought on by new technologies was successfully counterbalanced by the growth performance of the firm, is that of Aeritalia of Pomigliano D'Arco (Naples) where a dispute in 1979 originated in connection with the fear of the labour-saving implications of the introduction of computer-aided design. The success in development initiatives (e.g. partnership with Boeing for production of aircraft components) has allowed in this case the preservation of employment levels. It is in those sectors where improvements in electronic technology occur in the context of unfavourable market trends or declining competitivity that the consequences on employment are severe. It is estimated that some 3000 jobs have been lost in the sector of civilian electronic products in about a year. (T.V.sets, etc.), with disputes more often leading only to temporary extension of "Cassa Integrazione" regime and postponement of the date of definitive unemployment.

d) Other organizations

A rather short-sighted attitude towards information technologies was still prevalent among political party circles until recently, with the debate being almost totally concentrated on sectoral policies for the national electronic industry. As an example of the prevailing attitudes, we may quote a book by P.Brezzi*, who is responsible for electronics at the industrial policy group within the Direction of the Italian Communist Party, which is rich in information and proposals for the electronics industry itself, but completely lacks general attention to the implications of its applications in other sectors. However,

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* P. Brezzi, "La politica dell'elettronica", Editori Riuniti, Rome 1980

at least the awareness of the problem has been increasing since 1980. Research structures within the PCI or with similar sympathies, have been active recently;*a conference organised by the Italian Union of Chambers of Commerce on "Microelectronics and Society",** was a good occasion for monitoring opinions among leading political operators. Independent and "radical" economists' and sociologists' groups have been sometimes more prompt in undertaking documentation activities than "official" parties' structures have. ***

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* For example, a report by CDRL ("Centro Documentazione e Ricerche Lombardia) on "Sfida elettronica" is announced as forthcoming.

** "Microelettronica e società, una sfida politica per gli anni '80", published in Mondo Economico, Supplement,June 1981; see in particular the interventions by V Scotti (DC), former Minister of Labour, and by De Michelis (PSI), Minister for State Industrial Holdings.

*** see, for example, "Tecnologie elettroniche e organizzazione sociale" in "Sapere", n. 816, January 1979.

Research

a) Technical R & D

The most relevant programmes on technical R & D are being developed within the context of CNR "Finalized Projects" on Information technologies, on which we reported earlier. Here we may quote some of the CNR affiliated Research Laboratories, apart from University Institutes, actively engaged at the level of information systems analysis: CNUCE (Centro Nazionale Calcolo Elettronico, Pisa); CSATA (Centro Studi Automazione e Tecnologie Avanzate, Bari); IASI(Istituto Analisi Sistemi Informativi, Rome); CSEA (Consorzio per lo sviluppo della Elettronica e dell'Automazione, Torino).

b) Economic and Social Implications.

Although to our knowledge there are no examples of comprehensive surveys on the economic and social consequences of the microelectronic revolution, the research output has recently been on the increase. The results of an extensive research programme on "Transformation in employment patterns induced by technological evolution", coordinated by FAST, have recently been presented in Rome, ("Le Trasformazione occupazionali indotte dall'evoluzione tecnologica" FAST, Milano, Jun, 81). It consists of a general report, plus several sectoral analyses and case studies on applications of new technologies (covering petrochemical processes, "robotics", banking, textile, "autonics"). It is significant that the activities of research promotion by FAST, (the Association of Engineers and Technical staff) in this field have now been oriented in assessing the social and organizational consequences of the new technologies, after having produced, in the recent past, valuable sectoral surveys on the state of electronic industry in Italy. *

The implications of the introduction of "robotics" on industrial employment and work organization is another field on which there is an appreciable level of research and knowledge in Italy. The report on "Robotics and Employment in Engineering Sector" under the auspices of Intersind and coordinated by PROSPECTA **, gives quite a detailed description of the modes

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* "Rapporto sulla microelettronica nazionale", FAST, Milano, 1980

** "Robotica ed occupazione nel settore metalmeccanico", partially published in "Quaderni di industria e Sindacato" Jan-Mar 1981

of operation of "robots" in automobile and electric appliances sectors, with an evaluation of potentials in the reduction of direct and indirect labour requirements. As an example of a Research Institute mainly interested in the organizational aspects of work processes we may quote RSO (Istituto di ricerca intervento sui sistemi organizzative, Milano), which has produced analyses in modifications in job design and content with the introduction of new information processing devices*. Skill requirements in informatized processes are currently being analyzed within the institutional assignment of ISFOL in order to define "skill families" with the aim of organizing training programmes.

Research structures within the Trade Unions have not produced original research output on the subject in Italy, in our opinion; there is, however, increasing attention to the implications of technological innovation at the level of the general assessments of working conditions. **

ISRIL (Istituto Studi Relazioni Industriali e Lavoro, Rome), has produced forecasts on the absorption opportunities in the Private and Public sectors for technicians with informatic skills, which were utilized by the Ministry of Education in the definition of programmes of technical education in this field.

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* See, for example, the chapter on "Trasformazioni nel lavoro impiegatizio" in Primo Rapporto della Ricerca sulle trasformazioni organizzative in Italia", Milano, Feb 1979.

** See, for example, some of the contributions in"Qualità del lavoro e dello sviluppo", Dossier N 7, Editrice Sindacale Italiana, Roma 1979.

Experience in specific sectors

a) Offices

It is almost impossible to give a quantitative assessment of the expansion of "office automation" technologies and its impact on employment, while there is avaiability of sociological or organizational case-studies, on which references were sometimes given in earlier sections. Details of the expansion of demand for informatic appliances for offices (word-processors, centralized and distributed computing and processing units, etc) can be extracted from market research surveys implemented by specialized firms. We can get extensive information on technical and market trends for office automation technology from the documents presented at a meeting organized by AICA (Associazione Italiana di Calcolo Automatico) in occasion of the Exhibition of Office Fittings in Milan (SMAU, 18/21 September 1981), which gathered representatives of major operating firms, as well as external experts. A survey on the diffusion of office automation devices based upon a sample of some 1200 offices in different operating sectors is being implemented by two specialized consulting firms (Demoskopea and Sisdoconsult, Milan).

b) Printing, copying. *

The case of printing workers is of particular interest as an example of the explicit bargaining of employment levels and of skill-designs in face of radical technological changes. The transformation from traditional printing technologies (lynotypes, etc.) to the computer aided photo-composition techniques is a process which is almost accomplished now in the major printing shops in Italy, (it is estimated that by 1980 some 80% of the daily newspaper printing shops had adopted photo-composition processes). A case study, with the description of the organizational changes, has been implemented by FILPD-CGIL trade-union staff at the Rizzoli-Corriere della Sera Group, the largest newspaper editing firm in Italy. It emerges that the job-content of the traditional poligraphic worker has been radically affected, with the virtual disappearance of many traditional skills.

The "line of defence" of the Unions in face of these changes has been essentially one of preserving as far as possible the "job-area" of the printing workers, in particular opposing the possibility of direct inputation of texts by journalists and correspondants for final composition purposes (e.g. direct digitation, by the journalist, at a video word-processor terminal, of the text which will be automatically composed by the computer according to printing format requirements).

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* This section mainly summarises a text already published as an appendix to a previous report for EPOS (Bulletin n 1, Nov 1981, pp. 89-90).

The final inputing of the text, according to explicit clauses in the 1977 and 1979 National Contracts, has been preserved as a job-area for graphical workers, and linotype operators have been retrained, through paid retraining courses of three months, on an average, to work with the new composition terminals.

Further progress in the "system integration", e.g. extension of "on line" connections with external correspondants, laser applications in printing technology), may further reduce, if fully implemented, the residual job area of printing shop workers. The present Nationl Contract for printing workers (Contratto dei Poligrafici, validity three years from January 1979), contains explicit technology clauses concerning prior information and bargaining on technological improvements and investment projects. A joint commission among representatives of the publishing companies, of the journalists and of printing workers' unions meets every six months at a central level, and regular panel meetings are also provided for at a local level. Translating and summarizing the most significant points of the agreement (from the art. 15 of the 1979 Contract), we may read:

" ..... in order to safeguard the employment and the professional status of the workers, the organizational changes of the productive cycle of the newspaper, consequent to the adoption of new technologies, must not determine improper redistributions of functions between jouinalists and printing workers".

"Possible redundancies of manpower will be dealt with in principle: a) through the abolition of any overtime performance; b) through the utilization of the normal workers' turnover; c) through the application of the measures provided by the Law on the Publishing Industry and within a global bargaining with the workers' organizations"

The strategy of defence of employment levels appears to be, from the text, typically "Italian" in the sense that it relies mainly upon restrictions of labour supply (overtime, etc.) and upon some form of public financial aid for crisis situations (the reference to the financial provisions of the Law on the Publishing Industry, which, by the way, is still in discussion and not operative).

c) Banking

The Banking and Finance sectors have been, perhaps, the

major buyers of Information Technology in recent years in Italy, accounting for some 45% of the total investments in computing and data processing units in the seventies. Information Technology has been introduced extensively both at the level of the "terminalization" of the counter services and the level of central management operations (Register of the customers, credit information, etc.).

There is a contradiction between the labour-saving implications of the new technologies which were underlined in some studies and the employment record of the Banking Sector in Italy, which increased the number of its operatives by about 60% from 1970-1979. The exceptional growth of the turnover of Banking services in Italy may certainly explain this constantly positive occupational balance, but it was some times affirmed that the absence of an effective inter-bank competition on costs and services in Italy is now allowing a certain amount of "overemployment" in the sector. In these conditions the labour-saving potentialities of computerization (e.g. the possibility of centralisation of all contact with the customer by a cashier operating a terminal) might not be fully pursued. There are signs, however, of a decrease in the rate of expansion of bank employment more recently. (From an average of 9% per year at the beginning of the seventies to below 5% in 76/78).

It is estimated that Banks have autonomously produced some 70% of their soft-ware requirement, with a significant increase in the employment of technical staff.

d) Telecommunications

The manufacturing of communication apparatuses employs some 50,000 operatives in Italy, with 2/3 of the market consisting of public commutation systems. The gradual abandonment of mechanical components in commutation technologies will mean a loss of some 15,000 jobs, if compensative developments in other fields of production do not occur. The present situation in Italy is worsened by a serious financial crisis of ITALTEL, the major firm in the sector accounting for more than half of the total turnover, under the control of STET Public Holding. The present management of ITALTEL is planning a reduction in operative staff of 5000 units over three/four years, although they are not resorting for the moment to compulsory dismissals. It is hoped that the inevitable loss of jobs in manufacturing firms might be, at least partially, compensated by an increase in employment by SIP, the monopoly operator of telephone services in Italy, in connection with the diffusion of new distributed information systems.

e) Manufacturing

From the quoted research on "Robotics and Employment in the Engineering Sector", it appears that the automation of discontinuous processes, (numerical control, industrial robots), has interested the sectors of automobile production and home electrical appliances in particular. However, virtually all fields of industrial production, either operating on a continuous flow production, assembly-line systems or small-batch production are affected by progress in electronic applications. Even in the more traditional sectors like textiles and clothing we may find significant examples of the introduction of electronically controlled automatized machinery. Estimates in labour saving would require detailed case studies; the quoted research for example gives a range of a 7% to 25% reduction in the labour input requirement in car production, depending on the degree of effective implementation of the potentialities in the use of "robots". There is an acknowledgement, however, that the new processes have often meant an improvement in the overall working conditions, with the substitution of human manpower being concentrated in the most unpleasant and heavy jobs, (e.g. painting and welding in car assembly). This point is normally admitted by the Trade Union representatives themselves. The introduction of "robogate" system in the FIAT car assembly plants in Turin and Cassino for example is generally said to have given opportunities of "job-enlargement" for operatives previously confined to a repetitive task on the assembly-line, causing, however, additional strains, principally due to increases in work speeds for operatives employed upstream and downstream from the "robotized" section.

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I - INTRODUCTION (1)

Le 10 Mai 1981, François MITTERRAND a été élu Président de la République. Cette élection marque une profonde rupture dans l'évolution de la vie politique française. L'objectif de ce papier est de définir, six mois après le changement de gouvernement, quels sont les principaux axes de développement de la nouvelle politique gouvernementale en matière de prise en compte des conséquences sociales de l'informatisation.

La volonté de changement est clairement affirmée : "Nous vivons une grave crise économique et culturelle, les technologies existantes s'essoufflent, des progrès radicalement nouveaux émergent ... l'informatique pourra jouer un rôle considérable dans l'évolution de nos sociétés ... L'informatique, si elle est introduite intelligemment dans le contexte d'un projet global de société, sera capable de démultiplier les moyens de créer et de travailler de chacun." (Allocution du Président de la République lors de l'annonce de la création à Paris d'un Centre Mondial pour les Usages Sociaux de la Micro Electronique).

Il est trop tôt pour porter un jugement sur la politique gouvernementale dans ce domaine. De nombreuses réformes, bien que décidées, n'ont pas encore été mises en oeuvre. Des réformes, plus nombreuses encore, ne sont aujourd'hui encore qu'à l'état de projet. La phase actuelle est encore, malgré quelques premières initiatives, une phase de réflexion et de remise en cause (§ II).

Face à cet environnement nouveau, les partenaires sociaux semblent attendre les premières décisions gouvernementales pour réagir et, éventuellement, réorienter leur politique d'action (§ III).

Phase de réflexion : la phase actuelle est marquée par la tenue de nombreux colloques et la mise sur pied de nombreux programmes de recherches visant à éclairer la politique gouvernementale (§ IV).

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(1) Ce document a été réalisé au C.R.E.I. (Université de Paris XIII) par Nezih DINCBUDAK, Jean Paul JEANDON, Patrice MANCHION et Ugur MULDUR, sous la direction d'Olivier PASTRE.

Phase de réflexion, la phase actuelle est caractérisée par la poursuite des expériences sectorielles en cours, sans que de nouveaux projets à grande échelle soient véritablement lancés (§ V).

II - LES POLITIQUES GOUVERNEMENTALES : BEAUCOUP DE REFLEXION ET QUELQUES ACTIONS.

La déclaration du Président de la République n'est pas une déclaration de principe. Elle a été reprise par certains membres du Gouvernement qui se sont efforcés de la préciser :

. Jean Pierre CHEVENEMENT, Ministre de la Recherche et de la Technologie : il n'y aura *"pas de pause dans l'effort"* de développement de l'informatique. Mais *"une technologie pour se développer doit bénéficier d'un environnement social favorable"* et *"le développement de l'informatique ne peut pas se faire en dehors de la société et à plus forte raison contre elle"*.
(Allocution à la Convention Informatique).

. Pierre DREYFUS, Ministre de l'Industrie : *"L'emploi ne doit plus être perçu comme une conséquence mais comme un objectif en fonction duquel la politique d'informatisation de la production industrielle doit être orientée"* (Discours au Colloque de l'O.C.D.E. sur "l'Informatique, la Productivité et l'Emploi" - 19 Octobre 1981).

Pour juger de la nouvelle politique gouvernementale en matière d'informatisation, il faut intégrer celle-ci dans les grandes réformes structurelles qui sont actuellement mises en oeuvre en France. Trois réformes revêtent ici une importance toute particulière :

- Les Nationalisations. Deux chiffres seulement pour montrer l'importance de cette loi :

  . La part de la Recherche Industrielle sous contrôle public va doubler pour atteindre près de 75 % de l'effort total de recherche et de développement du pays.

  . Les nationalisations feront passer le parc public de 36 % à près de 52 % des matériels informatiques installés en France.

- La Décentralisation. Qu'il s'agisse de déconcentration industrielle ou de renforcement du pouvoir administratif des régions, l'informatique, facteur de décentralisation aussi bien que d'hyper concentration du pouvoir, est très directement concernée par cette réforme.

- L'Effort de Recherche. Un effort très important doit être consacré à cette activité (Objectif : 2,5 % du P.N.B. en 1985), considérée comme un élément essentiel de toute stratégie de sortie de crise.

Ceci posé, en ce qui concerne directement la dimension sociale de la politique d'informatisation, la position du gouvernement français peut être caractérisée aujourd'hui par un gros effort de réflexion (A), certaines actions de réorientations (B et C) et une importante décision (D).

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A - Un gros effort de réflexion

Concernant la dimension sociale de l'informatisation, trois initiatives méritent ici d'être soulignées.

1) La "Mission Filière Electronique" mise en place par le Ministère de la Recherche et de la Technologie. Cette mission créée le 19 Août 1981, et présidée par M. Abel FARNOUX, a reçu pour objectif d'établir un bilan de la recherche française en électronique, en fonction des finalités industrielles et commerciales à long terme (horizon 1990). Réunissant 15 permanents et mobilisant au total 70 personnes, la Mission a mis sur pieds deux commissions "sociales" (sur un total de 15 commissions) : une commission "Emploi-Formation" et une commission "Aspects socio-culturels". Deux journées de réflexion sont prévues en Décembre 1981 et le rapport final de la Mission doit être remis au mois de Mars 1982.

2) Le "Rapport sur les Droits des Travailleurs" réalisé par J. AUROUX, Ministre du Travail. Ce rapport qui a connu, en France, un grand retentissement, parle peu d'informatisation. Deux propositions faites dans ce rapport concernent néanmoins directement ce problème.

- la possibilité faite à tout comité d'entreprise de faire appel à un expert extérieur "sur les questions relatives à l'informatisation de l'entreprise".

- la fusion du Comité d'Hygiène et de Sécurité et du Comité d'Amélioration des Conditions de Travail. Ces deux comités, institués en principe dans toute entreprise de plus de 300 salariés, sont, à l'heure actuelle, très peu actifs. Leur fusion devrait permettre de leur donner un "second souffle".

Ces deux propositions font à l'heure actuelle, l'objet de projets de loi.

3) La relance de la discussion concernant l'activité du Fonds d'Amélioration des Conditions de Travail (Ministère du Travail) et la mise en oeuvre du Plan "Informatique et Conditions de Travail" (Ministère du Travail - Mission à l'Informatique). Dans un cas comme dans l'autre, les discussions actuelles visent à élargir le domaine d'application de ces deux programmes et à accélérer leur mise en oeuvre.

B - L'action :

I) Des projets mis en veilleuse

La première action du nouveau gouvernement a été de mettre en veilleuse un certain nombre de projets, et de réétudier les projets décidés au cours du septennat précédent afin de leur donner une orientation en accord avec les objectifs généraux du programme gouvernemental.

Le fondement de cette attitude s'explique par un souci d'agir en connaissance de cause, en prenant tout le temps de la concertation avec les partenaires sociaux.

La décision, prise au mois de juin, de geler le plan informatique dans les établissements scolaires et le développement du secteur d'E.A.O., s'est fondée sur la constatation d'un manque de concertation et de réflexion pédagogique sérieux sur l'usage de l'informatisation dans l'enseignement.

Une politique moins volontariste sera poursuivie, par ailleurs, en matière de Videotext grand public. Néanmoins, le Ministre des P.T.T., A. MEXANDEAU, a annoncé au cours de l'inauguration de l'expérience pilote de Vélizy, que le gouvernement souhaite davantage concentrer ses efforts sur le videotext professionnel.

Toujours en matière de Télécommunication, le nouveau Ministre des P.T.T. a critiqué la prise en considération des citoyens comme des clients par les services publics au cours du septennat précédent, et a mis l'accent sur la nécessité d'un important effort de réorganisation de la recherche en matière de circuits intégrés.

Les objectifs autour desquels le Plan Circuits Intégrés se doit d'être élaboré, sont définis par 1) la maîtrise de nouvelles technologies, et
2) par la reconquête du marché intérieur.

C - Action :

II) Les projets revitalisés

1) La politique industrielle

La politique définie par le Ministre de l'Industrie en matière de la production automatisée, repose sur les mêmes principes de base. En ce qui concerne la reconquête du marché intérieur, le premier objectif à atteindre est de réduire la pénétration étrangère de 60 % à 30 % dans le domaine des automatismes avancés.

Le deuxième objectif est d'atteindre un taux de croissance de 40 % par an, par un développement accéléré de la production nationale dans le secteur des automatismes avancés tels que Robot, MOCN, CAO, gestion automatisée de la production ainsi qu'en matière de logiciels.

L'effort financier en vue d'atteindre ces objectifs est évalué par le Ministère à 4 Milliards de FF dont la moitié environ (2,3 Md. FF) sera supportée par l'Etat.

Dans le cadre des mesures annoncées, l'A.D.E.P.A. (Association pour le Développement de la Production Automatisée) voit son rôle renforcé en matière d'assistance technique et de conseil auprès des utilisateurs, notamment P.M.I. L'A.D.E.P.A. recevra du Ministère de l'Industrie 75 MF de 1982 à 1984 pour remplir sa mission.

2) La Recherche

Une politique offensive de recherche, annoncée avant les élections par le Président de la République, se met en place progressivement, et la place de l'informatique dans ce programme voit son importance s'accroître.

Le Ministre de la Recherche et de la Technologie, J.P. CHEVENEMENT, a défini à la séance inaugurale de la Convention Informatique, les grandes lignes de l'action gouvernementale en matière de recherche et développement en informatique.

La stratégie gouvernementale sera fondée sur trois objectifs :

- renforcer les points forts : le logiciel et l'industrie de télécommunication en créant trois pôles télématiques autour de Matra, Thomson et C.G.E.
- assurer l'indépendance en matière de composants.
- assurer l'avenir de l'industrie informatique (CII-HB)

Le budget du Ministère de la Recherche et de la Technologie s'élèvera en 1985 à 2,5 % du P.I.B., contre 1,9 % en 1980.

Le budget civil de la recherche prévoit une augmentation de 29,6 % par rapport à 1980, tandis que les crédits affectés à l'informatique croissent de 60 %.

LE BUDGET CIVIL DE LA RECHERCHE EN 1982.

en MF	AP(1)	Augmentation 1981	CP(1)	Augmentation 1981	DO(1)	Augmentation 1981	AP + DO	Augmentation 1981
ADI	247	+ 30 %	118	+ 10 %	35	+ 40 %	282	+ 31 %
INRIA	65	+ 56 %	44	+ 20 %	92	+ 27 %	157	+ 38 %
Total ADI + INRIA	312	+ 34 %	162	+ 13 %	127	+ 31 %	439	+ 33 %
Plan d'informatisation	640	+ 80 %	463	+ 70 %	18	+ 38 %	658	+ 79 %
TOTAL INFORMATIQUE (2)	952	+ 62 %	625	+ 50 %	245	+ 122 %	1 097	+ 60 %
Total budget civil de la recherche	12 700	+ 36 %	10 700	+ 24 %	12 700	+ 18,6 %	25 400	+ 29,6 %

(1) AP : Autorisations de Programme
CP : Crédits de Paiement
DO : Dépenses Ordinaires
(2) A ce chiffre s'ajoutent les budgets affectés à la recherche en Informatique par le Ministère de l'Education Nationale, soit 120 MF en 82.

En totalisant l'ensemble des sommes allouées, on constate que 2 Milliards de FF seront affectés en 1982 à la recherche informatique.

En matière d'informatisation, les méthodes et moyens d'action utilisés seront largement basés sur la concertation sociale. Le Ministre a mis l'accent sur le fait que l'attitude scientifique doit désormais intégrer la dimension sociale à la technologie.

Une politique de la recherche ne sera réellement précisée qu'après la tenue, en janvier prochain, du Colloque National sur la Recherche et la Technologie.

3) La Formation

Bilan : Trois ans après la relance du débat "Informatique et Formation" :

a/ Formation initiale

- L'opération de "10 000 micro-ordinateurs" dans les lycées qui fut lancée fin 1978, sous la responsabilité du Ministère de l'Education, est loin d'atteindre les objectifs fixés.

A l'heure actuelle, le nombre de micro-ordinateurs installés dans les lycées ne dépasse pas 416. Et à cause du manque d'enseignants compétents, l'utilisation de ces 416 micro-ordinateurs dans les lycées est loin d'être "un facteur d'innovation" dans toutes les disciplines comme celà avait été prévu.

Le nouveau gouvernement, qui avait d'ailleurs arrêté cette opération au début de l'été, après avoir consulté les partenaires sociaux concernés, vient de décider la poursuite de l'opération, mais avec moins de précipitation.

La commande de 1 250 micro-ordinateurs et de 300 imprimantes vient d'être approuvée par le Ministre de l'Education, A. SAVARY. Il est évident que l'installation de ces micro-ordinateurs ne sera pas réalisée avant la fin de 1982.

Cependant, c'est la formation des enseignants qui réclame à court terme un effort considérable. L'objectif était de former 5 000 enseignants. Or, on a décidé qu'environ 200 enseignants vont être répartis dans dix centres spécialisés afin d'y recevoir une formation d'un an.

On prévoit ainsi que sans un développement accéléré, l'opération ne pourra se réaliser avant 1985.

- Des réformes ont été entreprises pour moderniser et réactualiser le Bac H et les B.T.S. afin de les adapter à l'évolution technologique. Le Ministre de l'Industrie, P. DREYFUS a annoncé la création d'un B.T.S. en informatique industrielle et la décision d'attribuer 1,2 Md F sur 3 ans, pour l'équipement des établissements d'enseignement.

- Le cas des I.U.T. est le plus préoccupant : presque rien n'est fait dans ces filières de formation.

b/ Formation professionnelle

- L'opération "1000 informaticiens", visant à former des analystes-programmeurs, avait été conçue comme une première mesure d'urgence, un palliatif à court terme.
On constate aujourd'hui que le bilan de cette opération est négatif. Au lieu de 1000 personnes prévues, 300 personnes ont été réellement sélectionnées par les S.S.C.I. et un nombre très réduit de ces 300 personnes ont été formées à ce jour. L'échec ne peut s'expliquer simplement par la lourdeur du mécanisme de sélection qui ne laisse pas assez de liberté aux S.S.C.I. Les S.S.C.I. ont continué pourtant d'embaucher des jeunes, mais par d'autres circuits

- Placée sous la tutelle du Ministère du Travail, l'Association pour la Formation Professionnelle des Adultes, principal organisme public de la Formation Permanente, a pour mission d'accueillir des salariés à titre individuel, mais peut également intervenir dans diverses formations à la demande des entreprises. A partir du Ier Décembre 1981, l'A.F.P.A. met en place dans

son centre de Neuilly-sur-Marne, une nouvelle formation de gestionnaire de petit système informatique. L'évolution technologique favorise le développement de solutions informatiques internes dans les P.M.E. sans toutefois que soient assurées de façon toujours satisfaisante, l'exploitation et la maintenance de premier niveau, ainsi que la relation avec les utilisateurs, fournisseurs de matériel et réalisateurs d'applications. C'est dans ce contexte, que l'A.F.P.A. propose ce nouveau cours avec un double objectif :

1) former pour les P.M.E./P.M.I. "des informaticiens capables de mettre en oeuvre des systèmes informatiques ou bureautiques,

2) et pour les constructeurs et S.S.C.I. "des professionnels aptes à assurer les relations commerciales et techniques avec les P.M.E.".

Dès juin 1982, cette formation pourra être étendue aux 22 "régions-programmes" de l'A.F.P.A.

L'A.F.P.A. forme, par ailleurs aujourd'hui, dans 7 centres répartis sur toute la France, 480 personnes par an au métier d'analyste-programmeur en télétraitement et conversationnel. L'année 1982 verra l'ouverture de trois centres nouveaux (Evry, Caen, Metz) d'une capacité totale de 120 stagiaires.

Le D.G.I. (Département Gestion et Informatique) exerce également une activité de recherche appliquée. En particulier, à la suite d'un contrat signé avec l'A.D.I., il collabore avec la Steria au projet Steve d'enseignement assisté par ordinateur utilisant des outils audio-visuels.

Le manque de 10 000 spécialistes constaté au début de l'année 1980 par TEBEKA, a eu ainsi tendance à lentement diminuer. Cela n'est pas dû toutefois aux seules actions de l'appareil public de formation, mais d'une part à une baisse conjoncturelle du besoin d'informaticiens des entreprises et d'autre part, à toutes sortes de palliatifs à court terme et à l'émergence

de nombreux établissements d'enseignement privés (1).

Face à l'immense problème que constitue la formation des hommes, le nouveau gouvernement, actuellement dans une phase de redéfinition de la politique de formation à l'informatique, a marqué sa volonté de donner une priorité à cet aspect du problème. Le fait que les crédits du Ministère de la Formation Professionnelle soient, en 1982, en augmentation de 27,5 % par rapport à l'année antérieure, constitue un dernier témoignage de cette volonté.

D - L'action

III) Le Centre Mondial pour les Usages Sociaux de la Micro-informatique

Le 20 Novembre 1981, le Président de la République a annoncé la création officielle à Paris d'un Centre Mondial pour les Usages Sociaux de la Micro-informatique. C'est Jean-Jacques SERVAN-SCHREIBER, auteur du "Défi Mondial" qui est à l'origine de la création de cet organisme. François défini un triple objectif pour ce Centre :

- Servir de carrefour des idées et des connaissances du monde entier en matière de micro-informatique.
- Mettre au point des logiciels et des langages plus évolués, permettant la fabrication d'un ordinateur individuel de grande diffusion.
- Multiplier avec les organismes existants, les expérimentations techniques et sociales en France et à l'étranger.

(1) Notons, à ce sujet, que l'insuffisance de l'appareil public laisse une large place à la formation privée. La qualité de la formation dans les organismes privés n'est toutefois soumise à aucun contrôle.

Doté de 100 MF de crédit et devant faire travailler conjointement d'éminents chercheurs du monde entier, ce Centre devrait être opérationnel dès Janvier 1982 (1). Le Ministère de la Recherche et de la Technologie s'est vu confier la charge de la réalisation de ce projet.

Le projet a suscité un certain nombre de réactions négatives en France. Les spécialistes français en informatique ont ainsi regretté d'avoir été tenus à l'écart des premières discussions, celles-ci ayant donné une place de choix aux experts étrangers.

D'autre part, certains redoutent que le marché créé par les activités du centre ne profite davantage aux industries américaines ou extrême orientales qu'aux entreprises françaises.

Enfin, les chercheurs français s'étonnent de l'importance de l'enveloppe de crédits octroyés à un seul centre de recherche.

Des pourparlers sont en cours pour tenter de résoudre les problèmes essentiels. On s'achemine vers la solution d'un centre "sans murs", essentiellement axé sur la coopération des meilleurs spécialistes français dans ce domaine, auxquels seraient associés quelques chercheurs étrangers de haut rang. Le travail se ferait dans les laboratoires français et étrangers qui accepteraient de participer à cette tâche coopérative, sous l'égide d'un conseil d'administration que pourrait présider Jean-Jacques SERVAN-SCHREIBER, ses membres ainsi que le conseil scientifique et la direction restant français en majorité.

Ce centre mondial serait par ailleurs un lieu inter-disciplinaire, où travailleraient ensemble informaticiens, électroniciens - mais aussi pédagogues, sociologues, chercheurs fondamentaux et industriels.

Dans les jours qui viennent, les informaticiens français qui participent à

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(1) Parmi les personnalités étrangères participant au projet, il convient de citer S. PAPERT, A.C. KAY, N. NEGROPONTE et le Professeur Zhisong Tang de Pékin.

ces discussions devraient proposer un projet dans ce sens et formuler des propositions qui pourraient servir de base à un pré-programme de travail et à une structure plus précise du futur centre. Il restera à définir le rôle que pourraient y jouer les chercheurs étrangers, et à préciser la participation des grands organismes de recherche, comme le CNRS, ou l'INRIA, l'Institut de Recherche en Informatique, à ce projet.

III - LES PARTENAIRES SOCIAUX

Face au changement de gouvernement, les partenaires sociaux semblent attendre, pour réagir, que soient plus clairement définis les principaux axes de la nouvelle politique d'informatisation.

Trois faits sont seuls ici à noter.

A - L'activité de la Commission Nationale de l'Informatique et des libertés. Cette Commission a pour mission de veiller à ce que l'informatisation de la société française ne se fasse pas au détriment des libertés individuelles. La C.N.I.L. vient de prendre des positions défavorables sur plusieurs projets. Elle a en particulier, refusé la mise en place au niveau national, du projet Gamin de sélection médicale des jeunes enfants et demandé la disparition de ce fichier dans les départements où il est mis en oeuvre. Elle a, par ailleurs, limité le contenu du fichier du Service National. Enfin, elle s'est opposée à la création d'un numéro national d'identité informatisé (1).

(1) A noter par ailleurs, que la C.N.I.L. est à l'heure actuelle en conflit avec Interpol. La C.N.I.L. considère, en effet, dans l'avis rendu à la demande du Ministère des Relations Extérieures, qu'Interpol est soumise à la loi "informatique et libertés", comme toute organisation exerçant son activité sur le territoire français. Ses fichiers devront donc être accessibles aux magistrats de la C.N.I.L.

B - Sur le front syndical ouvrier, rien à signaler. Les syndicats sont, à l'heure actuelle, trop préoccupés par les négociations concernant certains aspects fondamentaux de la vie sociale (règlementation de la durée du travail et renforcement du droit des travailleurs) pour faire de nouvelles propositions en matière d'informatisation. A noter toutefois :

- La "Vie Ouvrière", hebdomadaire de la C.G.T., a décidé de participer à l'expérience de videotex "Télétel" à Vélizy. 60 pages seront ainsi composées par cet hebdomadaire, concernant les demandes d'emploi dans la région, les salaires en vigueur dans les différentes professions ...

- Les syndicats C.G.T. et C.F.D.T. s'apprêtent à remettre aux Pouvoirs Publics leurs propositions respectives quant à l'avenir du secteur des Sociétés de Service et de Conseil en Informatique (S.S.C.I.).

Le document que la C.G.T. remettra dans les jours qui viennent au Ministère de l'Industrie souligne qu'au travers des nationalisations en cours, les 2/3 de la profession vont passer sous le contrôle des entreprises nationalisées ou des administrations.

Cette constatation, précise le document en question, *"permet d'envisager différemment le rôle qui devra être assigné à ces entreprises"*. Parmi les activités des S.S.C.I. qu'il faudrait freiner, en vue de les supprimer à terme, la C.G.T. met l'accent sur la location de personnel, rejoignant en ce point les thèses défendues par la C.F.D.T.

En ce qui concerne les banques de données, la C.G.T. estime qu'il est logique que des informations de caractère public soient offertes par les S.S.C.I. *"dans le cadre d'un service public"* aux associations ou aux groupes d'individus.

Dernier point à retenir des propositions de la C.G.T., la constitution d'un organisme professionnel tripartite chargé d'étudier l'évolution de la profession en fonction des possibilités nouvelles offertes par les changements technologiques.

De son côté, la C.F.D.T. a remis un premier document au Ministère du Travail dans lequel elle attire l'attention des pouvoirs publics sur les conditions de travail en régie (location de personnel), qu'elle qualifie *"d'informatisation sauvage"*. Un second document en préparation devrait se pencher, quant à lui, sur les activités mêmes des sociétés de service.

Source : Le Monde Informatique du 7/12/81.

C - Du côté des syndicats patronaux, peu de réactions sont à enregistrer.

Le seul fait marquant est le départ de M. François CEYRAC de la Présidence du C.N.P.F. (Centre National du Patronat Français) et son remplacement par Yvon GATTAZ. Certains observateurs voient là le signe d'une certaine "ouverture" de la part du principal syndicat patronal français.

IV - ETUDES ET RECHERCHES

Les problèmes de sensibilisation et d'information paraissent essentiels au nouveau gouvernement, pour assurer une mise en oeuvre "démocratique" de sa politique d'informatisation de la société.

Les enjeux dans ce domaine, sont d'importance :

- Préparer le terrain de la réflexion aux problèmes des années 90.
- Permettre au plus grand nombre d'agir en toute connaissance de cause.

Un important effort en la matière constitue donc un préalable fondamental à la définition d'une politique d'informatisation. Depuis le 10 Mai, les principaux faits à retenir en la matière se situent à trois niveaux :

- Les études
- Les publications
- Les colloques.

A - Les Etudes

Dans le domaine des études, un effort important semble s'engager sous l'égide de la Mission à l'Informatique (Ministère de l'Industrie), et ce dans deux directions.

1) Le développement des contrats de recherches. Parmi les contrats récemment signés, citons :

. Une étude portant sur l'organisme du logiciel, confiée à l'Institut de Recherche sur l'Amélioration des Conditions de Travail de Toulouse.

. Une étude consacrée à l'emploi féminin en collaboration avec le Ministère des Droits de la Femme, confiée au Centre de Recherches en Economie Industrielle (Université Paris XIII).

. Une étude relative à l'électronisation des flux monétaires, effectuée par le Centre de Recherches en Economie Industrielle en collaboration avec le Centre Supérieur des Affaires (C.E.S.A.).

. Une étude relative aux transformations de l'organisation du travail lié au développement de la bureautique.

2) Projet plus ambitieux, la Mission à l'Informatique participe avec l'Institut National de la Statistique, à l'édification d'un compte satellite de l'informatique rattaché au système de Comptabilité Nationale. Il s'agit là d'une expérience originale qu'il convient de souligner.

Parmi les autres organismes publics ayant récemment commandité des études, il convient de citer :

- L'Agence Nationale pour l'Amélioration des Conditions du Travail a assumé la mise en place d'une politique d'études de cas relative à l'informatisation.

- L'Association Française de Normalisation mène une réflexion sur les possibilités d'internationalisation des normes en matière de robotique.

- Le Commissariat Général au Plan pour sa part, est en train de mettre sur pied, en collaboration avec la Mission à l'Informatique, un nouveau programme à moyen terme sur le thème "Nouvelles Technologies et Emploi" (Source : Ministère de l'Industrie).

B - Les publications

Il faut noter tout d'abord, que M. Simon NORA, qui fut l'un des deux signataires du rapport sur l'Informatisation de la Société, commandé par M. Valéry GISCARD D'ESTAING, va désormais présider le Comité de Direction de la Collection "Informatisation et Sociétés" lancée en 1978 par la Mission à l'Informatique. Nous rappelons que cette collection entend favoriser le débat sur les conséquences économiques, sociales et culturelles de l'informatisation (Source : 01 Informatique, Electronique, Actualité).

La Mission à l'Informatique, en collaboration avec l'A.N.A.C.T. participe à la publication d'un "Guide Actif Méthodologique" à l'usage des entreprises utilisatrices d'informatique. Ce guide vise à faciliter l'introduction, dans les entreprises, des systèmes informatiques prenant en considération les facteurs sociaux (1)

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(1) Editions l'Organisation 1981.

Le Conseil Economique et Social a demandé à M. Y. LASFARGUE, Membre de l'Union Confédérale des Cadres du Syndicat C.F.D.T., une étude sur la robotique qui sera remise en Janvier 1982 et qui devrait faire l'objet d'une publication.

L'Association Française de Normalisation (A.F.N.O.R.) de son côté, a fait publier un ouvrage sur l'informatique et la sécurité.

C - Les colloques

- La Convention Informatique qui s'est tenue à la mi-septembre 1981 a été le cadre d'une vaste réflexion sur les aspects économiques et sociaux de l'informatisation.

- Le Colloque organisé par l'Organisation de Coopération et de Développement Economique ayant pour thème "Les Technologies de l'Information, la Productivité et l'Emploi" (1), dont les différentes interventions seront publiées.

- Diebold France a organisé de son côté deux journées de réflexion sur la robotique auxquelles de nombreux responsables gouvernementaux ont participé (2) (Source : 01 Informatique).

- L'Association Internationale pour l'Amélioration du Cadre du Travail et de son Environnement a tenu un colloque portant sur "Bureautique, Cadre et Conditions de Travail", présidé par B. LORIMY , Directeur de l'Agence de l'Informatique dont les thèmes principaux furent les terminaux multi-fonctions, la normalisation et le pouvoir de l'utilisateur.

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(1) Château de la Muette, 19-21 Octobre 1981, Paris. Groupe de Travail sur la politique de l'information, de l'informatique et des communications.

(2) 24 et 25 Novembre 1981. A cette occasion, M. François BARASTIN du Ministère de la Recherche et de la Technologie y a annoncé la constitution d'une Mission robotique en collaboration avec le Ministère de l'Industrie, l'Agence de l'Informatique, l'Association pour le Développement de la Production Automatisée et l'A.N.V.A.R.

V - LES EXPERIENCES SECTORIELLES

La période actuelle est à la réflexion. Elle n'est pas au démarrage de nouvelles expériences sectorielles. En attendant la définition des nouveaux "programmes d'actions prioritaires", en matière d'informatisation, le gouvernement se contente de poursuivre les expériences en cours.

Il convient de remarquer que la plupart de celles-ci concernent l'informatisation du secteur tertiaire.

Parmi les expériences dont la programmation est arrivée à la phase opérationnelle au cours des derniers mois, il convient de noter :

- L'ouverture à Paris d'un service de documentation pour les Avocats : le C.E.D.I.A.

- Un centre serveur d'informations télématiques destinées aux agriculteurs a été présenté le 28 Juillet 1981 à NANTES pour la D.G.T. Ce Centre télématique, dénommé AGRIPEL, permettra à 25 agriculteurs de Loire-Atlantique, d'obtenir sur leur écran de télévision, les informations relatives à l'agriculture, météorologie, gestion agricole, etc. Les banques de données seront plus tard créées à l'échelon régional ou local par des groupements professionnels, des associations ou sociétés privées.

- Premières mises en service de "Libre-Service Affranchissement" dans trois bureaux de postes parisiens. P.T.T. prévoit dans un premier temps d'équiper 200 bureaux les plus importants.

- La première expérience de vidéotex professionnel a eu lieu dans l'hôtellerie française.

- Au cours de l'année 1982, expérimentation de la carte à mémoire à BLOIS (CII-HB), LYON (Schlumberger) et CAEN (Philips).

- L'électronique Marcel DASSAULT vient de présenter en fonctionnement au SICOB 81, pour la première fois, un terminal d'autorisation qui permet aux commerçants de simplifier la procédure habituelle lors des paiements par cartes de crédit. Il sera expérimenté en 1982.

- L'ADI vient de créer une mission pour l'informatisation du secteur médico-social afin de renforcer son action dans ce domaine.

V/29/82 - EN
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THE INTRODUCTION OF INFORMATION TECHNOLOGY AND EMPLOYMENT SINCE 10 MAY 1981

I - INTRODUCTION (1)

The election of François MITTERRAND as President of the Republic on 10 May 1981 radically altered the course of political events in France. This paper seeks - six months after the new goverment took power - to define the main lines of the new Goverment's policy in respect of the social consequences of the introduction of information technology .

President MITTERRAND clearly endorsed a desire for change when he said in an address announcing the setting up in Paris of a Centre Mondial pour les Usages Sociaux de la Micro-informatique (World Centre for the Social Uses of Microprocessors) :

> "We are living through a serious economic and cultural crisis, existing technology is becoming obsolescent and radical new developments are taking place ... information technology could play a significant role in the evolution of our society ... if we adopt an intelligent approach to the introduction of information technology in the context of an overall plan for society it could expand every individual's capacity to work and to create".

It is too early to judge government policy in this area, for although many reforms have been decided on, they have not yet been implemented, while many more are still on the drawing board. Although a few initial steps have been taken, the subject is still under discussion and investigation (II).

Faced with this new development, the two sides of industry seem to be awaiting the first government decisions before reacting and, if needs be, recasting their own policies (III).

In the present phase, many symposia have been organized and many research programmes launched to clarify Government policy (IV).

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(1) This paper was prepared at the Centre de Recherches en Economie Industrielle (CREI), University of Paris XIII by Nezih Dincbudak, Jean-Paul Jeandon, Patrice Manchion and Ugur Muldur under the guidance of Olivier Pastré.

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This is chiefly a period of reflection; although a few sectoral experiments are taking place, no new large-scale projects have been launched (V).

II - GOVERNMENT POLICIES :

MUCH THOUGHT AND SOME ACTION.

The statement by the President of the Republic is not a declaration of principle. It was taken up by various members of the Government who sought to give it substance :

- Jean Pierre Chevenement, Minister for Research and Technology said there would be "no slackening in the effort" to develop information technology, but "it needed a favourable social climate to develop... Information technology could not be developed apart from society and still less in opposition to it".

  (Address to the Convention Informatique (Information Conference).

- Pierre Dreyfus, Minister for Industry said : "employment should not be seen as a consequence but as an aim governing the choice of policy regarding the application of information technology to industrial production".

  (Address to the OECD Symposium on Information technology, Productivity and Employment - 19 October 1981).

If the new government's information technology is to be judged, it must be seen in the context of the major structural reforms at present being implemented in France. Three of these reforms are of particular significance.

- Nationalization. Two figures alone give some idea of the impact of this law :
  - the percentage of industrial research under public control will double, amounting to nearly 75 % of France's total research and development endeavours ;
  - nationalization will increase from 36 % to 52 % the percentage of state-owned computer equipment in France.

- Decentralization. Whether industrial decentralization or the strengthening of the administrative powers of the regions is at stake, information technology - which can be used to decentralize power as well as to concentrate it - is very heavily affected by this reform.

- Research. Substantial funds are to be devoted to this activity (the aim is 2.5 % of GNP in 1985), which is regarded as a vital factor in any strategy aimed at overcoming the crisis.

Ref above , there are three main facets to the French Government's position on the actual social aspects of IT policy today : a major effort is being devoted to consideration of the problem (A), certain projects have been rethought (B), and (C), a major decision has been taken (D).

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A. Consideration of the problem

With respect to the social aspects of information technology, three measures are worth mentioning.

-1) The "Mission Filière Electronique" (electronics mission), set up by the Ministry of Research and Technology on 19 August 1981 and headed by Mr Abel Farnoux, has been given the task of reviewing French research in electronics for long-term industrial and commercial purposes (horizon 1990). It has a staff of 15 permanent members and call on a total of 70 people. The Mission has set up two "social" committees (out of a total of 15 committees), an employment training committee and a committee on socio-cultural aspects. It is planned to hold a two-day discussion in December 1981 with a final report by the Mission to be submitted in March 1982.

-2) The "Rapport sur les Droits des Travailleurs" (report on workers'rights) which was drawn up by J. Auroux of the Minister of Employment and which caused a considerable stir in France, makes little reference to the introduction of information technology. Nevertheless, two proposals contained in the report are directly related to the question :

- that every works council be able to call on an outside expert for advice on matters concerning the introduction of information technology in a firm ;
- that the Health and Safety Committee and the Committee on the Improvement of Working Conditions be merged. These two committees are in principle set up in any firm employing over 300 workers, but are largerly inactive at the present time. A merger should give them a new lease of life.

Both these proposals are at present being incorporated in draft laws.

-3) Discussions have been reopened concerning the Fonds d'Amélioration des Conditions de Travail under the Ministry of Labour and implementation of the "Informatique et Conditions de Travail" (information technology and working conditions) programme under the Ministry of Labour - Mission à l'Informatique (information technology office). The aim of these discussions is to expand the area of application of both programmes and speed up their implementation.

B. Action

I. Projects in abeyance

One of the new Government's first steps was to reduce activity on a number of projects to a minimum and re-examine the projects approved during the preceeding Presidential term, so as to align them with the general aims of its programme.

This attitude is founded on the desire to act in full knowledge of the facts and to allow sufficient time for concertation with management and labour.

The decision taken in June to halt the programme to introduce computers in schools and to develop computer assisted instruction (CAI) was motivated by the realisation that there had been little concertation and insufficient consideration of the educational implications.

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A less active policy will be followed as regards the introduction of Videotext for the use of the general public. At the inauguration of the Vélizy pilot project, Mr. A. Mexandeau, the new Minister of Communication announced that the Government hoped to concentrate more on the use of Videotext in business.

In another reference to the realm of telecommunications, the new Minister criticized the public services for regarding citizens as customers during the previous Presidential term and stressed the need for a radical reorganization of research into integrated circuits.

The aim around which the integrated circuits plan should be built are :

- 1. mastery of the new technology
- 2. reconquest of the domestic market.

C. Action

II. Reactivated projects

1. Industrial policy

The policy laid down by the Minister of Industry as regards automated production is governed by the same basic principles. As regards reconquest of the domestic market, the first aim is to reduce the foreign share from 60 % to 30 % in the area of advanced automation.

The second objective is to achieve an annual growth rate of 40 % by accelerated development of national production in the advanced automated sector such as Robot., NC machine tools, automated production management and software.

The Ministry estimates that a budget of FF 4 000 million, of which some FF 2.3 thousand million is to be provided by the State, will be needed to achieve these aims.

Under the measures which have been announced, the ADEPA (Association pour le Développement de la Production Automatisée - association for the development of automated production) - will play a more important role as regards technical assistance and advice to users, particularly small and medium-sized industries. In 1982-84, the ADEPA will receive FF 75 million to amount its assignment.

2. Research

The dynamic research policy, promised before the elections by the President of Republic is gradually emerging and information technology is assuming growing within it.

At the inaugural meeting of the information conference, J.P. CHEVENEMENT, the Minister of Research and Technology announced the main lines of Government action as regards information technology research and development.

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Government strategy is based on three goals :

- to reinforce the strong points : software and the telecommunications industry by setting up three telematics centres based on Matra, Thomson and CGE;
- to achieve independence in the field of component parts ;
- to ensure the future of the telematics industry (CII-HB).

The Ministry of Research and Technology budget in 1985 will amount to 2.5 % of GNP as against 1.8 % in 1980.

The non-military research budget will be raised by 29.6 % compared with 1980, while appropriations for information technology will rise by 60 %.

The non-military research budget in 1982

in million FF	PA (1)	Increase over 1981	AP (1)	Increase over 1981	OE (1)	Increase over 1981	PA + OE	Increase over 1981
ADI	247	+ 30 %	118	+ 10 %	35	+ 40 %	282	+ 31 %
INRIA	65	+ 56 %	44	+ 20 %	92	+ 27 %	157	+ 38 %
Total ADI + INRIA	312	+ 34 %	162	+ 13 %	127	+ 31 %	439	+ 33 %
Computerization plan	640	+ 80 %	463	+ 70 %	18	+ 38 %	658	+ 79 %
Total informatics (2)	952	+ 62 %	625	+ 50 %	245	+ 122 %	1 097	+ 60 %
Total non-military research budget	12 700	+ 36 %	10 700	+ 24 %	12 700	+ 18,6 %	25 400	+ 29,6 %

(1) PA - Programme authorizations
AP - Appropriations for payment
OE - Ordinary expenditure

(2) To this figure should be added the appropriations for informatics research allocated by the Ministry of Education, namely FF 120 million in 1982.

Altogether, FF 2 000 million will be allocated to informatics research in 1982.

With respect to the introduction of information technology, the methods and means of action unsed will largely depend on the results of social concertation. The Minister has stressed that in future scientists must take account of the social implications of technology.

A research policy will not be fully defined until after the National Symposium on Research and Technology to be held in January.

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3. Training

Survey : three years after the re-opening of the discussion on information technology and training.

a/ Initial training

The campaign to install 10 000 microcomputers in lycées (upper secondary schools), launched at the end of 1978 under the responsibility of the Ministry of Education, is still from having achieved the goals set for it.

At the present time, no more than 416 microcomputers have been installed in upper secondary schools. Because of the shortage of competent instructors, the use of these 416 microcomputers is far from achieving the hoped-for innovative breakthrough in all disciplines.

The new Government, which halted this campaign early in the summer, after consulting those concerned, has since decided to go ahead with it, though with less haste.

A. Savary, the Minister of Education, has just approved an order for 1 250 microcomputers, and 300 printers, but these microcomputers will obviously not be installed before the end of 1982.

In the short term, however, it is teacher training which demands considerable effort. The aim was to train 5 000 teachers, but it has been decided to send some 200 teachers to ten specialized centres for one-year training courses.

Thus, unless things are speeded up, the campaign cannot be completed before 1985.

Reforms have been introduced to modernize and update the Baccalaureat H stream - which includes computer sciences - and the BTS (Brevet de Technicien supérieur - advanced technical studies certificate -) to adapt them to technological change. P. Dreyfus, the Minister of Industry, has announced the creation of a BTS in industrial information technology and has decided to allocate FF I 200 million over three years for the equipment of teaching establishments.

The Instituts universitaires de Technologie (IUT) are causing the greatest concern, for almost nothing is being done as regards this type of training.

b/ Vocational training

The "1000 computer experts" campaign to train programme analysts was designed as an initial emergency measure - a short-term palliative.

The results of this campaign are negative. Instead of the planned 1 000 trainees, in practice 300 people were selected by the SSCI and very few of those 300 have completed their training to date. This failure cannot be attributed entirely to a cumbersome selection mechanism which does not allow the SSCI sufficient freedom. The SSCI (Sociétés de Service et Conseil en informatique - data application consultant) have continued to recruit young people, but through other channels.

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The Association pour la Formation Professionnelle des Adultes (AFPA) - Association for adult vocational training - under the aegis of the Ministry of Labour, is the main public body responsible for vocational training. Its task is to provide training for employees on an individual basis, but it can also take part in various types of training at the request of firms. On 1 December 1981, the AFPA set up a new training course in the management of small data systems at its Neuilly-sur-Marne centre. Technological advances encourage the use of computer systems in small and medium-sized undertakings, although first-class utilization and maintenance of such systems or relations between users, hardware manufacturers and applications designers are not always guaranteed. In this context the AFPA is offering a new course with two aims :

1) to train operators capable of using data systems or automated office equipment to work in small and medium-sized undertakings and industries ;

2) to train operators capable of establishing commercial and technical links with small and medium-sized undertakings to work for manufacturers and the SSCI.

The training course can be extended to the 22 regional programmes of the AFPA as from June 1982.

Today, the AFPA is training 480 people per year in seven centres scattered throughout France as programme analysts in teleprocessing and the conversational mode. Three more centres with a total capacity of 120 trainees will be opened at Evry, Caen and Metz in 1982.

The DGI (Departement Gestion et Informatique - Management and information technology - department) is also engaged in applied research. In particular, having concluded a contract with the Agence de l'Informatique (ADI), it is cooperating with STERIA in the Steve computer Assisted Education Project using audio visual aids.

The shortfall of 10 000 data specialists noted at the beginning of 1980 by TEBEKA is thus being slowly wittled away. However, this is not solely due to public training programmes but also to a cyclical decline in the demand for computer operators by firms, a variety of short-term palliatives and the appearance on the scene of numerous private training establishments (1).

Faced with the immense problem of training people and the need to redefine an information technology, the new Government has shown that it wishes to give priority to this aspect of the problem. The fact that the appropriations for the Ministry of Vocational Training were raised by 27.5 % for 1982 compared with last year is evidence of this attitude.

D. Action

III. World Centre for the Social Uses of Microprocessors

On 20 November 1981, the President of the Republic officially announced the setting up in Paris of a World Centre for the Social Uses of Microprocessors. The idea originated with Jean-Jacques SERVAN-SCHREIBER, author of "Défi Mondial". François MITTERRAND announced a triple objective for the Centre :

(1) In this connection, the inadequacy of public facilities leaves the field wide open for private training. Training standards in private establishments are not subject to any control.

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- to provide a forum for the exchange of ideas and knowledge in the field of microprocessors throughout the world ;
- to develop the most advanced software and languages so that individual computers could be developed for mass distribution ;
- to increase technical and social experiments by existing bodies in France and abroad.

Eminent research scientists from all over the world will work at the Centre which should become operational in January 1982 (1) and to which FF 100 million have been allocated. The Ministry of Research and Technology is responsible for implementing the project.

There were some negative reactions to this project in France. French information technology experts, for example, deplored the fact that they had not been invited to the initial discussions, which were dominated by foreign experts.

Other expressed fears that the market built up as a result of the Centre's activities might be of greater benefit to American or Far Eastern manufacturers than to their French counterparts.

Lastly, French research workers are surprised at the size of the appropriations granted to a single research centre.

Talks under way in an endeavour to resolve the main problems seem to be headed towards a solution in the form of a structure based essentially on cooperation between the leading French experts in this field in association with a number of top-level foreign researchers. The work would be carried out in those laboratories in France and abroad willing to participate in this cooperative task under the aegis of an administrative board which could be chaired by Jean-Jacques SERVAN-SCHREIBER, the majority of the members of that board, of the scientific council and of the management would be French.

This would be an interdisciplinary centre where information technology experts, electronics experts, sociologists, basic and industrial research scientists would work together.

In the near future, the French information technology experts participating in these discussions will put forward a proposal to this effect and draft proposals to serve as a basis for a preliminary work programme and a more specific structure for the future Centre. The role to be played by foreign research workers would still have to be defined, as would the degree of participation of major research institutes such as the CNRS or the INRIA, the Information Technology research Institute.

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(1) Among the distinguished foreigners participating in the project are S. PAPERT, A.C. KAY, N. NEGROPONTE and Prof. Zhisong Tang of Peking.

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III. THE TWO SIDES OF INDUSTRY

Faced with the change of Government, the two sides of industry appear to be waiting for a clearer picture of the main features of the new computerization policy before reacting.

Three points only should be noted here.

A - The work of the Commission Nationale de l'Informatique et des libertés (CNIL : National Commission on Information Technology and Liberties). The task of this commission is to ensure that the computerization of French society does not take place at the cost of individual liberties. The CNIL has recently come out against several projects. In particular it rejected the introduction at national level of the Gamin project on the medical selection of young children and demanded that his file be scrapped in those departments in which it has been introduced. It also restricted the content of the National Service file. Finally it opposed the creation of a computerized national identity number (1).

B - There is nothing to report as regards the trade unions. The unions are currently too preoccupied with negotiations on certain fundamental aspects of social life (rules on working hours and strengthening of workers' rights) to make new proposals on computerization. The following should, however, be noted :

- the "Vie Ouvrière" (Working Life), the CGT's weekly publication, has decided to take part in the "Télétel" videotext experiment at Vélizy. Accordingly, 60 pages will be composed by this weekly on job applications in the region, the wages in force in the various occupations ...
- the CGT and CFDT trade union organizations are preparing to submit their respective proposals to the public authorities regarding the future of the Sociétés de Service et de Conseil en Informatique sector

The document that the CGT will present to the Ministry of Industry in the near future stresses that the nationalization schemes in progress will bring two-thirds of the profession under the control of nationalized undertakings or the authorities.

The last point to be noted among the CGT proposals is the setting up of a tripartite professional body responsible for studying the development of the profession in the light of the new opportunities offered by technological changes.

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(1) It should also be noted that the CNIL is currently involved in a dispute with Interpol. In its opinion delivered at the request of the Ministry of External Relations, the CNIL maintains that Interpol is subject to the law on information technology and liberties in the same way as any organization operating on French terrotory. CNIL magistrates must therefore have access to its files.

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For its part, the CFDT has presented an initial document to the Ministry of Labour in which it draws the attention of the public authorities to conditions of employment in the public sector (renting of personnel from outside firms), which it describes as "uncontrolled computerization". A second document which is being drawn up should deal with the actual activities of service companies.

Source : "Le Monde Informatique" of 7 december 1981

C - There is little reaction from the employers' organizations to record.

The only event of note has been the replacement of Monsieur François CEYRAC by Yvon GATTAZ as President of the CNPF (Centre National du Patronat Français - French National Employers'Association). Some observers see this as a sign of a degree of "opening up" on the part of the main employers' organization in France.

IV. STUDIES AND RESEARCH

The new Government evidently regards the problems of informing the public and increasing its awareness of the situation as essential to a "democratic" implementation of its policy for the computerization of society.

What is at stake here is important :

- preparing the ground for studying the problem of the 1990s
- enabling as many as possible to be fully informed

A major effort in this field is therefore a fundamental prerequisite to the formulation of a computerization policy. Since 10 May, the main events to be recorded have been in three areas :

- studies;
- publications ;
- conferences.

A - Studies

As regards studies, a major effort is being undertaken under the aegis of the Mission à l'Informatique (Ministry for Industrial Affairs), in two areas :

1). a study concerning the structure of software, commissioned from the Institut de Recherche sur l'Amélioration des Conditions de Travail (Institute for Research into the Improvement of Working Conditions) in Toulouse.

. a study devoted to the employment of women in collaboration with the Ministry for Women's Rights, commissioned from the Centre de Recherches en Economie Industrielle (CREI - Centre for Research in Industrial Economics) (University of Paris XIII).

. a study on the computerization of currency flows, carried out by the CREI in collaboration with the Centre d'Enseignement Supérieur des Affaires (CESA - Centre for Advanced Business Studies)

. a study on the changes in work organization connected with the development of office electronics.

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2) In a more ambitious project, the Mission à l'Informatique is taking part with the Institut National de la Statistique (INSEE - National Statistics Institue) in drawing up a subsidiary account for information technology connected to the National Accounts system (SECN). This is an original experiment to which attention should be drawn.

Among other public bodies which have recently commissioned studies, the following should be noted :

- L'Agence Nationale pour l'Amélioration des Conditions du Travail (ANACT, National Agency for the Improvement of Working Conditions) has introduced a policy of case studies relating to computerization.
- L'Association Française de Normalisation (AFNOR - French Standardization Association) is studying the possibilities of internationalizing standards in relation to robotics.
- The Commissariat Général au Plan (Central Planning Office) is in the process of setting up, in collaboration with the Mission à l'Informatique a new medium-term programme on the theme "New Technologies and Employment" (Source : Ministry of Industry).

B - Publications

It should be noted first of all that Simon NORA, who is one of the two authors of the report on the Computerization of Society commissioned by President Valéry Giscard d'Estaing is now to head the Managing Board of the "Informatisation et Sociétés" (Computerization and Society) series launched in 1978 by the Mission à l'Informatique. It should be recalled that the aim of this series is to stimulate debate on the economic, social and cultural consequences of computerization (Source : 01 Informatique, Electronique, Actualité).

The Mission à l'Informatique, in collaboration with ANACT, is participating in the publication of a "Guide Actif Méthodologique" (Active Methodological Guide) for the use of firms operating data processing systems. The aim of this guide is to facilitate the introduction in firms of data-processing systems which takes social factors into account (1).

The Social and Economic Council has asked Yves LASFARGUE, Member of the Union Confédérale des Cadres de la CFDT (UCC-CFDT Confederated Union of Managerial Staff of the CFDT) to carry out a study on robotics which will be submitted in January 1982 and should be published.

The Association Française de Normalisation (AFNOR) has published a work on information technology and security.

C - Conferences

- The Information Technology Convention held in mid-September 1981 was the forum for a wide-ranging examination of the economic and social aspects of computerization.

- The conference organized by the Organization for Economic Cooperation and Development (OECD) on "Information Technology, Productivity and Employment" (2); the various reports presented at the conference will be published.

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(1) Editions l'Organisation 1981

(2) Château de la Muette, 19-21 October 1981, Paris. Working Party on Information, Data Processing and Communications Policy.

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- Diebold France organized a two-day conference on robotics which was attended by many Government figures (1) (Source : 01 Informatique)

- The Association Internationale pour l'Amélioration du Cadre du Travail et de son Environnement (International Association for the Improvement of the Working Environment) held a conference on "Office Electronics, Working Environment and Working Conditions", chaired by B. LORIMY, Head of the Agence de l'Informatique, (Information Technology Agency), the principal themes of which were multi-function terminals, standardization and the power of the user.

V. SECTORAL EXPERIMENTS

The current period is one of study. No new sectoral experiments are being started. Pending the definition of new "priority action programmes" on computerization, the Government is simply pursuing the current experiments.

It should be pointed out that most of these are concerned with information technology in the services sector.

The following experiments which have reached the operational stage in the last few months should be noted :

- the opening in Paris of the documentation service for lawyers : the CEDIA;
- a centre distributing telematic information for farmers was presented on 28 July 1981 in Nantes for the DGT. This Telematics Centre, called AGRIPEL, will allow 25 farmers in the Loire-Atlantique area to receive on their TV screens information on agriculture, meteorology, farm management, etc. Data banks will be set up later at regional or local level by professional groups, associations or private companies.
- introduction of "self-service franking" in three post offices in Paris. The P & T (Post Office) plans to equip the 200 largest post offices first of all.
- the first experiment with professional videotext was carried out by the French hotel trade.
- during 1982, there will be experiments with computerized credit cards at Blois (CII-HB), Lyon (Schlumberger) and Caen (Philips)
- Marcel Dassault electronics has just shown in operation for the first time at SICOB 81 a clearance terminal which allows traders to simplify the normal procedure for payment by credit card. It will be tried out in 1982.
- The ADI has just set up a unit for computerization in the medico-social sector in order to further its work in that area.

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(1) 24 and 25 November 1981. On this occasion Mr. François BARASTIN of the Ministry for Research and Technology announced the setting up of a Mission robotique (robotics unit) in collaboration with the Ministry of Industry, the Agence de l'Informatique, the Association pour le Développement de la Production Automatisée (Association for the Development of Computerized Production) and ANVAR.

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New (Information) Technology and Social Change in the United Kingdom

Kurt Hoffman and Ian Miles

1. Introduction

This report covers the period October 1981 to December 1981, though there is necessarily some retrospective summary of longer term processes in which current events are embedded. It is based largely on meetings attended and readings of the specialist press and research literatures. There is little attempt to arbitrate on competing claims when these are encountered.

The ambiguities of the new technology can be illustrated by placing a few pieces of data side-by-side. On the one hand sales of personal computers are booming, and a high street chain store has had to revise its orders upwards; on the other, 80% of the British public have never heard of information technology (IT). In a parliamentary debate on the new technology only 4 MPs spoke, while Government aid to this area has been increasing in leaps and bounds; and yet the 'privatisation' of many informatics enterprises is preceeding apace.

These seemingly paradoxical happenings illustrate the complexity of the current British situation. Information is one element in a whirlwind of concerns - about industrial decline, imports, youth unemployment, inner city decay, the position of mi[illegible]cities, state expenditure limits, and so on. This rapidly changing background can only be hinted at here, but we must caution that it has inevitably led to some selection of topics and events as worth focussing on, both by the authors and by our informants.

2. Government Activities

1981 saw increasing government commitment to IT. Already the year witnessed the appointment of Kenneth Baker as Minister for Information Technology, and the allocation of funds to promoting viewdata, optoelectronics, and computers in schools. In October a further £6 million was promised to promote computer-aided design in the UK. And in November it was formally announced that 1982 was to be declared IT year, with £600 thousand allocated to activities here.

The second main thread of governmental activity has involved the uneven 'privatisation' of IT assets held by the state. Earlier in 1981 the British Technology Group (BTG) was formed from the National Enterprise Board and the National Research and Development Council. While this is involved in pointing risk capital (in exchange for equity) in microcomputing and software, it has also been selling off old Enterprise Board Assets. By the end of 1981 some £130 million of assets were divested (profits going to reduce the Public Sector Borrowing Requirement), marking the end of a threefold strategy of state enterprise around silicon chips, office automation and software systems. In October plans to sell Nexos' word processing facilities to Gastelner (however, another customer now seems likely), and its computer facilities back to Delphi (an Exxon subsidiary) were announced. In November Insac (a software company) was sold to a US company, Brieton Lee. BTG is selling stakes in various other companies, but has increased its holding in CAP (software).

In addition to these two general thrusts in government policy, a number of more specific initiatives - around training, informatisation of government offices, and the like - are underway, as we shall see below.

(i) promotion of R&D

We should first record the continuation of the Microelectronics Industry Support Programme (MISP) and the Microelectronics Awareness Programme (MAP) described in our previous report. These programmes have provided support for development of components and applications for IT. In December Minister Baker announced that of some £60 million pa to be devoted to IT, most would go on Applications and Product Development Schemes. £25 million was to be devoted to optoelectronics and £10 million to robotics.

The Science and Engineering Research Council has also become increasingly involved in promoting IT R&D, in particular though its Computing and Communications Subcommittee. Towards the end of the year this subcommittee announced an initiative around software, based on the premise that urgent industrial needs remain unmet by the current structures of training and research. The aim is to improve the technology at the base of academic software activities, to improve software engineering research, and to increase movement between academic and industrial sites. To this end greater links are being forged with the computer firm ICL (which is expected to become the home of more software research); and ICL's Perq scientific hardware is part of a standard system (with Pascal language and Unix operating systems) that the subcommittee will promote and seek to form networks from

(ii) labour law and working conditions

(iii)Safety and health

We have no new information under these headings, except to note that the press has begun to speculate about the possibility of specific restraints upon unions paralysing whole industries by withdrawal of only a few key operatives. Computer staff have been involved in such action in 1981.

(iv) Education Policy

Developments continue around the main areas discussed in our previous report. The subsidisation of one-half of the hardware costs for secondary schools to purchase approved microcomputers has succeeded, at least to the extend that some 2000 of an estimated 3000 schools without such equipment had been processed by the scheme by November 1981. It is now planned to extend the offer to primary schools, and to make subsidies available for the purchase of additional units.

This latter point will be welcomed by the Social Science Research Council, in whose annual report the idea that one computer per school was sufficient was derided. (The analogy was drawn with attempting to teach cookery to classrooms while the school possessed only one oven.) Another critic of the programme, Clive Sinclair, gained satisfaction in that his own ZX81 computer, not approved by the scheme, had nonetheless sold to over 2000 schools between May (when he announced his own half-price offer to schools) and September.

The Council for Educational Technology, concerned with increasing awareness of IT in general, announced in November an experimental teleeducation scheme based on British Telecommunication's Prestel service. 25 schools and colleges are to be given access to selected programmes (including computer assisted learning) in a pilot study.

The Bow Group of the Conservative Party published a pamphlet in November entitled Learning for Charge in which a longer term IT education strategy was agreed by Philip Virgo. Among the ideas presented are that smaller schools are made possible by new technologies with which they will be more capible of offering specialist subjects. Investment, then, should be more in technology and skills than in buildings,

and funds might be provided by local groups and firms who could use premises and equipment for out-of-hours training purposes. Increasingly, memorisation and simple logic will be downgraded and the school system should emphasize information-finding and group problem solving skills, creativity and social sensitivity.

The BBC is to begin its computer teaching course in January 1982, and efforts are now underway to ensure that all schools have the necessary equipment to hand. Broadcasts for the general public have been delayed by a month, however, because the demand for Acorn computers (to which the course is tailored) has been so high (about twice the setimated 5,000 per month) that not all customers can be supplied before then. (There have also been some production difficulties.)

(v) Training and Retraining

Concern over youth unemployment has led to youth training plans being completely revised, with the Government intending to introduce a new Youth Training Scheme (YTS) for unemployed school leavers.in place of the current Youth Opportunities Programme (YOP). Perhaps 50% of school leavers went onto YOP in 1981, mostly to 6 month schemes in small and medium-sized businesses. Criticism of YOP provisions has grown with accusations from unions and trainees that what was often involved was cheap labour and no training. YTS will cater for all leaving school at the age of 16 (some 600,000 in 1983, when it begins) and pay £15 per week (less than YOP wages) - nonparticipants will be ineligible for unemployment benefit. The scheme may be considerably modified in the face of doubts that sufficient places can be created, that serious training on any scale can be provided (despite the allocation of £1 billion, and that youth will accept what is regarded in many quarters as a system of 'conscript labour'.

Another controversial development around training is the removal of government support from a number of industrial training boards. These will become voluntary organisations, and training thus becomes more a matter for firms themselves. Several of the boards had been criticised for inefficiency and confused priorities. One of the boards to survive unscathed is the Engineering Industries Training Board. It arranged in December to provide grants to firms for members of staff completing Open University courses in implications of microelectronics, and in associated product design.

The Manpower Services Commission (MSC) has been responsible for much training and placement of workers. Our previous report outlined its work around IT. An additional £20million was awarded to it in October to finance more apprenticeships, particularly in engineering.

Returning to youth problems in particular, a plan to set up IT centres, mostly in inner city areas, was prepared over the autumn. They will be established by the MSC with YOP funding, and under the Department of Industry. They are to be modelled on a successful experiment in Notting Dale (London) where programming and applications skills have been developed among young people. A small number of centres are initially to be established in London, Liverpool, etc., with the aim of procuring sponsorship for courses from local firms and authorities. During 1982, up to 30 will be established. In Leeds, the East Leeds Womens Workshop has received grants of £210thousand from the European Social Fund and local authorities to develop training courses for women in electronic and computing: the aim is to cater for women over 25, perhaps with children, drawn from the local area of high female unemployment.

(vi) Awareness Activities

Mention has already been made of the unanticipated interest displayed in the BBC's computer course. Various other initiatives to do with Information Technology Year have been announced. As well as research initiatives - into using electricity mains as a data transmission system (for meter reading and energy management) into teleshopping, into public access data banks - public awareness activities will include competitions, exhibitions, and open days.

So far, however, awareness activities have had mixed success. Acording to a report in the Guardian (9.11.81): "Eighty per cent of the British public have never heard of information technology, yet 53 per cent believes it is essential for Britain's future prosperity. The second of those results from an opinion poll conducted for the Government by MORI was announced yesterday. The first was not published".

The Greater London Council announced that local efforts were to be made in conjuction with IT year. A computer demonstration workshop is to be set up in County Hall to provide experience for community groups, businesses, and the general public, with word processing, Prestel, terminals, etc.

3. Social Groups

(i) Trades Unions

Trades Unions continudd to adopt a cautious attitude to IT. While the strategy of achieving New Tachnology Agreement (NTAs) was still given much priority, Computing magazine, in its survey of the year, noted that rather few were actually signed. Researchers have also noted that the majority of agreements concern white

collar workers, for they are not necessarily advantageous to other groups of workers with established agreements over working conditions. The lack of support to NTAs given by the Confederation of British Industries (CBI) despite the initial welcome to the scheme by its staff also took away some momentum from initiative.

One autumn conflict actually involved the Department of Industry itself, which seeks to introduce viewdata into London and a number of regional offices in 1982. The Society of Civil and Public Servants is demanding that the 40 terminals be introduced within the guidelines of an NTA, and have threatened strike action. Minister of IT Baker expressed some support for the idea of an NTA after meeting union officials in December. Another dispute is underway in the Department of Health and Social Security, over introduction of computers. And in the private sector, the Banking, Insurance and Finance Workers Union is challenging National Westminster Bank to n negotiate an NTA over computerisation.

(ii) Employers.

Following the refusal of the CBI to fully support the idea of NTAs - apparently because of reservations about releasing information on firms' accounts and general restriction of management flexibility - there has been rather little in the way of general pronouncements about IT. The basic theme - that UK industry has to use IT to remain competitive, otherwise more jobs would be lost - remains the same. Thus, on being named 'Businessman of the Year' in December, the chairman of Racal Electronics, Sir Ernest Harrison, added his voice to those arguing that British industry, in order to successfully reshape itself to meet modern conditions, required more direct government support in those crucial areas.

(iii) Agreements

A listing and analysis of NTAs has been produced by researchers at the Technology Policy Unit, University of Aston, Birmingham, in a study of 'Trade Union Policy for New Technology'. A report on this work by R Williams and R Moseley, given to the FAST conference 'Information Technology: Impact on the Way of Life' in Dublin (November) recorded 86 NTAs (mostly between 1979 and 1981). Virtually all concerned white collar workers, and more than half were in manufacturing. Although the reorganisation of production around IT challenges convential demarcation lines, most NTAs only had one union signatory. (This may make the recomposition of skills into new, more integrated jobs, more difficult). The majority of NTAs still involved only limited and short-term work conditions issues.

(iv) Other Organisations

In addition to groups discussed in our earlier document, we should note the group Women and Computing, which held a conference in September 1981 at Brighton. This included both discussions for women in IT industries, and workshops allowing novices to experience the equipment. Several local groups have been started as a result of this effort by women to overcome some of their isolation and subordination in a traditionally male-dominated area.

Issues of privacy and surveillance surfaced a number of times during the autumn. Embarassingly for the Thames Valley Police Authority, which had just announced that it was to embark upon an expansion of its computerised 'local intelligence' system, the investigative journalist, Duncan Campbell, reported

in the New Statesman that he had been able to obtain information from the data bank - for a fee - from a private investigator. Indeed for a fee, information seemed to be available from a whole series of 'secure' police computers. The Thames Valley system, it is now known, has some 10% of the local population on file, daily collecting data on some 120 people, 45 vehicles, 125 addresses, 170 events - and 50 crimes - and will be expanded to cover 15% of the population (half of these having no criminal record). At a cost of £3 million it is regarded by still libertarian groups as a worrying portent to future developments.

Data banks in general have been the subject of several interventions. The government continued to argue in the autumn that the Home Office should police data banks, proposing a public register of all electronic files of personal information. The Labour Party conference, however, where it was claimed that the Home Office was the 'main culprit' in abusing data banks, called for an independent data protection agency. The British Medical Authority is warning that it will refuse to cooperate with plans to store all hospital patients' records on computers unless such an agency is established. On the other side, concerned about costs, the Computer Services Association criticized the government proposals as too weighted against IT: manual files of personal information should not be exempt from any legislation, they argued. In December The Times ran a story suggesting that the government was now considering a 'computer ombudsman' with a small staff as a compromise with the idea of an independent agency.

(v) Labour Disputes and Other Conflicts

Reference has been made above to a number of industrial disputes concerning IT. We might also add a strike at Lucas

Aerospace, Birmingham from October to December over the installation of visual display units. In this case the unions argued that higher wages should be paid to workers changing over to them: at present the VDUs are remaining unused until the issue is resolved as part of the annual pay negotiations.

Apart from conflicts about IT, conflicts may involve IT. After the selective use of computer staff in the summer's civil service strike, the autumn saw Post Office workers disrupting the issue of telephone bills. This was accomplished by having a few hundred workers strike at computer centres: among other consequences, the introduction of some Prestel services was delayed. The reason for the conflict was dispute over a pay claim, in particular the question of parity between engineering and other specialist grandes.

4. Research

(i) Technical R&D

The autumn of 1981 has been notible for a number of local initiatives around IT, often combining industrial incentives with R&D assistance.

In London, Islington Council together with North London Polytechnic are collaborating on Project Manhattan, designed to create 200 jobs through an IT workshop for companies to use. The Polytechnic would provide R&D services and equipment Imperial College has set up a software development unit. And, less, research-created, The Greater London Council is to develop Technology Centre in Whitechapel at the cost of £1 m, for new, high technology companies to develop and display projects.

Elsewhere, Swansea University set up a microprocessor centre in the autumn, employing 3 staff and using micro-computers, which will act as an MAP consultant to industry. The Scottish Development Agency announced in December that it was to set up a laboratory at Herriot-Watt University, Edinburgh, to allow researchers to develop IT applications for small firms at low cost. Aston University too, is proposing to develop a science parks (of which a number we already estabished in the UK, including one at Herriot-Watt).

(ii) Social Implications

The FAST conference in Dublin provided an unusual opportunity for British and other European researchers on social aspects of IT to interact. It was rather clear that while research into the workplace was well advanced, there was very little material of substance concerning most other areas of life. Exception were J Bessant and K Dickson's analysis of the non-adoption of IT by many manufacturing firms (now published as Issues in the Adoption of Microelectronics, London: by Frances Pinter) and J Gershuny's analysis of changing patterns of time use as related to economic and technical change (in press).

One point that did emerge clearly from a number of studies of IT at the workplace was the very high degree of flexibility of the technology. CAD and CAM, it appears, may be introduced in substantially different ways, with very different 'impacts' on jobs and employment. To a large extent this involves both job and technology design, and reflects the different priorities that may concern mergers - labour control, product standisation, skill shortages, variable quality of new materials, energy costs, It was noted that social groups concerned with the social relations of IT largely took the design of technology for granted, thus restricting their opportunities for intervention.

(iii) Alternatives

No maturation of ongoing attempts to develop alternatives is evident in this time period, but it may be significant that Mike Cooley and Hilary Wainwright, associated respectively with the alternative plans for Lucas Aerospace and Vickers Industries, have both been given posts of economic advisors with the Greater London Council. The Campaign for Nuclear Disarmament seems set to place more emphasis on alternative production as well as on alternative deface strategies: it hosted a seminar on 'conversion of military industries' in November. As a rapidly expanding mass movement, able to mobilize over a quarter of a million demonstrators in October, its initiatives here may be very significant. Mary Kaldor's book, The Baroque Arsenal (London: Andre Deutsch) related British industrial decline to our patterns of military expenditure, and seems likely to promote controversy for sometime.

5. Experiences in Specific Sectors

Introduction

As indicated in our last report, the growing severity of the current recession has tended to dominate reports of developments in British industry as a whole. Steadily climbing figures for the unemployed have now reached the 3 million mark. In percentage terms the unemployed now account for nearly 10% of the civilian labour force - a figure that is ominously close to the 11% unemployed recorded in the UK in 1930 at the beginning of the depression. Unfortunately UK performance in this area is matched by that of many other OECD countries - likewise their current unemployment levels are equal to or even exceed those recorded in 1930.

Matching this rise in unemployment is a correspondingly disturbing drop in the rate of growth of productivity in almost all OECD countries - in the last year for given figures, Britain's productivity growth rate declined from an already low 1.2% in 1972 to a 4.2% in 1980. Forecast rises for 1981 are thought to be largely due to the effect of growing unemployment on the macro figures. Other OECD countries are experiencing similar problems but the UK slow-down has significantly affected the international competitiveness of British industry vis a vis its main competitors among the industrialised countries. Loss of market share at home and abroad must be the inevitable result of declining productivity with the ultimate cost being paid by those who lose their jobs as a consequence.

It is impossible to say with any certainty what percentage of those people who lost their jobs in the latter months of 1981 did so as a result of the introduction of microelectronics related innovation (MRIs). Certainly if the productivity figures are to be believed an important paradox is emerging - the job displacing effects of the new technology have traditionally been put down to the increased labour productivity of the innovations being introduced. If MRIs were being introduced on a wide enough scale to cause significant job losses then there should be a corresponding increase in productivity growth - this clearly has not happened on a large enough scale to have an impact on aggregate figures although developments in some specific sectors still support the job displacement hypothesis.

Nevertheless, it is at least arguable that given such a dismal record of productivity growth, any investment which reverses this trend should be encouraged even if it leads in the short run to more unemployment - this may be outweighed by the longer term benefit of a more competitive industrial sector. This is the dilemma which faces industrialists, trade unionists, government and academic observers alike - however for some time yet the severity of the recession is likely to obscure and confuse the debate over technical change and employment.

Below we give a brief summary of notable developments related to MRIs in specific sectors. As it covers only the three month period since the last report, the coverage is somewhat less comprehensive. For the next report we plan to review the findings of a number of longer research reports related to the topic which will be released in the near future.

(i) Offices

Developments in this sector have been characterised recently by a plethora of announcements by major companies such as Racal, Rank Xerox, Plessy, GEC, ICL, and ITT of their intention to manufacture an incredibly wide variety of office equipment (there are over 100 suppliers in Britain) which will be backed up by a massive marketing campaign in the coming months to hasten

the diffusion of the new equipment through UK offices. Much of this equipment is being sold as part of a package of hardware and software which are tied into sophisticated data transmission systems which can link up geographically separate offices. For instance Rank Xerox, which recently announced a new line of electronic typewriters for sale in the UK, also offers a link up through its "Ethernet" data transmission network.

To a certain extent the big companies are following the lead of much smaller firms like Xionics and Office Technology Ltd. who have been in the sector for two years already (a lifetime in this area) and who have won large contracts with the Cabinet Office and British Leyland to supply new office technology systems. The majors, unused to such successful competition from small firms will be striving mightily to establish a niche in what will prove to be a rapidly growing market in the next few years.

This flurry of competition is being accompanied by the advent of sizeable measures of support from the public sector via the previously discussed activities under the heading of IT year. GLC and other local councils such as Nottingham County Council, Surrey Docks, and Milton Keynes are investing in office technology systems - £6 million in the case of the GLC, partly to increase efficiency and partly as "showcase" operation to encourage other potential users.

Many of these potential users are thought to be still sitting "on the shelf" waiting for the pressure of competition to force prices down and lead to systems which are much improved over those available at the present time. As these levelling off pressures take hold, we would expect office technology to be even more competitive with the office workers than they are now - leading, almost inevitably to job losses.

A related trend which seems to be emerging with the spread of new office technology is the increased use of part-time workers to perform specific tasks either in the office or at home using their own terminals and work stations. This trend already common in the US has recently been reported to be on the increase in the UK. Both Manpower UK (a subsidiary of Manpower, USA, the world's largest contract labour organisation, and F International, a computer systems company based on programmers are playing an important role in this area. The former company acknowledge that the use of British firms of highly skilled staff on a temporary basis is increasing dramatically as the permanent office job market shrinks due to the shift of Britain's economy towards an information technology base. F International conversely, employs more than 600 freelance programmers and word processor operators to perform the task at home. Both examples suggest continued reductions in permanent office jobs.

The other side of the coin of the above discussion relates to the people whose jobs are being affected by the use of office technology. Examples continue to surface of offices reorganised around new systems having greatly reduced staffing requirements - one prominent London estate agent effected an almost overnight reduction of its typing pool from 25 to 5. Unions continue to reject arguments about low job loss in the sector as a result of the use of office technology and point to a recent Alfred Marks report (a leading UK contract labour organisation for the office sector) which estimates at least a 13% reduction in office jobs due to new technology. Both NALGO and APEA officials believe this is a serious underestimation. They believe that the use of office technology growing at about 30% annually will devastate the UK's 2.2 million strong office workers.

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(ii) Banking, Insurance, Finance

Developments in the banking sector continued to dominate in this area. As the result of an agreement recorded 19th November 1981, between the chief executives of Barclays, National Westminster, Lloyds, Midland and Williams and Glynns, UK high street banks have taken a major step towards the cashless society. They have agreed to harmonise their attempts to introduce points of sale terminals in shops which allow customers to direct debit their account for transactions. The system will operate via British Telecom's communication network, will save time, money and effort spent by the Banks on developing competing and incompatible systems. Each bank is now free to reach its own deals with retail shops, which will use systems able to accept a very wide range of cards. Though still a few years off, this development is another significant element behind fears that many jobs will be lost in this sector in the next few years.

Another element is the use of automated teller machines in the banks themselves - these are spreading rapidly. Lloyds Bank has the most with well over 1100 machines installed, National Westminster has over 500 now and will have a 1000 in 1983. Barclays, Williams and Glynns and Halifax Building Society are all putting ATMs in their banks at a much faster rate than predicted earlier. NCR, leading ATM manufacturer expects that 90% of all routine personal cash withdrawals will be done by ATM by the mid 1980s. Already a common sight in some banks with ATM, is a queue in front of the machine while the human tellers sit waiting patiently for the custom which justifies their job.

Home banking is also developing rapidly. Here banks in the US and West Germany are far ahead of the UK in terms of the development and testing of home banking systems. Chemical Bank, Citibank, Chase Manhatten, Manufacturers Hanover and Verbrauchen Bank and Deutshe Bank all have home based systems operating at the moment with plans to increase their use dramatically in the near future. Verbrauchen Bank introduced home banking only recently and already claims to have 90,000 accounts.

Barclays Bank is the leading UK bank in this area. Within 12 months, Barclays will be able to offer its major corporate customers self-service banking on their own premises. National Westminster is also close behind Barclays in this race. Barclays, however, is the first bank to be granted a Prestel "gateway" license which allows Prestel subscribers access to Barclays customer files - and hence able to check the status of their accounts using the Prestel/TV link-up. This use of TV based systems in the UK differs from the trend in the US, where the banks will try to get customers to buy their own terminals.

The Banking Insurance and Finance Union, which represent 72,000 members in the big 5 banks, is currently in dispute with Midland Bank over its plans to reduce head office staff by 4000 over the next four years due to computerisation. BIFU has officially adopted a policy of non-cooperation with the introduction of new machinery unless prior agreement has been reached with the union. The union clearly recognises the hand writing on the wall however, by saying that they strongly support any moves which will increase banks profitability (already among the highest in the whole economy) since this in the interest of their members. Their decision to push for consultation rather than imposition seems the sensible course to choose - it is however unlikely to do much to stop the inevitable reduction in employment in the sector.

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(iii) Retail Sector

The most significant retail sector developments relate to the use of Laser scanning electronic check out systems in supermarkets. This is a market estimated at some $1100 m by 1984 by which time some 5000 supermarkets throughout Europe are expected to have laser scanning systems installed compared to about 250 now. In the UK all the major chains are experimenting with the system - Sainsbury, Co-op, Asda , Mainstop, etc. and Tesco has

just announced plans to install laser systems in some 15 stores next month. Tesco plans to spend £100 million on this equipment in the 1980s.

The laser system which works by reaching out the relevant product/price information from bar codes on the products, provides great improvements in in-store efficiency since the system is highly accurate and much quicker than manual checkout. They are also the first step in automated stock-keeping, stock-taking and re-ordering systems where the stores computers are hooked up directly to potentially automated warehouses - these systems are already in wide use in the US. The trend points unmistakably towards much more efficient stock control and greatly increased productivity for fewer workers. Another retail development with direct job displacement effect is mirrored in the recent announcement by Hepworth; (a major men's retail clothing chain) of the £2.4 million investment it is making in automation. The Hepworth group has introduced computer based credit systems, automated warehouse ordering systems which improves the order/delivery time for items by some 300% financial modelling and automated payroll systems as well as point of sale terminals in retail shops. So far 80 shops out of 350 are connected and plans are afoot to connect all of these, as well as the 250 shoe and ladies-wear shops it controls.

The company introduced automation specifically to keep staffing levels down. It has succeeded admirably - in just its point of sale application alone the company effected a salary saving of more than £77,000 last year alone.

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(iv) Printing Industry

There are no relevant activities to report under this heading though we shall be discussing new research in this area for the next report.

(v) Telecommunications

Progress in the development and installation of the new System X telecommunications systems continues to be slower than earlier forecasts. The reasons for this can be found both in the past - the system took much longer than expected to develop due partly at least to insufficient cooperation between the firms involved - GEC, Plessey, BT and STC - and in the present where a shortage of microelectronics design engineers is delaying further development of System X replacement for the big local exchanges which make up most of the UK network.

Paradoxically this delay could have beneficial employment implications in the short term at least. British Telecom has announced plans to spend £600 million on producing and installing 190 phone exchanges using 1960s technology as a stop gap measure until System X exchanges are ready. These exchanges called TXE4A - are to be built by GEC, Plessey and STC and the orders placed over the next 3 years are expected to provide work for about 100,000 people in making the equipment and another 100,000 in terms of indirect employment benefits. The production of digital exchanges requires about half as much labour as the TXE4A types. There is a cost attached to these stop-gap measures however. It is arguable at least that the workers employed producing TXE4A exchanges will be using outdated skills unlikely to be required in the production of System X exchanges a task for which some will undoubtedly be retrained while for others their longer term future remains much less certain.

Other elements of the new telecommunication system planned for Britain are also taking longer to fall into place. Prestel, BT's two-way viewdata information system has not diffused to residential markets as rapidly as had been forecast. A year ago more than one million Prestel sets were forecast to be in common usage by the mid 1980s. Now these forecasts have been revised downwards to about 250,000 subscribers. Prestel's original marketing strategy relied on mass production by TV set manufacturers to bring the price down to a level which could be afforded by individual families. This has not yet happened and at £500 for a set and adaptor the 13000 systems in use at present have been purchased primarily by businesses. This is the market that Prestel intends to pursue at present leaving exploitation of the much larger and more lucrative family subscriber segment until circumstances change.

The slow diffusion of Prestel systems is also likely to hold back related components of the telecommunication system equipment such as electronic mail - a service linked to Prestel and hence for the foreseeable future able to be used only by the business community subscribers mentioned above. The provision of other "electronic mail" type services by the Post Office are going forward in some cases ahead of schedule. One of these, the electronic transmission of bulk mail has moved from drawing board to pilot trial in 6 months - compared to more than two years for the US plan. Under this system companies who send circular letters, such as building societies and credit card companies, give the letters, texts, names and addresses to the Post Office for electronic transmission and dispatch from regional centres. Only a limited service will be provided at first - between London and Manchester and letters will be transmitted at a rate of 100 words

a second. Laser printers transfer the information automatically to paper and then place in envelopes at the rate of 6000 per hour. Much faster systems are planned once the service is established and expanded and costs should in time under cut bulk-mailing costs to the customer - including of course, the firm's labour cost associated with sending the letters, even though postmen will still be required to deliver the letters at the other end.

One of the problems related to the slow and costly development of System X in the 1970s which is likely to have negative employment implication has been UK inability to establish a market niche at the international level. The scale of the international market for telecommunication equipment is of course enormous. Having the capability to capture a share of that market can have significant employment effects. Yet in their first attempt to win a major contract to supply video text systems (a British invention) to the West German Bundespost, a consortium of GEC, BT, Aregon (a software firm) and AEG Telefunken failed to secure the £11.5 million contract.

The contract went instead to IBM even though the system used by the West German's on a trial basis was supplied by the same consortium. The failure to win this contract is seen by many as a sign that British dalliance in the 1970s during the development of System X and related technologies will mean the exclusion of British products and processes from the international market. There is a very real possibility of course that it is this sort of non-competitiveness that may have more severe employment consequences than those arising from the domestic use of MRIs.

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(vi) Education Teachware

Developments under this heading have largely been covered in earlier sections.

(vii) Manufacturing

As we have mentioned the daily reports of ever more workers losing their jobs in manufacturing due to the recession is by far the most notable feature of the manufacturing industry over the past few months. In relation to the new technologies the most significant characteristic of the period has been the number of reports which have come out which are concerned to analyse the performance of British industry in developing and introducing MRIs. Two themes are common - first that British firms are still lagging behind their counterparts in other OECD countries in exploiting the potential benefits of the new technology, however, there are signs that conditions are beginning to improve.

Two studies highlight this aspect. A report by the Policy Studies Institute "Microelectronics in Industry: Manpower and Training" based on a survey of some 1200 manufacturing enterprises found that firms using microelectronics still only represent 55% of total manufacturing employment. Only 13% incorporate chips in their products and 45% use them in some form in production. 70% of the firms surveyed reported no change in employment as a result of the use of microelectronics and 60% forsaw no changes in the next 18 months. In terms of jobs gained and jobs lost, firms using chips in

in products tended to create jobs while firms using them to automate production found just the opposite and shed jobs. The important conclusion is that in both cases the shift either way was less than 10%.

A second study also by PSI but available from NEDO "Microprocessor Application in HVACR (Heating, Ventilating, Air Conditioning and Refrigeration) Products", shows that the industry's continued presence in growth areas is dependent on its ability to respond to the microelectronic based technological changes currently taking place. Last year output fell by 7% and exports dropped by 16% - largely due to international competition from producers of MRIs. Although the study did find that some 76% of the 29 companies interviewed did have a capability to develop microprocessor based products (compared to 21% 2 years ago) neither of the 4 leading UK air conditioning manufacturers nor their control equipment suppliers had undertaken feasibility work in the area. No explanations are given as to why this should be so.

The second theme of the newest crop of studies is that seems to be a widespread consensus emerging that British industry must do much more to hasten the diffusion of the technology as the only means of staying internationally competitive. There is a corresponding amount of emphasis on the need for even more (or better) government intervention to facilitate this process. (See earlier discussion of government support for CAD and Robots).

A number of studies and new initiatives along these lines have been announced and should be noted. Firstly, the National Electronics Council has published a report "Adapting to the Information Society" which argues for the development of a national plan for the use of information technology at all levels in society but particularly in industry and advocates more provision of government funds to support new technology ventures, demonstration factories and retraining. In a related

vein, the Conservative Party's Bow Group published a report "Learning for Change: Training, Retraining and Lifelong Education for Multi-Career Lives" which focussed specifically on education aspects of employment problems related to new technology. Their concern was both with those in mass-employment jobs as well as in the professions and the group proposed a broad series of steps to deal with the coming changes ranging from changes in National Insurance and pension schemes to encourage early retirement, reform of copy right laws, to encompass new forms of education teachware, more and different vocational training schemes, and promoting school-industry links.

On the latter point Aston University has joined Warwick University, Birmingham University, Peterlee Industrial Park, Heriott Wall Research Park, Trinity College, Cambridge Science Park and Birchwood Sciences in setting up "science parks" which are intended to encourage closer links between University faculties, high technology industries and city councils keen to attract new industrial initiatives. While many of these "parks" will not include traditional manufacturing industries their output nevertheless should be a significant stimulus to the diffusion of new technologies to downstream sectors.

In marked contrast to all this emphasis on encouraging the diffusion of MRIs concerns about the employment consequences arising from those uses of the new technology seem to be much less pronounced in the media and in government statements. Though these concerns are undoubtedly still being voiced in other forums (see earlier discussion) they are tending to attract less attention. And the onerous prospect of recession related unemployment being visited upon firms which have not been squeezing every possible margin of profit to survive must have a depressing effect on the desire of workers and management to enter any protracted struggle over the "amorphous" effects of new technology.

This is probably particularly true in smaller firms though there are signs that some of the larger firms are themselves (particularly on the labour side) giving way to the inevitable march of technical progress.

It would be a great mistake, of course, to allow this downgrading of concern with social implication to be resigned to a low position on the agenda in the public debate; particularly since as the above studies show the diffusion of MRIs is taking place - slower or faster than expected as the case may be - it is nevertheless occurring and the problems remain. These problems are highlighted by two specific developments. Firstly, an eight week strike at Lucas aerospace over the introduction of VDU/CAD systems has just been settled. The strike involving 1200 (out of 12,000 aerospace workers) centred around the company's refusal to pay workers higher wages for using the new system. The union pointing to the division's high productivity would not accept this and the issue is now to be negotiated in the annual round of pay negotiations. Two points are relevant - the Lucas workers had the cushion of a highly profitable division to support them, a weaker firm perhaps could not have withstood the strike at this time; secondly, there was some indication that the company did try to use the excuse of the recession to push through the new technology without consultation.

Another aspect is illuminated by ICLs proposed 17% cut in its 30,000 staff. The redundancies are to be largely borne by production and maintenance workers and by office staff. None of the company's technical sales people are affected, and only limited redundancies will be imposed on other specialist staff i.e. research and software staff.

The implications of this are clear - fewer more highly specialised people will be used to produce more sophisticated products by the use of more automated methods of production. The largest single cuts are to be made (1700) in the production force, with the rest coming from UK and overseas marketing - where jobs will go among support staff and not among front line technical salesmen - and from corporate headquarters where 1200 office staff are to go. The company intends to increase its use of automated equipment on all levels and to shift more resources into software and services rather than in hardware production. Hence this example highlights the most important (and related) aspects of the problem raised by the use of microelectronic technology in manufacturing - those workers who lose their jobs basically do not have the necessary skills to make them an asset to firms using the new technology, yet, the use of the new technology is essential to the future survival of the firms.

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CONTENT

Introduction

In Belgium, the interest in the social impact of new technologies is just beginning. A major effort to evaluate the social-economic and overall societal consequences of ME is being mounted by an interdisciplinary working party (with 10 subcomittees) of the National Council for the Promotion of Science. Other studies are underway.

Up to now, no major industrial conflicts have been caused by the introduction of new technology. A major collective agreement has been concluded in only one branch, namely - as one might suspect - in the press sector, reserving the technical job to the printers. However trade union interest is growing. The Flemish Christian White Collar Workers union, (L.B.C.) devoted a threeday Congress (1981) to the theme; in both the Christian and Socialist Confederations working parties have recently been set up. Proposals for frame work agreements - in the sense of the Nordic Data agreement - have been drawn up by some trade unions. Some employers federations have evaluated new technology for their sectors and drawn conclusions for education, training and retraining systems.

This paper covers :

I. Government activities
II. Trade Union views
III. Employers views
IV. The press sector collective agreement
V. Research

I. GOVERNMENT ACTIVITIES

1. Promotion of Research

The development and promotion of new technology is one of the fundamental goals of the Belgian government. Within the framework of the overall science policy the Services for the Science Policy Programme ; the programming of aid to technological research.

Since 1970 different R & D programs were sponsored by the Government. Thus the National Programme for Research on Informatics. This programme launched in 1971, aimed at increasing the scientific potential of the Universities and the development of software for the public sector. It focused on problems concerning administrative databanks and teletransmission of information, University data banks, computer monitored education, medical and hospital related informatics and the like. An adaptation of the programme in 1978 by the government was intended to bring about improvement in the cost-benefit relation of medical information systems, which were set up in an earlier phase of the programme (supervision of intensive care units, medical files and integration of partial systems in hospitals). The programme ended in September 1981. Other programmes concern Scientific and Technical Information and Documentation (1975) (1), Regional Informatics, examining the information needs (1975-1979), a National R-D Programme concerning Aviation and related technologies (space, telecommunication and others). Belgium obviously participates also in a number of international programmes (EC, IEA, ESA, CERN).

(1) Within the framework of Euronet, an EC project.

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2. The National Council for the Promotion of Science : an overall study.

In 1980 the National Council for the Promotion of Science set up and interdisciplinary working party in order to examine the social and economic impact of micro-electronics in Belgium. The party is chaired by Mr. I. Lindemans, head of the study department of the study department of the Christian Trade Unions and is composed of academics, representatives from both sides of industry, the government and related institutions (Scientific, the National Labour Council, the Planning Office, the Employment Service).

The study focuses on the following topics :

A. Scientific Research

1. Status questions. What is the actual situation in Belgium as far as research is concerned ?

   - An inventory of the research undertaken by Universities, research centres and industry ;
   - What programmes were and are promoted by the national programmes or (other) government initiatives.

2. What is the relation between M.E. research on the one side and its application in Belgian industry, the non-profit sector and the requirement for social and societal innovations on the other side ?

3. Depending on the answer to the previous question, what kind of technological as social research (in the broadest sense) has to be promoted by the national government ?

4. What kind of research policy is needed at European level ?

B. Economic consequences : the application of M.E. in the market oriented sectors of the economy.

1. The actual and future significance of production of ME in Belgium

2. - What types of production are there ?
   - What types should be developed in Belgium and what are the needs of the market ?
   - What is the prospect for joint ventures ?

3. What can the government do to favour such a development through government orders or other interventions (subsidies, regulations, setting of criteria and the like) ?

4. What are the consequences and possibilites for small and medium enterprises ?

5. Conversely, cannot Belgium specialize in products, which will not or only marginaly be influenced by M.E. ?

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C. Social consequences of M.E. in Belgium

Quantitative analysis

1. Is a forecast of the impact on employment for the next 10 years possible ?
Three hypotheses will be examined :

- ME introduced as rapidly as in other countries;
- ME introduced at only half the speed of other countries;
- no additional effort undertaken to encourage the introduction of M.E.

2. Is it possible to make forecasts taking into account a diminution of working time ?

3. Does ME make a reduction of working time - from the technical organisational or economic points of view - easier or more difficult ?

4. Under the hypotheses that in the long run the employment balance would be positive in the (western) world, how to see to it that this would also be the case for our country and its economic regions ?

5. Finally, whatever the impact on employment, can Belgium abstain from the introduction of the M.E. ?

What are the means for its introduction ?

Qualitative analysis

6. What is the qualitative impact of the introduction of M.E. on job content routinizing jobs, reduction in promotion, changes in job qualification and the like ...

7. What will be the impact on industrial relations and how can the present system be adapted to promote more labour participation ?

8. What about the distribution of available work ? How will unemployment be distributed and unemployment insurance be financed ?
How to protect weaker groups, namely women, the young and unskilled labourers and how to integrate them in the employment process ?

9. Given that M.E. is a neutral technology, which can be oriented towards either centralisation or decentralisation, to promote harmonization or deharmonization, a passive or an active solution, how to see to it that the right choice is made ?
What are the societal and personal consequences ?

D. Educational Consequences

1. Given the development of M.E. is it not one of the most important tasks of society to prepare young and old, through training and permanent education, for this new situation ? At what level should these educational efforts be undertaken and how ?

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2. Is it not inevitable that M.E. will be introduced in our education systems ? What is the education potential of M.E. ? What will be the impact on programmes, learning processes, the training and adaptation of teachers ?

B + D. Employment and educational consequences

3. What about more regular movement between periods of instruction, labour and leisure time given the importance of the new situation and in the framework of permanent education ?

The working party consists of 10 Subcomittees :

1. Metal industry
2. Electronics
3. Textiles
4. Chemicals and Pharmaceuticals
5. Distribution
6. Finance
7. Medicine
8. Education
9. Telecommunication
10. Small sized business and self-employed

Up to now, no reports have been published by the working party.

3. Other governmental activities

The Ministry of Employment and Labour's Female Labour Commission organized October 1-2, 1981 a colloquim devoted to the impact of the new technology upon the employment of women. The following conclusions have been adopted:

- the loss of jobs, due to the introduction of new technology may not be solved through the introduction of part-time work, but through a general and drastic reduction of working hours ;

- informatics should be on the programme of our technical schools. Additional training of teachers is indicated.

- new technology may not lead to a return to homework. Human contacts are important.

- conditions of work may not deteriorate

- the installation of consultation committees at the firm level to monitor the introduction of new technologies is desireable.

The Employment Service organizes courses on all aspects of informatics.

The Ministry of Education has not so far undertaken studies concerning the (social) consequences of M.E. However 75 minicomputers were delivered to the (R)enewed (S)econdary (E)ducation for an equal number of schools. The Vth year of RSE has 2 hours "informatics" per week on its programme. Here things are obviously only starting.

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In 1981 INNOVI has been created as a broker for new technology, between Flemish Universities and Flemish Industry, including looking for risk bearing capital. The capital is 20 million BF; 1/3 of which has been underwritten by the Flemish Regional Investment Society; 1/3 by 5 enterprises and the last third by four holdings (1).

II. TRADE UNION'S POINT OF VIEW

Trade unions have recently been paying more attention to the possible consequences of the introduction of M.E.

At its Congress of April 24-26, 1980 the Christian Trade Union underlined in its resolutions on "technological developments" its positive attitude toward technological innovation, but expressed at the same time its concern that this should not destroy employment and that the beneficial consequences should also go to the workers. The CSG demands that the introduction of new technology should be actively monitored. It insists on early information and participation of the workers in decision making : that the new technology should contribute to the creation of new jobs, that job security should be guaranteed as far as possible, as well as qualifications, income and transfer to other functions. Costs related to training or retraining should be born by enterprise introducing new technology. The CSC has set up a working party to study the subject further and make concrete proposals.

The Flemish White Collar Workers Unions, (L.B.C.) affiliated with the C.S.C. took "technological development : a chance or a threat" as the main theme of its congress of 15-17 May 1981. The discussion took place on the basis of a study carried out by Prof. J. Bundervoet (K.U. Leuven) and A. Mok (U. Antwerp) and their collaborators (1). The study consists of three parts. The first part deals with the impact of new technology on white-collar workers on the basis of research in different sectors (banks, chemicals, distribution, press, hospital laboratories and pharmacies). The second part is devoted to the impact on employees of the introduction of new technology. Part III concentrates on the attitude of trade unions.
In its second part the study concluded that it is exceptional for employees and unions to participate in the decision making concerning the introduction of new technology and that, if they are involved, there is not room left for influence, since all relevant decisions have already been taken. The study also concludes that it is difficult for employees to influence technological decisions since the information is hard to obtain, the consequences of the introduction not easy to grasp and because the consequences of the introduction are often contradictory or conflicting for the different groups of employees involved.

On the basis of this study the L.B.C. Congress adopted 105 resolutions, which start from a basic positive attitude towards the introduction of new technology. The main points are :

- new technology should contribute to the humanization of work;
- loss of jobs should be compensated through a better distribution of available jobs and through work reduction of working time ;
- new jobs, especially the better jobs, should be reserved for the present employees ;
- job enrichment ;

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- training and retraining to be paid by the employer ;
- protection of privacy. Only data concerning the employees which are needed for the fullfilment of legal purposes can be stored, with right of information and correction for the employees concerned ;
- timely and full information ;
- negotiation on the nature of the technology and on the impact on jobs (number and content) ; health, ergonomic aspects, safety, privacy ;
- job and income security ;
- multinationals ;
- training of trade union experts.

The L.B.C. proposes to conclude interindustry, industry and enterprise agreements to set the conditions under which new technology can be introduced and is in the process of drafting an overall framework agreement, Nordic style.

The Christian Teachers Union presented a paper concerning education and new technology at a UNESCO Congress, held in Sept. 1981, in Geneva. The following points were taken :

"The New technology and its socio-economic consequences present a threefold task for educators :

- the training of qualified personnel
- the preparation of new generations and the guidance of the present generation in a new (technological) environment ;
- the use of new technology for a qualitative and quantitative improvement of education.

The unions believe that new technology will not eliminate teacher's jobs, on the contrary. Attention is also paid to "self-study" devices, via the home computer.

The Textile Workers Union, affiliated with the Socialist Unions asked its secretariat at its most recent Congress (24-25 April 1981) to follow developments in ME closely, in order to get the necessary expertise; the union asked also for control of introduction and for (re)training.

III. EMPLOYER'S POINTS OF VIEW

The Belgian Federation of Enterprises' Committee on Education, Training and Organization of the Labour-market is currently studying micro-electronics in relation to vocational training.

Fabrimetal, the Employers Federation for the Metal working Industry, has addressed a message to schools in relation to the training required for the metal working enterprise in the 1985 and the 1990's. On the basis of an inquiry in 42 enterprises, a representative sample for the industry, Fabrimetal starts from the fact that there is a gap between technical training in schools and the needs of industry and goes on to formulate its needs and answers the question : what developments does the metal working industry foresee as far as evolution and use of new technologies is concerned, so that schools can adopt their programme, graduates will get jobs more easily and industry will have more qualified personnel ? Fabrimetal is prepared to help schools develop profiles and teaching programme adapted to the 1985-1990 period.

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The Employers' Federation of the Chemical Industry has created a working party, examining scientific and technical information and documentation. The working party has devoted attention to the social impact of ME. This research shows that the automatisation of the documentation services :

- has had no impact on the number of jobs;
- has however led to a number of job transfers : there is less need for operations, but more need for programmers ;
- the level of qualification has been increased and staff potential is better used ;
- no new staff has been hired, but existing staff have been retrained ;
- more time became available for the use of the existing documentation; the consequent better use of documentation improved the use of the documentalists as well ;
- jobs are more dynamic and enriched ;
- finally, automization has not completely eliminated manual handling of documents : both (manual handling and automization) are to be looked on as complementary activities.

In 1975 Mr. D. Janssen (1) in his capacity as Chairman of the Research Committee addressed a letter to the Universities asking for fundamental training of all scientists in the area of "on line research". This proposal led to the creation of a number of new programmes in different universities.

Finally the Federation of Chemical Industries adheres to the UNICE position concerning the confidentiality of data stored in the framework of the Euronet programme. In this position UNICE's stresses the need for discretion clauses in the contracts of personnel employed at the information centres, the limitation of the use of data about specific enterprises and the like.

The Federation of Belgian Distribution Enterprises

This Federation comes to the conclusion that the introduction of new technology does not reduce job content ; on the contrary, the Federation says, studies and experience shows that working conditions become more attractive, a number of boring tasks are automated, decisions and control more decentralized, more time is available for tasks with responsibility and brainwork. The Federation illustrates this by examples concerning purchasing. (e.g. more time for commercial tasks), storing (e.g. elimination of manual handling of goods on the assembly line) and electronic cash dispensing . For the last point the Federation remarks that cashiers, using electronic equipment are less nervous than before since they no longer have to fear failures when entering the prices of the goods sold.

The Federation underlines the greater need for training providing flexibility for employees and for specialists, capable of handling the new technologies.

Finally, the Federation concludes that the introduction of new technology will have only a marginal impact on the number of jobs, since the kind of work to be performed in commerce, warehouses, hyper- and supermarkets and in specialized shops is insufficiently repetitive to be programmed. In distribution most of the work is done manually, supported by machines to lighten the manual effort. Only in the area of informatics will automization play an important role, but here the impact will be tempered by the gradual introduction of new techniques.

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(1) The actual president of the Belgian Federation of Enterprises.

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Moreover, as the Federation indicates, employment increased in 1979 and 1980 in those enterprises in which new technologies have already been introduced (teleprocessing, electronics cash dispensers ...)

Finally, the creation of consultations centres should be noted. Such one was established in Sept. 1980 at the Université du Travail of Charleroi. This service will organize a permanent exhibition of micro-computers and will give advice, especially to small- und medium-sized enterprises concerning the choice of hardware and software, the elaboration of programme and training of purchasers (for the purchasing of additional material and equipment).

IV. THE PRESS SECTOR : THE 1980 COLLECTIVE AGREEMENT

National collective agreement was concluded on the 6th of February 1980 between the printing unions and the Belgian Press Association in which a clear demarcation was made between the tasks of journalists and printers. The employers had tried to introduced a work scheme whereby the journalists could store their texts in the computer memory as well as texts coming from news agencies and from other data sources, recall texts, and redraft directly on the computer.

This provoked a tough reaction from the unions, which demanded that the technical tasks of fabrication be exclusively reserved to the printers. The Federation of Belgian Press (journalists) immediately acknowledged that they did not want journalists to engage in technical jobs. After a stoppage of 2 hours on December 27, 1979 a collective agreement was negotiated. It was agreed that the introduction and manipulation of texts, electronic printing (through film, disco ...) intended to fabricate printing plates for rotary presses for newspapers, or equivalent products, would constitute a monopoly for the printers. The same goes for the advertising department. It was agreed that printers could work in the writing rooms and/or in the advertizing rooms. Job classifications were adapted. The agreement also covers protection of the health of the employee : work with screens has to be organized so that it is neither protracted nor continuous. A minimum standard has been built in : maximum 2 hours intensive and continuous work on the screen and alternative work for 10 to 15 minutes minimum, before starting a new period of two hours. Job security and income security are provided for. Training for new techniques is preferentially reserved for employees of the department concerned in the absence of sufficiently qualified employees, workers of other departments of the same enterprise may be called upon. Employees leaving the enterprise voluntarily or through retirement or death will not be replaced, ih such replacement is not justified.

V. RESEARCH

Research on the social impact of the introduction of new technologies is only starting and still meager, both as concerns content and number of researchers involved. The following is a list of the most important studies undertaken :

1. Impact on employment in the group GB-INNO-BM (distribution) (French) (Sept. 1980). Research undertaken with the guidance of Prof. Thys (U. Bruxelles), Van Lommel en Thiers (U. Antwerpen).

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2. Technological development, a chance or a threat. (Flemish) (May 1981). See above, under II.

3. Trade union strategy and technological evolution in the electronical sector. (Flemish) (Sept. 1981). A sociological inquiry by Prof. Bundervoet en Martens (U. Leuven) concerning information and trade union reaction in three multinational enterprises.

4. Societal consequences of the introduction of the chip technology (Flemish) (Dec. 1981). An historical, sociological and economic inquiry by Profs. Van Rompu en Devreese focusing on the qualitative and quantitative impact on jobs and the relationships between organization - technology and labour - management.

5. Quality of work (Flemish) (1979-1982). A sociological analysis of the relation between technological developments and labour market problems undertaken by Drs. F. Van der Auwera, under the guidance of Prof. A. Mok) (U. Antwerpen). Case studies will be undertaken in the insurance and hospital sectors.

6. Social consequences of M.E. (Flemish) (1981-1982) Study undertaken by the same team as under 5 and which concentrates - cia interviews - on a qualitative analysis of the information processes in the insurance sector.

7. Micro-electronics in the Service Sector (English) Study undertaken by the same team as 5 which envisages an international comparison of the effects of M.E. in a number of tertiary enterprises ((banks, hospitals, distribution ...) on the basis of case studies. Countries involved : Belgium, France, F.R. Germany, Poland, Yugoslavia, the U.K. and the U.S.A.

8. Technological evolution : study of its effect on job and consumption (French) Ergonomic or psycho-sociologic study under the guidance of Prof. Gaussin (U. Louvain). This study concentrates on changes in job content and the mental and nervous burden for the individual, as well as the societal changes (organization of behaviours of groups and persons) due to informatics.

9. The consequences of telematics for the organization of work (French) Study undertaken by Prof. Pichault M.F. (Law, U. Liège)

10. Consequences of automation for the organization processes of an enterprise. Study undertaken by the Igher Institute for Labour (Sociology - U. Leuven)

11. Ergonomie (French) Sept. 17-18-19, 1981 Prof. GAUSSIN organized at the U. Louvain an international congress on "ergonomy of mental activities" related to new technology. 400 participants were present and 60 communications were given (1).

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(1) Programme définitif. Résumé des communications, 75 p.