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NEW INFORMATION TECHNOLOGIES AND SOCIAL CHANGE

in the areas of employment, working conditions, education and vocational training.

Communication of the Commission to the Standing Committee on Employment

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NEW INFORMATION TECHNOLOGIES AND SOCIAL CHANGE

1. INTRODUCTION

1. In November 1979 the Commission sent a communication to the European Council setting out a strategy for the development of information technologies in the European Community ("European society faced with the challenge of new information technologies- a Community response" Com(79)650 final of 26.11.79). Subsequently the Standing Committee on Employment (26.2.1980), the Advisory Committee on Vocational Training (2.7.1980) and the Council and Ministers of Education (27.6.1980 and 22.6.198)1 discussed the implications for employment and social policy as well as the likely repercussions on education and training.

2. Following these meetings, the Commission's services have undertaken a number of preparatory actions, which are reported upon in this paper. These actions complement other ongoing activities, notably with regard to long-term research, science and industrial policies (e.g. FAST Programme, pluriannual programme in the field of informatics (1), promotion of microelectronics (2), recommendation on telecommunication (3)).

3. The term new information technologies covers a wide range of overlapping innovations, ranging from telecommunications to computing and microelectronics. They have sparked off changes throughout society and the industrial world. In view of the close connection between the different technologies, changes cannot be completely isolated from other industrial and social developments. This paper is, however, primarily devoted to the problems posed by the introduction and development of new information technologies for employment, working conditions, education and vocational training. It responds to the Standing Committee on Employment's demand that a further meeting be devoted to the subject of new technology and that previous discussions be followed up by :

- summarizing the progress made so far;
- identifying relevant issues for further examination;
- establishing the main lines for further activities at Community level.

4. This document is intended to serve as the basis for discussions at the Standing Committee on Employment on 3 November 1981. It should noted that the Advisory Committee on Vocational Training has also be met to discuss these issues on 30 September 1981. The Commission will pursue its activities and formulate proposals for further action in the light of the conclusions reached at these meetings

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(1) Decision 79/783 EEC of 11.9.1979
(2) Proposal for a Council Regulation on Community actions in the field of micro-electronic technology - COM(80)821 final of 1.9.80.
(3) COM(80)422 final of 1.9.1980.

2. PROGRESS TO DATE

2.1. Progress at national level (1)

5. During the past years there has been a growing debate in the Member States concerning the relationship between technological change and social change. Government activities in support of the application of microelectronics and telematics vary as to their scope, scale and conditions. Three major trends may be distinguished :

- several governments have sought to modernise industry and create employment particularly in small-and medium sized enterprises, by means of promotion centers or by assisting early introduction of key technologies based on expert reports or advisory groups (e.g. NORA/MINC in France or the RATHENAU COMMITTEE in Netherlands).

- in all countries - although with varying intensity and organisation - the knowledge and awareness of information technology has been improved through research programmes, seminars, publications and hearnings. The research activity (particularly in the U.K., Germany and France, to a lesser extent in Italy, or the Netherlands) has partly arisen throuh existing public programmes aimed at humanising the working environment. These have contributed to the diffusion of scientific knowledge and, where appropriate, to the establishment of norms. A special effort has been made by the German government, for example, to establish a "technology dialogue" between representatives of government, science and the two sides of industry.

- several Member States have urged the redesign of educational programmes at all levels of the educational system. The object is to achieve early training and retraining of qualified technicians and the promotion of basic knowledge about technological innovations in compulsory schooling. In the U.K. for example, all schools are being given state support (half of the cost) to purchase computers, and the BBC broadcasts a programming series with a home computer promotional tie-in. Most countries have set up national structures, or review bodies, in order to examine the potential of the new information technologies with a view to developing a plan of experimentation and development for the future.

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(1) Reports are in preparation which (i) give detailed descriptions of the developments in several Member States and (ii) summarise recent initiatives and policy developments so far as education and training are concerned.

6. Trade union strategies for coping with technological change vary with industrial structures, existing procedures and traditions of labour relations. However, over the course of time certain tendancies have emerged. In the beginning, the main concern was with the employees' share of the benefits of increased productivity achievable by new technology, and the prevention of its negative social consequences. Since then emphasis has shifted to the question of the regulations and negotiation of collective agreements, as have pressures to modify vocational training systems.

7. There have been a number of agreements at sectoral and company levels, especially in the United Kingdom, Germany and Italy. In some cases, clauses have been included in existing agreements, as a result of the introduction of new systems, of job redesign, of wider rationalisation or as part of an overall package of changes in working conditions and pay . Some of these agreements have been concluded only after serious labour disputes (e.g. in the printing industries in U.K. and Germany). New information technology has sometimes meant new areas of union involvement. In Germany and Denmark, for example, they have set up information bureaux. In the U.K. a joint TUC-CBI statement was negotiated (but not ratified). The introduction of new technology raises a host of issues, all of which call for a trade union response. Accordingly, their demands extend beyond the normal scope of collective bargaining. They also involve debates over more adequate education systems, the protection of privacy or such matters as "technology taxes".

2.2. Progress at Community level

8. Actions have been taken at Community level complement and extend the steps undertaken in the Member states. The priorities of the Commission with regard to technology and social change are along the lines defined in earlier documents and in the discussion at the Standing Employment Committee and the Council (1).

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(1) - Communication to the Council : The reform of the organisation of work (humanisation of work) COM(76) 253 of 3/6/76.
- Communication to the Standing Committee on Employment on "Reductions of qualitative mismatches between the supply and demand for labour : guidelines for labour market policy and working conditions policy" COM(79) 193/2 of 5/4/79.
- Proposed Directive on information and the consultation of workers in enterprises exercising their activities in several Member States COM(80)423 final of 23/10/80.

9. The close consultation of the Social Partners was identified as one of the most important actions identify by the Standing Committee on Employment. The Commission have striven energetically to ensure contacts, and exchanges of experience, with the representatives of employers and employees. Opportunities for this came at the Manufacturers' Round Table, and numerous meetings at sectoral level with trade unions and with the technology experts. These meetings dealt primarily with improving knowledge and understanding the general problem, but they also considered questions of education and training, and the establishment of general principles governing the introduction of new technology at European level.

10. The Commission proposed that a European Pool of Studies and Analysis be set up. This was adopted by the Standing Committee on Employment.

The Pool has three aims:

- to assemble and evaluate existing research and national experience;

- to circulate and compare these activities and make the results available to those involved in political and scientific discussions. The Pool also provides the documentary basis for the consultation of the Social Partners;

- to orientate future studies and analyses in the field.

The work is being undertaken in co-operation with the Dublin Foundation (living and working conditions), CEDEFOP Berlin, (vocational training) and ETUI and ILO (collective agreements). After being delayed by budgetary difficulties, the conceptual phase was started in autumn 1980 using an external consultant. The operational phase, started in summer 1981, consists primarily of establishing a documentation base, annotated bibliographies, and a regular bulletin covering current issues. It is hoped to use internal Community information systems (e.g. CEDIN) for the dissemination of the established data base.

11. A number of studies have been launched by the Commission in the framework of various research and action programmes. In the newly established "new information technologies" study-programme, among other things, financial provisions were made during 1981 for the consideration of employment, education and training problems. The studies focus on the following areas:

- the identification of groups, sectors and skills affected, with particular emphasis on the problems of women, older workers and service activities (e.g. retailing), as well as the impact of socio-economic changes in the regions of the Community;

- the application of new information technologies so as to expand employment potential, particularly in small and medium-sized enterprises;

- the establishment of legislation, agreements and collective-bargaining procedures for rationalisation;

- the establishment of a comprehensive information base regarding the application of new information technologies in education and training systems with special emphasis on case studies of promising innovations in Member states, potential for the teaching and training of the handicapped).

- The work of CEDEFOP in Berlin, where several projects have been launched, focussing on decision making and management processes as well as on training requirements of new information technology, particularly the implications of CNC-machines, implications in the dairy and construction industries and for small and medium-sized enterprises.

12. In the framework of FAST, several studies are under way on the broader, long-term impact of new technologies on Society. The time-horizon is the next two decades; a wide variety of socio-economic aspects are being examined, including international division of labour, job-creation, employment in the services, transport, distribution of power and life-style.

13. The European Foundation for the Improvement of Living and Working Conditions, in Dublin, in its second rolling programme (1981-1984) continues to emphasize the theme of the effect of technological development on working conditions.

The programme is aimed at medical and physiological improvement of the work place and increased information disclosure at an early stage of technological developments. Projects under way include the extent of electronic equipment in the office, the impact of VDUs on the level of physical and mental stress, changes in shiftwork patterns in the automobile sector. Their results will contribute to the increase of information and to its dissemination to the political bodies concerned.

14. The Commission, through its programmes in ergonomics (*), has made a significant step forward in ensuring that new technologies do not entail hazards for the human operator. Questions of safety and health at work have been investigated by several studies.
It can be shown that there will be a shift from physical/ psychological/environmental problems to those relating to the strains induced in the operator by demands on his information processing and control capacities. Technological systems will therefore have to be designed to be compatible with these capacities.

The results of these studies will provide working documents for an Ad-hoc Study Group on ergonomics and the new technology, and in some cases provide guidelines for managers, engineers and designers of technological systems.

15. A further priority identified by the Standing Committe on Employment was the improvement and re-orientation of education and vocational training. As regards education, the Commission has so far concentrated on the consultation of the competent authorities in the Member States, and other interested parties, in order to assist in the development of its proposals for future activities. Several meetings were held with education experts, and with representatives of teachers' organisations in 1980 and 1981. Work is in progress on the preparation of a major conference on Education in 1982, to enable education and training policy makers to exchange experience with the social partners. EURIDYCE (The Education Information Network in the European Community) has moreover begun to assemble information working with national units in each of the Member States, on national structures to coordinate and activate work in the field of education and the new information technologies.

(*) IIIrd Programme of Ergonomics and Rehabilitation for the European Coal and Steel Industries (1975-79) and continuing in its IVth Programme of Ergonomics for the E.C.S.C. Industries (1980-84)

16. As regards qualifications and vocational training, work has been begun by the Commission and CEDEFOP. A survey of Member States' needs and provisions in the field has been prepared which deals especially with the current level of skilled manpower qualified to work (i) in the design and production of microelectronic equipment, and (ii) with the new equipment in production and services. Based on an expert report (1), an examination will be carried out in autumn 1981 so that conclusions about future skill-requirements, new career structures and profiles and the development of training systems can be drawn on the basis of reliable information.

17. The role of the Social Fund in promoting training measures to take account of the implications of new information technologies is of great concern to the Commission. Such training may be included under different ESF headings. However, a line entitled "Technical Progress" with a relatively small budget - 30 million Ecus in 1981 - is specifically reserved for training in new technologies; an increase in this amount has been requested for 1982. Indeed, appropriate financial resources will be necessary if the Fund is to play a more promotional role in this field.

3. ISSUES FOR DISCUSSION

18. The actions undertaken hitherto are both a step forward and a step towards new uncertainties. Despite intensive political and scientific discussion, the effects of technological developments are only partly known and their evaluation is frequently a matter of controversy. Technology is, among other things, a social process . It is related to current changes in social values and attitudes to work, and the emergence of new aspirations and occupations. Furthermore, the complex inter-relationships between the changes in employment, skills and education makes it more difficult to formulate unanimous responses. For the individual, the effects will be experienced over a life-time. They will be present at school, during training and re-training, but most of all in the various levels of work.

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(1) A.SORGE : Microelectronics and Vocational Education and Training, June 1981.

19. While the quantitative impact on employment remains a central concern, qualitative aspects are recognised as important, especially where the new information technologies :

- often tend to create sectoral and regional mismatches between available and required skills;

- change the nature, the content and the environment of work.

Innovations using new information technology will deeply affect the structures, content and modes of education and training. Their functions may be enhanced by the potential of new information technology while, in a longer perspective, the general function of learning itself will be affected.

3.1. Technical determinism ?

20. There is relatively broad agreement on the benefits of new information technologies, and that they should be received with an open mind by society. The conclusions of the Standing Committee on Employment underlined their key role in maintaining competitiveness and facilitating society's internal development. As for the positive effects of new technologies, the following conclusions of the Standing Committee on Employment can be cited:

- the improvement of productivity and of the effectiveness of production of already existing goods and services;

- the creation and the making available of new goods and services, including opportunities for least favoured groups.

However, the unique characteristic of new technologies, its pervasiveness and the speed with which technical improvements are made and new applications found, leads to widespread misjudgments of it and feelings of insecurity. Earlier defensive attitudes were reinforced by the extent of fundamental changes in some sectors in the early stages of the introduction of the technology. This was mistakenly seen as "inevitable". The trade unions emphasized particularly that while technology is not deterministic, the decision-making process in implementation and design of systems and the structure of jobs may be. The methods of implementation depend on :

- existing consultation procedures and types of negotiation;

- available manpower and its qualification.

21. On the one hand, new information technologies promote decentralisation, either by the setting up of smaller plants or the increase of subcontracting. This development has been reinforced by decentralised data processing which allows direct access to a central computer from different terminals, while at the same time providing control facilities for the company's headquarters. The scope for decentralisation may have an impact on industrial relations which normally are influenced by the size of both the plant and the company, the structure of the workforce and the economic position of the individual sector.

On the other hand, new information technologies cut across the board. They never affect just one department or one group of workers. In some some countries, established patterns of unions organisation have been been re-examined in order to increase the exchange of information and joint policy development.

Traditionally, trade unions have held a stronger position in sectors dominated by large production units, e.g. steel, electro-mechanical engineering, automobiles, chemicals. New information technology, however, will develop particularly in the service sector, machine-tools, electronics and the administrative part of industry. This will certainly have industrial relations consequences.

22. In several countries of the Community employees or their representatives are granted a legal right to information, consultation and participation. The works council/enterprise committee thus plays a key role in coping with technological and social changes. However, even in these cases

- acquired rights may not be sacrosanct when it comes to the introduction of new skills and organisational changes;
- such rules govern the practical problems of application rather than the choice of technologies to be introduced.

For this reason - as was shown in chapter 2.1. - so-called "technology agreements" have been negotiated in a growing number of Member States. Their main objective is that workers should at least be informed about and at best participate in, the choice of new equipment and work organisation. They cover procedures for work place changes, especially procedures for early warning, job protection, ergonomical standards, reorganisation of working time and job-redesign. In practice, however, rights on information, consultation, negotiation and recourse to external experts vary enormously between countries and sectors.

23. The issue of new technology has consolidated the process of collective bargaining in several countries, often widening its boundaries. A recent example is the 1981 agreement, between the Danish central trade union and employer bodies on the introduction of technological systems. Under this system sectoral and company level agreements must be made within the nationally agreed framework and there have been cases where this has been forced on companies and unions where agreements did not comply.

24. Some parties have called for legislation making it an obligation to reach such agreements . There have also been demands on the Commission to take action in this direction.

Two different roles may be distinguished :

- to create a climate of awareness and acceptance which can be used to stimulate negotiations within the Member States;

- to bring together the Social Partners to discuss realistic proposals and actual experiences in the terms of model agreements with a view to drawing up some sort of joint statement or best practice code.

3.2. Technological unemployment ?

25. The debate about the implications of new information technologies must be seen against the current economic background. The situation in the Community is marked by :

- high and persistent unemployment - in mid-1981 some 8.5 million people were registered as unemployed in the ten Member States;

- a gap between a continuing growth of labour productivity and slow or no growth in real GDP in most countries. The term "technological unemployment" is sometimes used to describe the present situation but this must be of relatively minor quantitative importance compared with shortfalls in growth, demographic trends and other structural shifts.

It is extremely difficult to isolate technological innovations from the organisational or other changes that generally accompany them. It is undeniable that in present labour market conditions, rationalisation acts to increase productivity and may in consequence increase unemployment. But from a company point of view, introduction of new technology improves competitivity and may enable them to retain or increase their share of the market. Further, the economic constraints arising from national and international competition should also be noted: a firm which did not introduce these technologies would risk the loss of its markets and put existing jobs at risk. Consequently, there is no escaping from the introduction of the new technologies in our societies.

26. The full effects of new information technologies are unlikely to be felt even in the medium term. Various methodologies have been used to investigate their quantitative effects. Much has been said about potential labour displacement, job-creation prospects and the time-lag between them, but there has been much less on the internal changes at the level of the firm. Since the discussion in the Standing Employment Committee hardly any new forecasts of the effects on employment have appeared. Current research is increasingly orientated towards case studies and experiences of collective bargaining. The conclusion of the Committee, that there are as yet no reliable forecasts of the quantitative impact of micro-electronics on the level of employment in the coming years, remains valid as a provisional resumé of the situation. Useful results in this field are to be expected in the context of the Commission's FAST programme, in particular, as regards the job-creation potential of some key information technologies and their impact on the future employment patterns in the service industries. European-based comparative research can help in understanding (i) what happened in the past decade and (ii) in which sectors the comparative advantages of new technology appear to be, and/or are expected to be, the greatest.

27. Experience to date shows that sudden, penetrating inroads into employment have been caused by substitution of traditional products or production processes by microelectronics. Well known examples include cash registers and scales, where an electronic product, produced in a highly automated way, has been substituted for a mechanical one. Such developments seem now to be slowing down as goods, services and processes are increasingly modified and functionally extended and above all made possible for the first time. Different sectors of the economy are being and will be affected at varying speeds, so that changes in the labour-force are likely to occur gradually and continuously rather than abruptly. However, at the level of the firm changes are often dramatic and may involve movements of workers between firms.

28. So far short and medium-term employment effects have not been sufficiently distinguished. Political and economic counter-currents such as workers' resistance or traditional attitudes of employers in small and medium- size entreprises can influence these effects. Long term studies should be used to verify the hope that the information technologies are potentially job creating through the many applications which will arise in both industry and services.

29. Issues linked to the geographic displacement effects have also not been adequately investigated, at intra- European and regional level. Further research is being carried out on the possible contribution that the new information technologies can make in older industrial regions and "peripheral" regions of the Community. For certain regions the new information technologies will much more than for others,

be a "new history of innovation" disclosing the economic and technological obsolescence of their production methods, the lack of qualified employment and the inadequacy of training opportunities. For this reason, short and medium term effects will have a determining influence on future employment in the most underdeveloped regions. Yet technological innovations can also have positive effects in these regions, insofar as appropriate economic decisions are taken and put into effect, for example through the reorganisation of local services or encouragement of new economic activities.

3.3. Changes in skills

30. Until now insufficient information has been available about job changes within firms and about the growth of new skill requirements. This mobility of occupations and skills is among the most important requirements of new information technologies. For example, internal job changes caused by technological innovations will accelerate the general trend towards the growth of employment in work preparation, research and distribution as against reductions in assembly and production. A trade union policy towards companies and the setting up of a forward looking manpower policy at enterprise and local level would allow greater account to be taken of these internal changes and their implications for work organisation and qualification.

31. Experience to date illustrates different trends in connection with which time-horizon and level of analysis (economic in general, enterprise, individual worker) have to be borne in mind. For example, deskilling is much easier to identify in a particular company than at a sectoral level where, at a given moment, different phases of up- and downgrading in skill-structure play a part. Different effects will also come about in industry (numerical controls, robotics) and the services (word processing). Office automation will bring about a completely new structure of organisation and job content. Overall, there will be substantial changes in jobs and qualifications in this area, which provides a high proportion of employment for women. Women are indeed doubly affected by the introduction of new information technologies : on the one hand there will be substantial rationalisation in office employment which has traditionally been the sector of women; on the other, many training programmes require special qualifications which women had been unable to obtain either during their previous career or in their basic training.