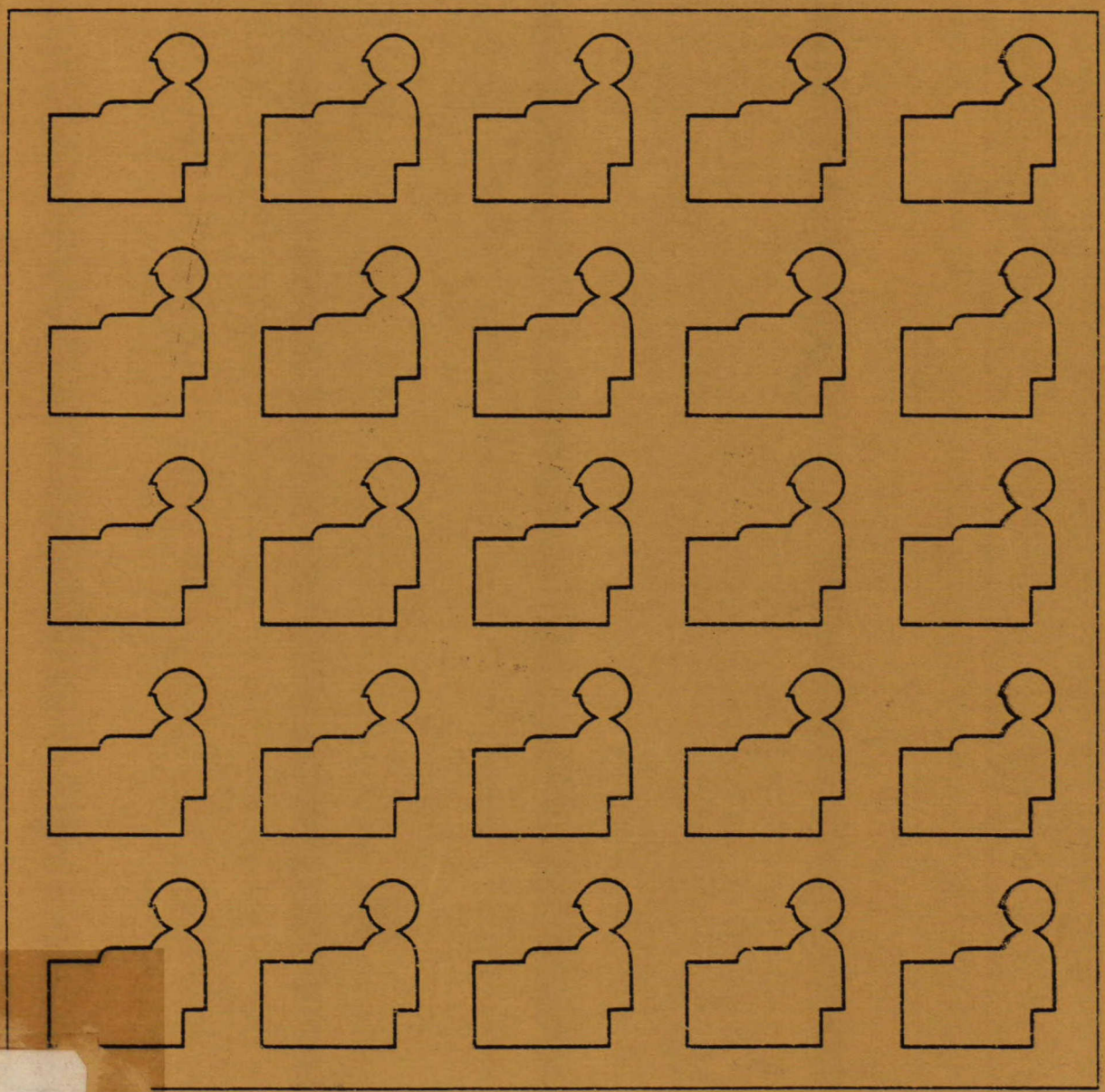
OFFICE COMMUNICATIONS SYSTEMS PROGRAM

PROGRAMME DE LA BUREAUTIQUE

THE HUMAN AND SOCIAL ISSUES OF OFFICE COMMUNICATIONS TECHNOLOGY

Report of the Human and Social Impact Committee on Office Automation to the Users' Group

March 3, 1983



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THE HUMAN AND SOCIAL ISSUES OF OFFICE

COMMUNICATIONS TECHNOLOGY

REPORT

From: The Human and Social Impact Committee on Office Automation

To: The User's Group, Office Communications Systems Program,
Department of Communications

March 3, 1983

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Preface

The Human and Social Impact of Office Automation Committee was constituted by the Users' Group in September, 1981. The Terms of Reference prepared by the Committee were approved by the Users' Group in December, 1981. (See Appendix B)

The Committee's first task, at the request of the Users' Group, was to prepare a report which would review the human and social impact of office automation and make recommendations to the Users' Group about office automation in the federal public service. This report is the Committee's response to that request.

Membership on the Committee has changed over the last 18 months during preparation of this report. (See page v for a list of Departments that have sent representatives) Although the current members have participated in a complete review of recommendations, most of them did not participate in writing the report and thus felt it would be inappropriate to attach their names to the report.

This is a majority report; on a number of points the Committee failed to reach a consensus. The position expressed by the Personnel Policy Branch of the Treasury Board, which was presented to the Users' Group on January 25, 1983 along with an earlier version of this report, was considered by the Committee in three meetings in February and March, 1983. Also considered were written comments presented by the Status of Women. These discussions clarified that there were differences in overall point of view or approach toward the report and its purpose that can be summarized as follows:

1) TB thought that the Report could be construed as being a public and official document of the Government of Canada and could be taken by the public as outlining official views. For that reason, TB thought that positive aspects of office automation should be emphasized and the potential problems mentioned only when there was sufficient empirical evidence to verify that problems occur.

The majority of the Committee thought that the report was an internal government document directed to the Users' Group and that it was therefore appropriate to draw to the attention of the Users' Group the potential human and social issues and concerns that are being discussed in the open literature, whether or not they have been empirically confirmed.

2) TB thought that the report should take the point of view of the employer or at least review the policies that are in place to deal with the issues raised. The majority of the Committee thought that it was legitimate to present the point of view of the individual employee and that the Committee does not have adequate time to complete a thorough review of TB policies and the extent to which they will be able to deal with the changes created by office automation.

Having clarified these differences in approach, the Committee agreed to review all of the recommendations and to take the majority view on each. The recommendations contained here were revised during 10 hours of discussion in three meetings in February and March.

The report has taken 18 months to complete, partly because it is a complex and difficult subject to review and partly because many of the issues are controversial. The complexity is a result of the state of the field. When the Committee began its study, there were no reviews which could provide classifications and coverage of the issues. There is a large amount of written material, most of which contains opinions, concerns and projections. There are few established facts. The issues are controversial because there is no agreement on the nature of the potential impact and because proposed solutions have serious implications for employees and employers. To deal with this difficult study, the committee adopted a strategy which consisted of four steps:

1. Describe and classify all of the concerns that have been expressed about the human and social impact of office automation in both the academic literature and the public media.

2. Evaluate whether the quality of empirical evidence about each issue warranted firm conclusions and policy recommendations or whether further clarification was required.

3. Review federal government policies currently in place that appeared to be revelant to the issues and to evaluate whether these policies will be adequate to deal with the issues.

4. Make recommendations.

The report has strengths. After review by many people, we are quite confident that the report has covered the issues that have been expressed as concerns. We also feel that the report provides general guidance and philosophical direction to the federal government about the human and social impact of office automation. The report points out where studies should be conducted and where policy should be reviewed or prepared to deal with the likely emerging changes in the work place.

However, the report also has limitations. The review of empirical evidence is based on secondary sources and does not constitute a scientific review of literature which was outside the time available to members for committee work. The review of policies in the federal government and their appropriateness for dealing with the issues raised was similarly constrained by time. Recommendations could be more concretely stated only if time were available to complete further empirical and policy study. We therefore present this report as a carefully considered review of the state of our knowledge at this time.

Dorothy Phillips
Chair

March 3, 1983

Departments Represented on the
Human and Social Impact of Office Automation
Committee

Bureau of Management Consulting
Communications
Communications (Chair)
Customs and Excise
Employment and Immigration
External Affairs
Labour
Ministry of State for Social Development
National Defence
Public Service Alliance
Public Works
Public Service Commission
Royal Canadian Mounted Police
Secretary of State
Statistics Canada
Status of Women
Treasury Board
Transport

SUMMARY OF RECOMMENDATIONS

GENERAL PRINCIPLES: Some recommendations are general principles or statements of philosophy which the Committee recommends to guide the implementation of office automation.

FIELD TRIALS:

SECTION

RECOMMENDATION 31: The field trials being designed under the Office Communications Systems Program in the Federal Government should be used as testing grounds to investigate the human and social issues of office automation, to investigate implementation strategies and to recommend policies for the federal public service based on these investigations. 5.0

RECOMMENDATION 30: Studies undertaken by the federal government arising from this report on issues related to office automation should have management and union representation on the planning and implementation. 4.2

SOCIETAL LEVEL:

RECOMMENDATION 1: Guidelines should be established to guide the process of office automation in all departments and agencies of the Government of Canada. The guidelines should conform to those recently adopted by the Cabinet for government assistance to the development and application of microelectronics and information technologies. Specifically this would require that 3.1.5

1) policies and programs be directed towards early participation of employees, identification of

problems and incorporation of human resource planning into the process of adopting new technologies.

2) particular attention be paid to the likely impact of the technology on women, especially in clerical jobs.

3) internal federal government education and training efforts recognize the need for skilled human resources in micro-electronic technologies. In particular, barriers to the participation and advancement of women in micro-electronics related work should be identified and removed through appropriate education and training expenditures. encouraged

ORGANIZATIONAL LEVEL:

SECTION

RECOMMENDATION 5: In choosing office automation equipment, management should be encouraged to opt for systems that encourage flexibility and enriched careers, and to avoid creating jobs that are associated with machines only. 3.2.4

RECOMMENDATION 10: Any work at home arrangements should be flexible and take into consideration the needs of employees as well as managers. 3.2.6.1

INDIVIDUAL LEVEL:

RECOMMENDATION 17: The federal government should ensure a continuous monitoring of physical effects of office automation on employees and provide, in guidelines on the implementation of office systems, indications as to how to handle them. 3.3.1.3

SECTION

RECOMMENDATION 24: Special measures should be taken to ensure that special interest groups such as handicapped, francophone, native, women are (not disproportionately affected adversely by office automation and that they are) given opportunities to benefit from ~~it.~~ O. A. — 3.3.4

MANAGING THE PROCESS OF CHANGE:

RECOMMENDATION 25: In their human resource planning prior to the introduction of office technology, departments should take into consideration the impact of the introduction of technology on career progression and other human and social issues to minimize any negative impacts on employees and on particular occupational groups. — 4.1

POLICY REVIEWS: were recommended where federal government policy exists but it is not immediately clear whether existing policies will be adequate to deal with the changes.

INDIVIDUAL LEVEL:

RECOMMENDATION 13: The Public Service Commission should ensure, through its policies, that pregnant employees not wishing to work on VDTs, are granted priority for appointment. — 3.3.1.1

RECOMMENDATION 15: Treasury Board Guidelines in office space should be reviewed to incorporate space for office automation equipment as new equipment is provided for employees at all levels. — 3.3.1.3

RECOMMENDATION 16: Employees who will be using office automation equipment should be consulted on issues related to office organization and layout, and work station design. — 3.3.1.3

SECTION

RECOMMENDATION 19: Treasury Board should review occupational health & safety standards to determine whether they are adequate and appropriate for the automated office. These standards should be revised if necessary and applied. 3.3.1.5

RECOMMENDATION 22: The Treasury Board should review its administrative policies relating to privacy of individual in light of changing technology and office automation. Such a review should recognize the validity of an individual's privacy needs as an important factor in the relative improvement or deterioration of the conditions of work. 3.3.2.4

MANAGING THE PROCESS OF CHANGE:

RECOMMENDATION 26: Representatives of employees at all levels should participate in the planning stages from the beginning of an office automation project. 4.2

POLICY DEVELOPMENT: was recommended where, as far as the Committee members were aware, no policies existed and it is clear that they will be needed.

ORGANIZATIONAL LEVEL:

RECOMMENDATION 4: Because there may be hidden costs to the centralization of word processing (e.g. turnover) Treasury Board should bring these hidden costs to the attention of management personnel responsible for decision making about centralization or decentralization. 3.2.3

SECTION

RECOMMENDATION 6: Unit managers should be encouraged to provide opportunities for employee initiative and job enrichment that avoid specialized, single function jobs. This could be supported by government procurement policies that encourage the development of flexible, multi-function office automation systems. 3.2.4

RECOMMENDATION 11: Public Service policies should be developed in consultation with employees to allow experimentation and implementation of the new opportunities offered by technology for handicapped workers, flex-time and flex-place. These options should be considered as part of the required human resource planning. 3.2.6.1

INDIVIDUAL LEVEL:

RECOMMENDATION 18: In procuring equipment for office automation of the Public Service, serious consideration should be given to making human factors measures part of the functional specifications of design. 3.3.1.4

RECOMMENDATION 21: Employees at all levels should be consulted and should be allowed to participate in decisions about the type of data collected and how it is used to monitor their productivity and assess their performance. 3.3.2.3

TRAINING: These recommendations dealing with training can probably be implemented under existing policies and represent new content for training.

ORGANIZATIONAL LEVEL:

SECTION

RECOMMENDATION 7: Training programs should include modules that would attempt to develop conceptual skills common to office automation systems and that will assist people to change, adapt and transfer their skills as the technology changes. 3.2.5

RECOMMENDATION 8: The Staff Training Council should identify service-wide requirements for both present and projected training needs arising from office automation. 3.2.5.2

INDIVIDUAL LEVEL:

RECOMMENDATION 20: Line managers should be educated in the health, safety and ergonomic issues related to office automation and in the policy options available to managers so that the manager can consider employees' needs in planning for change. Employees should be given similar education. 3.3.1.5

MANAGING THE PROCESS OF CHANGE:

RECOMMENDATION 27: The federal government should provide briefings for decision makers prior to their design of office automation systems. These briefings should include consideration of the human and social issues. 4.2

RECOMMENDATION 28: Orientation briefings should be given for all employees directly affected at all levels about the issues and implications of office automation at the time the decision to introduce office automation is made. 4.2

SECTION

RECOMMENDATION 29: Treasury Board in conjunction with the Public Service Commission should consider establishing a program to provide education on human and social factors in office automation. 4.2

STUDIES were recommended where there was good reason to believe that change would occur but the nature and degree of impact was not yet known.

SOCIETAL LEVEL:

RECOMMENDATION 2: The provision of new information based government services using microelectronics technology should be actively explored. 3.1.5

ORGANIZATIONAL LEVEL:

RECOMMENDATION 3: A study should be conducted of the effect of office automation on hierarchical studies and work patterns of all levels of the organization. The study should include 1) reporting relationships, 2) functions, 3) communication patterns, 4) the manager's role 5) the impact on clarification of jobs. 3.2.1

RECOMMENDATION 9: Treasury Board should undertake a thorough study of the implications of alternative work site arrangements from both the employer and employee point of view and develop a policy with guidelines for departments. 3.2.6.1

INDIVIDUAL LEVEL:

	SECTION
RECOMMENDATION 12: Studies into the potential effects of radiation from visual display terminals should be conducted on an ongoing basis by an independent research organization. The federal government should continue to monitor on-going studies on potential radiation effects.	3.3.1.1
RECOMMENDATION 14: A study should be undertaken of the empirical evidence relating to stress and stress-related disorders that might be expected to arise from office automation and any evidence related to how to determine and to control the optimal level of stimulation in the automated office environment.	3.3.1.2
RECOMMENDATION 23: A study should be conducted of the effect of office automation on social communications among workers to include the potential for social isolation and alienation and the potential for new social contacts and new types of social interactions for workers.	3.3.3

HEW have another report ✓

1. INTRODUCTION

This report on the human and social impact of office automation in the federal public service focuses on the federal government as employer and on the situation of the individual public servant. As the largest single employer in Canada, and as a large processor of written information, the federal government will be subject to whatever human and social problems or changes arise, as information technology is used increasingly to enhance the processing and communication of text.

The report takes the point of view of the employee as an individual. It assumes that employees at all levels, from senior management to clerical, will be affected by the introduction of office technology. The report attempts to point out both benefits and problems from the employees' point of view. If more paper is devoted to expected problems than to benefits, it is because there appear to be many problems and much has been written about them. Most of the expected benefits are thought to be related to increased productivity and new job opportunities. The issue of productivity is the concern of another committee and will not be dealt with extensively here. If the concerns of employees can be addressed as office technology is introduced, it is possible that there will indeed be benefits to the employees' quality of working life, for example, new career opportunities, more fulfilling work, participation in decision-making.

This report begins with a focus on the quality of working life movement and its definitions of what employees want from work, quite apart from office technology. The reason for this initial focus is that it sets the context into which office technology is being introduced. It also provides a set of goals to strive for as changes are made in work organization with the introduction of office technology.

The report then considers the problems or issues that have been of concern to people, as office technology is introduced. For each issue there is an

attempt to review the quality of empirical evidence and to report on federal government policies which relate to the issue. Recommendations are made for further research where the status of empirical work leaves conclusions unclear. Policy recommendations are made where existing policies appear to be lacking or where they openly conflict with the expected changes. In some cases, new policy initiatives are recommended.

The expected changes described fall into three levels of analysis: societal, organizational, and individual/small group. At the societal level is the expectation of changes in employment patterns with the potential for increased unemployment. While such changes will obviously affect individuals, most of the analyses have been at the broader societal level or have attempted to exrapolate from the organizational level to the societal. In this report, the societal level is equated with public service-wide effects and policies.

At the organizational level, in this report referring to the departmental level, are a set of expectations for change in the structure of work. Again, these will influence individuals but can best be understood, and the change directed, from the level of the organization. At the level of the individual/small group are the changes that will affect the daily working life of the individual. These can often be addressed by the unit manager in consultation with employees, if they have the support of organizational level policies.

The report then considers some means of managing the process of change as office technology is introduced. Finally, assessment of the human and social impact of office automation during field trials in the public service is considered.

2. THE CONTEXT: Working Life in the 80's

Office Communications technology is being introduced in the 80's into a workplace and a society that has particular problems, goals and desires. The

context includes the influence of two approaches to assessing and implementing change in work organization which are particularly relevant when technology is introduced.

These two approaches, Quality of Working Life and Socio-technology, have been growing in influence in North America and Europe since the 1920's. Both approaches grew out of work that began with studies by Elton Mayo, in 1920's. The conclusion of his work was that when employees have a sense of involvement in the work process, job satisfaction and positive motivation increase. The Tavistock Institute of Human Relations in London, England, looked beyond the individual employee to the organization of the work itself in an effort to create more satisfying work and increased organizational effectiveness. During the late 1940's and 1950's, members of the institute began to recognize the influence of technology on both the nature of jobs and the social organization of the workplace. Tavistock researchers noted that engineers designed technical systems with little understanding of the human of social systems that would result from them. The group developed the concept of an organization as a socio-technical system. Design, then, should be a process of 'joint optimization' of the social and technical systems: an effective organization is one that is designed to meet the needs of employees as well as the requirements of the technical system.

The Quality of Working Life movement, which grew out of this work, focuses on the individual worker. QWL is an organizational philosophy based on humanistic values toward work and aimed at improving the effectiveness of the organization and the job satisfaction of employees at all levels. This is achieved jointly by management and other employees and their representatives in the organization. (Trist, 1981)

QWL has led to clear definition of what employees want from their jobs. Table 1 lists both extrinsic and intrinsic job properties (Trist, 1981) which define what constitutes a 'good' quality of working life for employees.

Table 1

What Employees Want from their Jobs

Extrinsic Requirements

- fair and adequate pay
- job security
- benefits
- safety
- health
- due process
- conditions of employment considered beneficial
- socio-economic benefits

Intrinsic Requirements

- variety and challenge
- continuous learning
- discretion and autonomy
- recognition and support
- desirable future
- meaningful social contribution
- psycho-social benefits

(from Trist 1981)

Socio-technology focuses attention on the options available in the design of a social system that will utilize a particular technology. Socio-technical system design can be viewed as a tool used to achieve QWL objectives. The key principle of this approach is that work systems should be designed so that the best match is obtained between the technical system (technology) and the social systems (people), thus achieving the "joint optimization of the two systems". (from Trist, 1981)

Organizations and the people in them are increasingly shifting their way of viewing work life. Traditionally, organizations sought efficiency by breaking jobs down into specialized and repetitive functions. This minimized worker responsibility and decision making, and minimized the requirements for employee training and development. Direction and creative contributions came from managers and supervisors. In contrast, QWL techniques emphasize employee participation with increased responsibility and decision-making and direction from both management and staff. Table 2 contrasts key features of the old organizational paradigm with those of the new paradigm of QWL concepts. The essential component of the new paradigm is the opportunity for individuals or task groups at any level of the organization to influence their working environments by participating in decisions on matters that affect them.

Table 2

Shift In The Organizational Paradigm

Old Paradigm	**New Paradigm**
The Technological imperative	Joint optimization
Man as an extension of the machine	Man as a complementary to the machine
Man as an expendable spare part	Man as a resource to be developed
Maximum task breakdwon, simple narrow skills	Optimum task grouping, multiple broad skills
External controls (supervisors, specialist staffs, procedures)	Internal controls (self-regulating subsystems)

Tall organization chart, autocratic style	Flat organization chart, participative style
Competition, gamesmanship	Collaboration, collegiality
Organization's purposes only	Members' and society's purposes only
Alienation	Commitment
Low risk-taking	Innovation

Source: Trist (1981), p. 42.

3. EXPECTED CHANGES WITH OFFICE AUTOMATION: Issues, Problems, Worries.

Against this background of increasing concern with the quality of working life, the introduction of office technology in the federal government is expected to engender substantial changes in the workplace. Description of these changes will be focused on three levels of analysis, the societal level (in the context of this report, the entire public service), the organizational level (departments, agencies), and on the individual or small working group level (work unit). Although the levels are not independent, the major focus of each provides a perspective on the issue which appears to point to the best level of solution. At the societal level, solutions must be large scale; at the organizational level, problems may be resolved by policies within the organization; at the individual/small group level, strategies of the middle manager, with input from the work group, may alleviate concerns although some support at the organizational level will be needed to provide the manager and work group with policy tools to address the problems.

3.1 Public Service Wide Changes Expected: Societal Level Changes and Issues

3.1.1 Employment levels

Changes in the employment structure of the economy are widely expected as a result of office automation. One major concern expressed by the public is that the level of unemployment will increase. While this effect is widely predicted, there is, at present, no conclusive evidence that total employment will decrease, or that employment will increase, as a result of office automation. It is difficult to obtain reliable evidence for such effects because office systems have not been in place long enough; other changes in the economy at the same time also affect the employment level; and the technology also creates new jobs.

In addition, the relationship between technological change and labour market development has not been well understood in the past. This incomplete understanding "provides a shaky foundation for venturing to look at possible relationships between them in the future". (Canecs Report, 1979) Some levelling off of the overall rate of persons entering the labour force is expected in the next decade and a half and the overall unemployment rate is expected to decrease slowly along with a net increase in persons employed. However, it is not clear that such predictions have taken adequate account of the potential changes to be brought by technology in aggregate levels of employment.

The effect of office automation on aggregate levels of employment in the public service is hard to predict. While the technology may increase the level of productivity of the employees required to provide a given level of service, thus reducing the number of jobs, it is also possible that new services will be demanded of the government. New or expanded information based services, which would previously have been prohibitively expensive may now be possible. This expected increase in the level of service with the same number of employees, or

"jobless economic growth" is also of concern to employees who feel that they should benefit from the increasing productivity of their labour.

3.1.2 Job displacement

Concern is also expressed about displacement of workers as some jobs become obsolete because of technological change. While new jobs will be created, it seems obvious that it will not be possible to directly transfer displaced employees to new positions because there will be a large training differential in the two types of jobs. The issue of training will be addressed later in the report. Here it is important to note that major dislocations might be expected in certain jobs and among certain groups. A useful distinction is made by Menzies (1981) between "information workers", who handle, process, store and retrieve information and "knowledge workers" who apply information and have much greater scope for exercising initiative. The functions performed by information workers, most of whom are women, are generally the first to be automated as micro-technology is introduced into the office.

3.1.3 Women and employment

The concerns of women as office automation is introduced are partially with the level of employment. Throughout the economy, the employment of women is highly concentrated in those office functions which are the first targets of automation. Since, according to the Dodge and Allmand Task Forces, most of the labour force growth in the 1980's will be from adult women, there is clearly a danger of higher unemployment among women if the current pattern of female employment does not change. Unless preventive measures are begun at once, the result could be one million unemployed women by 1990 (Menzies, 1981). Given the importance of the federal government as an employer of women, internal policies relating to office automation may significantly affect future female unemployment rates.

3.1.4 Public Service Practices

Within the Public Service, the creation of centralized word-processing pools has been the main manifestation to date of micro-processor-based office automation. These existing word-processing operations represent only a partial utilization of the potential micro-processing technology, since they are being used for the transcribing and editing of only a fraction of typed documents. Most of the storing and retrieval of documents continues to be carried out on a manual, paper-based system. The expected large scale shift toward electronic storage and retrieval will mean a sharp reduction in the production of paper documents and may significantly reduce employment of both typists and clerks and/or may radically alter the tasks they perform. The major effects on labour demands of even this earliest phase of office automation technology development have yet to be felt in the Public Service.

Due to attrition, the Public Service has been able to avoid layoffs during the introduction of word processing. If the rate of diffusion of office automation increases and the range of functions affected also increases, it may no longer be possible to balance decreased demand against attrition.

There is room for new and improved services with the new technology and some of these are already under development such as automated job search and career counselling and the provision of information on government services.

3.1.5 Recommendations Regarding Employment Levels

RECOMMENDATION 1: Guidelines should be established in the very near future to guide the implementation of office automation in all departments and agencies of the Government of Canada. These guidelines should conform to those adopted by the Cabinet for government assistance to the development and application of micro-electronics and information technologies. Specifically this would require that

1) policies and programs be directed towards early participation of employees, identification of problems and incorporation of human resource planning into the process of adopting new technologies.

2) particular attention be paid to the likely impact of the technology on women, especially in clerical jobs.

3) internal federal government education and training efforts recognize the need for skilled human resources in micro-electronic technologies. In particular, barriers to the participation and advancement of women in micro-electronics related work should be identified and removed through appropriate education and training expenditures.

RECOMMENDATION 2: The provision of new information based government services using micro-electronics technology should be actively explored.

3.2 Organizational Level Changes Expected (Departments and Agencies)

The human and social impact of office communications systems technology will depend on the particular form of technology chosen and on the way it is integrated into government operations. There is a large element of choice involved in implementing the technology and in the organization of work using the technology. It is the choices made by organizations that will shape the impact of the technology. At the organizational level, these choices are expected to lead to changes which may present problems for employees, especially if the changes are not anticipated.

3.2.1 Hierarchical Changes and the Manager's Role

Changes are expected in the way work is organized. For example, the hierarchy may become flatter with each manager handling more subordinates. Although this effect is commonly expected, there is no evidence yet that it

actually has taken place where technology has been introduced. The new technology will make it possible to have different types of organizations and hierarchies if the flexibility of the technology is used to advantage.

The manager's role is expected to change, not only in the number of employees he or she supervises but also in the automation of his or her own job. Several organizations are now stating that real productivity gains are to be realized by automation of the manager's tasks and not by clerical automation alone. Already in some companies, managers are being provided with electronic services for traditional functions such as attending meetings to make decisions. In addition, sophisticated electronic decision support tools, not previously available, are providing more knowledge of company operations quickly and with flexibility. These changes will require additional training for managers who will have to process more information but who may be able to do so in shorter time.

RECOMMENDATION 3: A study should be conducted of the effect of office automation on hierarchical structures and work patterns at all levels of the organization. The study should include 1) reporting relationships, 2) functions, 3) communication patterns, 4) manager's role, 5) the impact on classification of jobs.

3.2.2 Job Classification

Changes in the tasks performed by those working in automated environments are requiring changes in job classification. Job descriptions for clerical jobs fail to recognize the skills required in using the technology. In addition, because some tasks are performed more efficiently, time is available to take on other tasks. Probably because the manager is now able to complete more work, the secretary is not short of the additional tasks required to fill the time. In some cases, a redistribution of tasks between employees is occasioned by new technology. Job classification systems in the public service must recognize these changes in order to rpovide adequate remuneration, otherwise employees will take their skills to the industrial sector where they will also be in demand. (See recommendation 3)

3.2.3 Centralized or Decentralized Organizational Structures

So far, the organizational structures adopted to deal with office automation have tended to produce centralized word-processing pools where the work of the operator is confined to word-processing. Although remuneration is often higher than for typists, these jobs appear to lead to some dissatisfaction because of the limitations imposed on the development of additional skills which could enhance alternate employment opportunities. A recent survey of word-processor operators in the Public Service (Manchee, 1982) concluded that overall job satisfaction tended to decrease as unit size increased. As well as a concern about mobility, employees in larger units reported a lack of privacy, insufficient noise protection and a higher incidence of stress than employees in smaller units. There is also the potential that if voice operated entry into word-processing becomes a reality, this group of word-processors will find their skills obsolete. Again, this group is largely women.

Within an organization, this problem could be alleviated by making the word-processing operation part of the job of most secretaries and administrative assistants. Even managers and professionals may wish to do much of their own word-processing in the future. Most university graduates now are familiar with computers and many of those already in the lower management level of government could use a computer terminal to perform many functions.

RECOMMENDATION 4: Because there may be hidden costs to the centralization of word-processing (eg. turnover), Treasury Board should bring these hidden costs to the attention of management personnel responsible for decision making about centralization or decentralization.

3.2.4 Bridging the skills gap

There is fear that new technology will create a widening skills gap between the upper and lower levels of organizational hierarchies. Menzies

(1981) describes a trend in that direction as a result of office automation. (See also Report of the Task Force on microelectronics) Effectively the widening gap can shut clerical workers off from upward mobility. Again, because most clerical workers are women, the effect on this group is disproportional. It will be a challenge to meet this problem in an environment where new technology requires additional skill, often obtainable only by higher education. The public service will need to consider some type of career path design for employees who want to move from clerical positions and other lower levels of the organization. Some ideas are considered below regarding creating flexibility in jobs.

RECOMMENDATION 5: In choosing office automation equipment, management should be encouraged to opt for systems that encourage flexibility and enriched careers, and to avoid creating jobs that are associated with machines only.

Much could be done to enrich jobs by making opportunities for employees to learn a variety of tasks, to take initiative in some tasks. For example, one corporation encouraged employees to explore the potential of their advanced multi-functional office automation system. Considerable initiative was demonstrated by their staff, including secretaries, who began to develop programming skills. (Menzies, 1981). Such job enrichment programs are likely to increase job satisfaction and make employees better prepared to face changes in their jobs as automation proceeds.

RECOMMENDATION 6: Unit managers should be encouraged to provide opportunities for employee initiative and job enrichment in order to avoid specialized, single function jobs. This could be supported by government procurement policies which encourage the development of flexible, multi-function office automation systems.

3.2.5 Training and Education

Changes in office tasks and in organizational roles will require training in the use of the new machines and in the new roles. Five types of training

which should be included in office automation projects have been outlined: (BMC, 1982) 1) orientation, for both managers and employees; 2) technical training for those who will be operating the new equipment; 3)managerial training to ensure that the new equipment is used effectively; 4) redeployment training to aid employees who move to new jobs as office tasks change with automation, and, finally, 5) a continuing training program to promote continued effective use of the automated system. (1)

As long as automated office systems are new and relatively unknown, orientation and managerial training will be particularly important. (Some of the recommendations in Section 4, Introduction Strategies, are relevant to this issue as well).

Several of the issues addressed elsewhere in the report could be redressed by effective training policies. The effect of the widening skills gap between those in lower level positions and the professional, managerial and technical levels (see Section 3.2.4) could be partly alleviated by programs of educational leave. The strategy of providing flexibility in jobs in order to leave employees able to change and adapt and take advantage of new opportunities could be enhanced by effective training programs.

1. Courses presented by the Office Systems Center for the United States Government might serve as useful models for the development of managerial level training programs. Seminars and conferences running from one half a day up to three days cover topics such as "Evaluating your office automation needs", "The people factors in implementing office automation", and "Electronic mail, its technology and application". This information may be obtained from the "Office Systems Center FY 1982 Catalogue", United States Office of Personnel Management, Workforce Effectiveness and Development.

RECOMMENDATION 7: Training programs should include modules that would attempt to develop conceptual skills common to office automation systems and that would assist people to adapt and transfer their skills as technology changes.

3.2.5.1 Guidelines for Developing Effective Training

Some guidelines for making training more effective can be drawn from experience with the introduction of computers and other technological changes:

1) training should be an integral part of the office automation project from the very first planning stage. A human resource plan, outlining anticipated personnel resource requirements, displacement or retraining of existing staff and probable needs for additional recruitment could be invaluable for the smooth implementation of new techniques.

2) early planning stages should involve wide consultation with employees (including managers), as well as the systems analysts and/or equipment vendors. The consultation process in itself could serve as one element of the orientation training.(see Section 4 regarding introduction strategies)

3) the training of equipment operators should be considered part of any purchase. Training expectations should, therefore, be included in the specifications for offers to tender for equipment. However, the brief sessions offered by the vendor should be considered only the starting point in an ongoing training program for operators.

4) Productivity gains should be expected to materialize gradually as operators and managers learn to use the new tools effectively.

3.2.5.2 Responsibility for Training in the Public Service

The Treasury Board is responsible for establishing training policy for the public service, for setting the terms and conditions under which training is provided, and for monitoring compliance. Departments and agencies have primary responsibility for identifying employee training needs, for developing and conducting programs to satisfy these needs, and for evaluating the results of training. The Public Service Commission is responsible for assisting departments in providing training, in particular those training programs which can be provided most effectively and economically on a central basis.

Treasury Board conducts an annual review of all training in the public service and reports the results in the Annual Training Report. The information contained in this report is used to monitor the implementation of training and other personnel management policies and as the basis for setting training priorities.

The TB Secretariat is presently reviewing and revising the framework of policy and guidelines for training in the public service to ensure that employees who require training receive it and that the training is provided in an effective and efficient manner. The Treasury Board approved a new general policy on training on June 26, 1980. Policies on specific training matters are being prepared, eg. educational leave and apprenticeship training, orientation training for managers at all levels.

The TBS has approved the establishment of a Staff Training Council to which it has delegated authority to recommend training policies and priorities; determine public service training needs; manage training programs through a series of specialized training boards (Management Training Board; Professional and Technical Training Board, Special Needs Training Board), establish policies for the certification of trainers and instructors; and coordinate the general staff training programs of the government.

This structure of organization seems adequate to meet the training needs for office automation. At present there appears to be a requirement for public service-wide policies regarding training relevant to office automation.

RECOMMENDATION 8: The Staff Training Council should identify service-wide requirements for both present and projected training needs arising from office automation.

3.2.6 Alternative Work Sites

One of the many aspects of new office organizations arising from automation is the possibility of work being performed at home rather than in conventional offices. The "electronic cottage", as Toffler called it (1980), may well be one form of the office of the future. This raises the issue for employers of the impact of such a physically decentralized work place on organizational effectiveness. This issue will not be addressed here since this report focuses on the point of view of the employee. For employees, the major issue is whether work at home increases or decreases employment opportunities and the quality of working life.

Work at home has been described as beneficial to groups such as women with young children. The employment barriers currently facing this group include the lack of adequate and affordable child care, and the rigidity of work scheduling, both of which limit the ability of parents to combine work and family roles. As women are still assigned the primary responsibility of maintaining the family unit, these factors place major constraints on their labour force participation. Work at home may thus provide this group with the possibility of employment, but it remains a major question whether this is an appropriate long term solution to the inadequacy of child care arrangements and the inability of both parents to combine family and work responsibilities. Similarly, handicapped persons face employment barriers because workplaces and transportation systems are not designed to accommodate them.

The question here again is whether it is appropriate to shift policy emphasis away from enabling full and equal participation in the work force to developing special and segregated work environments. For both women with pre-school children and for the handicapped, the development of work at home arrangements may result in a narrowing of the number of employment opportunities if it results in a decreased emphasis on accommodating work places to the needs of families and persons with physical handicaps.

Work at home programs offer some specific advantages: for the employer, reduced office space requirements, overhead and fringe benefit costs; for the employees, less supervision, lower work related expenses, and increased flexibility.

However, considerable concern has been expressed about the conditions of employment for those who choose to work at home. For example, there might be limitations in development and promotion, and limitations in social contact among employees. Other issues to be considered would be protection of employees with respect to job security, worker's compensation, means by which employment is monitored (piecework vs. salary), employment conditions including vacations, training, and recognition in the remuneration that the overhead of office space is supported by the employee.

There is little information available on work at home arrangements actually in place. One company, Control Data Corporation, introduced an alternative work site experiment aimed at women in the home and homebound handicapped people. The rationale given by CDC for encouraging other companies to follow its lead was based on benefits to the employer such as savings in office space and energy costs and tapping of the homebound labour force. (Manning 1981). There was little discussion of benefits to employees.

3.2.6.1 Public Service Policies Relevant to Alternative Work Sites

The intent of several Public Service policies adopted in recent years (eg maternity/paternity/parental leave, part-time work, flexible hours) has been to

recognize and support the need of parents to combine work and home responsibilities without being penalized in the workplace (ie. through lost benefits or opportunities for advancement).

It is essential that any move toward work at home (especially in the clerical sector) be based on the same principle of equal opportunities for advancement. The long term implications for human resource planning, training, classification and other organizational concerns should be well thought out and the implications for women (eg. occupational segregation, equal pay, etc.) should be assessed in light of equal opportunity goals.

RECOMMENDATION 9: Treasury Board should undertake a thorough study of the implications of alternative work site arrangements from both the employer and employee point of view and develop a policy with guidelines for departments.

RECOMMENDATON 10: Any work at home arrangements should be flexible and take into consideration the needs of employees as well as managers.

RECOMMENDATON 11: Public Service policies should be developed in consultation with employees to allow experimentation and implementation of the new opportunities offered by technology in the areas of handicapped workers, flex-time and flex-place. These options should be considered as part of the required human resource planning.

3.3 Individual Level Changes Expected (the working unit)

The issues at this level are those that affect the individual directly in his or her daily work. These issues can come under some control of the unit manager or the middle level manager who may alleviate the problems with some support from organizational policies and with employee participation.

3.3.1 Health and Safety in the Workplace

The major health and safety issues of concern to employees are the effects of radiation, possible stress effects and physical effects of office automation.

3.3.1.1 Radiation

Concern has been widely expressed in the press about the potential effects of radiation from visual display terminals (VDT's). The Radiation Protection Bureau of Health and Welfare Canada as well as other reputable investigators in other countries hold the view that there are not harmful radiation emissions from VDT's. (Treurniet, 1982) Despite these assurances, the public continues to be fearful. Partly this fear seems to be based on the assurances that were given in the past about, for example, asbestos or Thalidomide, which later proved to be incorrect. Partly they are based on the still continuing controversy among experts about the possible effects of low frequency radiation, and about cumulative, long-term or synergistic effects of radiation.

The fear of radiation has been of particular concern to pregnant women and some companies have agreed to move pregnant women, as well as women who are planning to become pregnant in the near future, off the machines without loss of benefits. In a recent judgement in Ontario Supreme Court, a woman was granted compensation because a company fired her when she did not want to work on a VDT after becoming pregnant. Thus, regardless of evidence regarding any real effects, the fear of radiation will be an issue that must be addressed by the Public Service.

In response to concerns expressed by a number of employees about the performance of all or part of their duties on VDTs, the Federal Government established in April, 1982, a policy on the transfer of pregnant employees. The transfer is subject to the employee presenting a medical certificate and to the availability of another similar position within the department. Such a transfer can occur without appointment.

RECOMMENDATION 12: Studies into the potential effects of radiation from visual display terminals should be conducted on an on-going basis by an independent research organization. The federal government should continue to monitor on-going studies on potential radiation effects.

RECOMMENDATION 13: Public Service Commission should ensure through its policies, that pregnant employees not wishing to work on VDT's are granted priority for appointment.

3.3.1.2 Stress

Hans Selye (1974) defines stress as being the non-specific response of the organism to any demand made upon it; the response is the same whether the agent is pleasant or unpleasant. He refers to distress as being the excessive response given to a noxious or unpleasant stress.

Commonly we use stress in the sense of distress: prolonged physiological response of an organism to emotions or stimuli in the environment that can result in damage to body tissues or in abnormal behavioural responses.

Stress, in the sense of distress, is a common factor in our industrial environment and the question for office automation is whether it increases stress significantly and whether any such increases can be reduced by the way work is organized. Since research suggests that stress can result from either over-stimulation or boredom (Bradley, 1981), the research related to office automation should be geared to determine the optimal level of stimulation that favors the optimal performance (without distress).

RECOMMENDATION 14: A study should be undertaken of the empirical evidence relating to stress and stress-related disorders that might be expected to arise from office automation and any evidence related to how to determine and to control the optimal level of stimulation in the automated office environment.

3.3.1.3 Other Physical Effects of Office Automation

There is some empirical evidence to support the concern that office automation can have other negative physical effects on employees. The National Institute for Occupational Safety and Health (NIOSH) in Cincinnati, Ohio, has been conducting tests for about six years; they have found that vision, stress

and musculature problems are much more prevalent among VDT users than among the general working population (U.S. Department of Health and Human Services, 1981). (See also Rosenbaum, 1981; Treurniet, 1982). In Canada, the Canadian Labour Congress recently released a report on a survey of 2330 VDT operators; undertaken in November-December 1980. The report provides data on the link between health symptoms (eyestrain, musculo-skeletal discomforts, psycho-social stress symptoms) and workplace condition (machine characteristics, lighting, ventilation, workplace design and work organization). There is evidence that, in addition to the effects of VDT's, some problems may be caused by the organization of the work environment (see Section 3.3.2 regarding privacy and autonomy) and by the design of work stations, and by the spatial arrangements in which work stations are set. Problems such as chronic fatigue, irritability, musculature pain, and eyestrain have been attributed to these organizational and physical features of the environment.

The physical effects of office automation might be alleviated by appropriate organizational design, office layout, workspace design and attention to quality of working life considerations.

RECOMMENDATION 15: Treasury Board guidelines in office space should be reviewed to incorporate space for office automation equipment as new equipment is provided for employees at all levels.

RECOMMENDATION 16: Employees who will be using office automation equipment should be consulted on issues related to office organization and layout and work station design.

RECOMMENDATION 17: The federal government should ensure a continuous monitoring of physical effects of office automation on employees and provide, in guidelines on the implementation of office systems, indications as to how to handle them.

3.3.1.4 Usability as a Requirement for Functional Specifications

Usability has been defined as the quality making a device convenient and practical for a discretionary user, one who is not a computer specialist. Usability must be designed into a product from the beginning; it cannot be an add-on. Design features can meet both the physical demands of users such as comfort and flexibility; and the cognitive requirements of users such as understanding messages and ease of learning.

Some companies are now specifying the functional characteristics of the end products they commission in terms of usability. For cognitive human factors, this requires the manufacturer to provide measures of performance. For example, performance may be specified in terms of expected training time for the intended population, time to achieve an "automatic" reaction, kind and rate of errors, time to recover from errors, warm up time when work is resumed and others. (Bennett, 1979).

Making human factors considerations part of the specifications for office equipment procured for the Public Service can have two disadvantages: 1) it will likely make the equipment more expensive; 2) while developing standards for an organization like the Public Service can reduce learning time for employees who transfer from one environment to another, standards may also freeze the design and not allow improvements as new ideas occur.

Ergonomics aims at providing a better "fit" between the machine and the person using it. Ergonomic requirements are increasingly used in the design of new office equipment, work stations and office layout. If the technology is designed to reflect the needs of individual equipment operators, these employees will likely be more productive and satisfied with their work, and less prone to suffer adverse physical effects related to automation.

At this writing, the Canadian Standards Association has struck a panel on ergonomic standards for office equipment. The panel is expected to take two years to complete its work.

RECOMMENDATION 18: In procuring equipment for office automation of the Public Service, serious consideration should be given to making human factors measures part of the functional specifications of design.

3.3.1.5 Public Service Policies Related to Health and Safety Issues

The occupational health and safety of Public Service employees should be a prime consideration in the planning, design and operation of office environments To the extent that it is reasonably practicable, measures must be taken to ensure safe and healthy working conditions and procedures for employees. Employment health and safety is the responsibility of the occupying department or agency, pursuant to policies and standards approved by the Treasury Board and issued through the Personnel Policy Branch.

The health and safety objectives are to prevent or reduce the risk of occupational injury and illness through the identification and correction of potential hazards in the working environment. Such hazards (e.g., excessive noise, toxic fumes, radiation, unsanitary conditions) are normally prevented by the application of the various health and safety standards and by the use of inspection and monitoring activities. Assistance in respect of the program is available from many sources, including the Departments of Labour and National Health and Welfare.

RECOMMENDATION 19: Treasury Board should review occupational health and safety standards to determine whether they are adequate and appropriate for the automated office. These standards should be revised if necessary and applied.

RECOMMENDATION 20: Line managers should be educated in the health, safety and ergonomic issues related to office automation and in the policy options available to managers so that the manager can consider employees' needs in planning for change. Employees should be given similar education.

3.3.2 Privacy and Confidentiality: the problem of monitoring and loss of autonomy

The introduction of office automation is often rationalized by the expected improvement of management control systems. The increased integration of office automation with communications technology permits the collection of still more elaborate organizational performance data, such as performance records, meeting and travel schedules, sick leave, etc. However, many have voiced the fear that automated systems will depersonalize management communications, leading to alienation, obsessive monitoring and loss of privacy. As the office automation system becomes the vehicle for most work, the records automatically retained will represent a fairly complete picture of the individual's performance. For example, the connect time may be compared to the computer resources used for a profile of how much "work" the person accomplished. Although performance records such as these are controversial and have serious privacy implications, they are being maintained, particularly in word processing systems, and they may be an effective tool for monitoring productivity. (Uhlig, Farber and Bair, 1979).

3.3.2.1 Privacy and Productivity Measurements

According to most reports, obsessive monitoring is a source of stress to employees. Computerized switchboards can measure a telephone operator's work second by second: "the computer records when the operator begins work, when she stops, when she takes a break and for how long and how often. It has made an already boring and stressful job even more demanding and brain-numbing." (Mather et al., 1981, p.6). Computerized monitoring of productivity and performance in word processing and cashier jobs is also a source of anxiety (Menzies, 1981). Occupational stress is raised by excessive monitoring and this in turn increases the level of job discontentment and fear of unemployment. In addition, monitoring measures can be misused as measures of output because the difficulty of given tasks is highly variable. Such misuse is threatening to employees.

In some countries, unions have successfully fought the collection of these types of detailed measurements of what a person does all day. Some unions in Canada have identified checking and monitoring of performance data as a threat, especially when used to substantiate decreases in work hours, releases and appraisals of employee performance (BMC, 1981).

There is apparently a trend to reject close and burdensome supervision by today's workers (Brown,1982). Brown states: "there is increasing evidence that one of the objectives most wanted by working men and women at all levels in our times is freedom from supervision". He also identifies a tendency for Americans to value occupations requiring minimal supervision which allow for more autonomy and greater participation in the design of work.

The causes and precise nature of the reaction of employees to excessive monitoring has yet to be empirically established. The following hypotheses have been generated by a review of literature. Stress and dissatisfaction may result when the system of monitoring employee performance is designed in such a way that:

1) it sets standards for the pace of work at an inhuman level, monitoring and controlling every minute of an individual's working day so that there is not room to behave autonomously or escape scrutiny;

2) the "objective" measurements produced are inaccurate assessments that do not take into account important aspects of the work itself (eg. its varying difficulty), thus imposing unreasonable demands for performance;

3) the employee feels threatened by the knowledge that performance is being automatically monitored and used to substantiate releases, while at the same time being generally unaware of the scope of the data collected or the nature of its analysis;

4) access to performance records, feedback, and ability to correct errors or explain poor performance are denied the employee, resulting in a loss of control over the personal information supplied;

5) the machine demands constitute what would ordinarily be considered harassment, if analogous supervision were being administered by another person.

3.3.2.2 Measuring Productivity without Excessive Monitoring

Within the Public Service, an effective system of measuring productivity has been developed in one unit at Statistics Canada in consultation with employees. The old volume of work measures based on keystroke counting proved incapable of reflecting the varying difficulty of different jobs in terms of keying and coding. Straight comparisons of individual A to B were unfair and inaccurate because one person who had all the difficult jobs may have produced a lower volume of keystrokes, although in reality having done the best work.

Working groups of employees and managers determined a new system that would take all aspects of the job into consideration. In the new system, performance is measured in terms of what the operator does while she is signed on to the machine. This is exclusive of sign-off periods, which go into a separate assessment of percentage of production time. Employees know what is expected of them in terms of meeting standards (an earlier problem was the lack of an established method of feedback to employees on their performance). Each employee is familiar with the job performance reporting scheme, and can obtain a copy of their weekly performance report to determine their calculated level of effectiveness.

3.3.2.3 Alleviating Concerns about Monitoring and Invasion of Privacy

The major point to be made from the preceding discussion is that if the automation of supervision is to be successfully implemented without interfering with privacy and job satisfaction,

1) individual employees must be consulted, and must participate or be represented in negotiations concerning the manner in which personal data is to be collected, analyzed and interpreted.

Two other points may be made from the literature on privacy and computers. These are two basic principles that are reiterated as basic recommendations for the protection of personal privacy:

2) only pertinent personal information may be stored; and that collected for one purpose may not be used for another

3) individuals must be informed of the existence of such data, and will have the right to challenge or correct items they believe to be in error.

RECOMMENDATION 21: Employees at all levels should be consulted and should be allowed to participate in decisions about the type of data collected and how it is used to monitor their productivity and assess their performance.

3.3.2.4 Privacy Legislation and Public Service Policies

Part IV of the Canadian Human Rights Act, designed to protect the privacy of individuals, established an individual's right to determine or find out but not to control what records of personal information are used for administrative purposes by federal government departments and institutions, to ascertain the uses made of such information, and to examine these records and request correction. It is the administrative policy of the government to inform individuals of the purpose of information collection, to provide individuals with some control over the use of information concerning them, and to ensure rights of access of individuals to personal information concerning themselves, subject to the limitations imposed by Part IV of the Canadian Human Rights Act(1). Chapter 415 of the Administrative Policy Manual states that it is the

1 It is expected that Bill C-43, the new Privacy Act, which replaces Part IV of the Canadian Human Rights Act, will be proclaimed in 1983. This Act strengthens the privacy legislation by defining personal information and its uses and allowing for appeal to court for refusal of access to personal information held. In addition, the new Act provides that collection of information by federal government departments must be limited to that related to the programs of the department.

policy of the government that personal information used for administrative purposes be consistent with the reason for original collection. According to the Act, every individual is entitled to be consulted and must consent before personal information concerning that individual is used for any non-derivative use for an administrative purpose, unless that non-derivative use is authorized by law.

One particularly relevant policy directive in the Administrative Policy Manual states that in seeking consent for non-derivative use, government institutions shall clearly inform such individuals of the scope of the information in question, the particular uses for which consent is being sought, and the consequences of giving or withholding consent. The administrative policy directives and guidelines apply equally to employee information banks, a sub-class of an individual information bank which contains information about federal employees related to their status or capacity as federal employees, which is used for personnel and other administrative purposes.

Although there are laws and policies which relate to the privacy needs of employees, they do not necessarily resolve the specific issues that office automation raises in this regard. The requirement for consent would appear to extend only to those situations where non-derivative use is being made of information about the employees. If the original purpose of counting keystrokes and monitoring the operator's time-off and time-on the machine is to assess the employee's productivity, then the employee has the right to be informed of the fact that such use is being made of the data being generated. However, the employee does not have the right to be consulted about the manner of collecting such data and the fairness of the measures. Neither is the consent of the employee required. So, although the employee may have the right to correct the information collected, there is nothing to ensure the right to correct the

manner in which it is collected and analyzed, which, as demonstrated, may represent a lack of respect for an individual's privacy needs, resulting in the development of intolerable working conditions.

RECOMMENDATION 22: The Treasury Board should review its administrative policies relating to privacy of individuals in light of changing technology and office automation. Such a review should recognize the empirical validity of an individual's privacy needs as an important factor in the relative improvement or deterioration of the conditions of work.

3.3.3 Isolation and Alienation

Isolation refers to the separation of an individual from fellow workers or from people in general. This isolation can be social or physical or both. Alienation, on the other hand, refers to separating workers from the end result of their work. Office automation, if it results in job functions that centralize work such as in a word-processing pool, has the potential of alienating people from the end result of their work. Isolation from fellow workers could be either increased or decreased by office automation, depending on how the work is organized within the group. Social communication could be enhanced by office communications networks. Bringing together employees with similar interests or complementary skills even if they are separated geographically, could provide psychological supports that were not available previously to employees.

Both isolation and alienation can have negative effects on productivity. Most employees are more productive if they work together with others. In the extreme, isolation can lead to many types of psychological problems for the employee, while alienation can lead to workers not caring about the quality of work they produce.

RECOMMENDATION 23: A study should be conducted of the effect of office automation on social communications among workers to include the potential for social isolation and alienation and the potential for new social contacts and new types of social interactions for workers.

3.3.4 Special Interest Groups: Handicapped, Natives, Women, Francophones

While much emphasis has been placed on the negative impact which office automation may have on women, concern should also be given to other special interest groups in the Public Service.

The automated office, with its emphasis on intellectual abilities rather than brawn, will open the door to employment for many seriously physically disabled people. Opportunities for employment should increase for homebound disabled people.

RECOMMENDATION 24: Special measures should be taken to ensure that special interest groups such as the handicapped, francophones, natives, women are not disproportionately affected adversely by office automation and that they are given opportunities to benefit from it.

4. MANAGING THE PROCESS OF CHANGE: Introduction Strategies.

Any change introduced into the workplace could meet with resistance and frustration on the part of employees. At least some of the resistance is often associated with real concerns about loss of jobs, changes in reward schemes and changes in the quality of working life. It is generally recognized that the introduction of change is greatly facilitated by good planning involving a multi-disciplinary approach, and by meaningful consultation with employees at all levels. It is these two processes, planning and consultation, that are suggested as the important elements in a strategy for introduction of automation into the Public Service.

This section of the report considers the management of change associated with automation in the Public Service in general. In the following section, the ideas presented here will be addressed to the field trials of automation now being implemented within the federal government.

4.1 Planning for the Human and Social Issues arising from Office Automation

Before office automation is introduced into an area of the Public Service, planning should be done to outline the impact that the automation might have on the working unit regarding the human and social issues presented above. The planning should include a description of what is being done within the unit before the introduction of new technology, the human resources available in the unit, the expected level of automation, the time frame for introduction, the expected changes, and some strategies for dealing with the changes. The Employment Impact Statement presented in Appendix A lists some of the specific questions that might be asked during the planning.

RECOMMENDATION 25: In their human resource planning prior to the introduction of office technology, departments should take into consideration the impact of the introduction of technology on career progression and other human and social issues in order to minimize any negative impacts on employees and on particular occupational groups.

4.2 Consultation with Employees Regarding the Human and Social Issues Arising from Office Automation

Employee understanding, involvement and meaningful participation are important in order to ensure smooth implementation of the goals when a change is introduced as a result of office automation. This can be achieved, in part, through the existing mechanism of labour-management consultation which has been established through the process of collective bargaining. It is the policy of the Employer to establish and actively support effective labour-management consultation within the Public Service. This policy and guidelines for the consultation process are reflected in the Personnel Management Manual, Volume 7, Chapter 8.

Consultation committees provide a forum where management and employee representatives can meet on a regular basis to discuss a number of subject areas, including planned changes in departmental programmes and equipment, occupational health and safety and physical working conditions. The committee functions as a two-way communication system for discussion of problems, areas of disagreement and for the alleviation of fears and prejudices often created by rumours.

In addition, special provision has been made for consultation on the working conditions of employees by the National Joint Council's Committee on Occupational Health, Safety, and Physical Working Conditions.

In addition, to formal labour-management consultation, the model for working group consultation provided by The Quality of Working Life Program in the Public Service is recommended by the Committee as an effective structure for allowing employees to participate in the implementation of office automation.

The model consists of the following:

a) A senior Committee which has the functions of:

   1) hearing reports and recommendations and 2) providing support for innovative approaches to addressing issues.

b) An interdepartmental working group or groups representing participating organizations, which serves to bring the issues to the attention of the senior comittee.

c) An interbranch/interdivisional working group which serves to coordinate policy in different parts of the Public Service regarding the issues.

An example of this model in practice is provided by the Office Communications Program which now has the committees in place that reflect the model. The senior committee is represented by the Users' Group, the

interdepartmental working groups are represented by the subcommittees of the Users' Group and the interbranch working group has been put in place among participating field trial sites to deal with common issues.

This model of consultation should involve all of the stakeholders in an issue. In the Office Communications Systems program this is now true since the invitation was issued to unions to participate in the activities of the Users' Group.

The process of consultation should also include some briefings to those who will be directly affected. These orientation briefings can inform potential participants, listen to their concerns and enlist their cooperation. Such briefings could head off problems in the early stages. They will also be important to the process of planning and the development of policies both of which will assist unit managers in carrying out their responsibilities concerning the well-being of employees.

RECOMMENDATION 26: Representatives of employees at all levels should participate in the planning stages from the beginning of an office automation project.

RECOMMENDATION 27: The federal government should provide briefings for decision makers prior to their design of office automation systems. These briefings should include consideration of the human and social issues.

RECOMMENDATION 28: Orientation briefings should be given for all employees at all levels directly affected, about the issues and implications of office automation at the time the decision to introduce office automation is made.

The process of consulting and briefing of employees of the Public Service as automation proceeds will tax the available resource of knowledgeable people unless the government addresses this as a separate training need. The Human and Social Impact Committee was approached on two occasions to provide briefings for management where office automation was being implemented but declined because of lack of time or mandate to do such training.

RECOMMENDATION 29: Treasury Board in conjunction with Public Service Commission should consider establishing a program to provide education on human and social factors in office automation.

RECOMMENDATION 30: Studies undertaken by the federal government arising from this report on issues related to office automation should have management and union representation on the planning and implementation.

5. FIELD TRIALS OF OFFICE AUTOMATION IN THE PUBLIC SERVICE

This section deals with what could be done in the office automation field trials now beginning in the federal government to explore the human and social issues and the policies that will lead to a better quality of working life for Public Servants.

The overall objective of the field trials is to facilitate market entry for a Canadian office automation industry through:

a) the production of system designs and functional product specifications to which Canadian industry can respond with product line systems and subsystems that can meet the needs identified;

b) experimentation with partial or full office automation systems and the testing of the functionality of these systems in terms of their impact on productivity, organizational adjustments, user acceptance, overall effectiveness and improved delivery of departmental services;

c) the development and application of general office systems methodology which will aid prospective users and industry in defining, planning and implementing integrated office information systems;

d) the provision of test beds in which research and analysis can be undertaken on the economic, social, and behavioural aspects of office automation.

It is suggested that the evaluation of the human and social issues of office automation in the field trials have the following objectives:

a) to investigate the extent to which the human and social issues, including those listed in this report and any others that might arise, occur during field trials of office communications systems;

b) to implement planning and consultation processes for the introduction of office automation and to investigate and describe the effectiveness of these processes;

c) to analyze the quality of working life of the employees concerned before and after the implementation of office automation;

d) to make specific policy recommendations based on the evidence from the above investigations aimed at alleviating problems or improving the quality of working life of employees in the Public Service as it is affected by office communications systems.

RECOMMENDATION 31: The field trials being designed under the Office Communications Systems program in the federal government should be used as testing grounds to investigate the human and social issues of office automation, to investigate implementation strategies and to recommend policies for the federal Public Service based on these investigations.

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8. APPENDIX A

Employment Impact Statement

1. What is the kind of work that is being performed?

2. How is it being performed at the outset of a project? What hardware (if any is in place at the outset of a project, including how many machines and what kind of machines?

3. What are the employee profiles including occupational group and level, sex, official language status, handicapped, native, age and educational profiles?

4. What is the proposed or conceived organizational structure?

5. What strategies are proposed for training, retraining, redeployment?

9. APPENDIX B

Office Communications Systems Program

OCS Users' Group

Human and Social Impact of Office Automation Committee

TERMS OF REFERENCE

1. Introduction

The Committee recognizes that the development of office automation in government and industry has begun in Canada and will continue as the technology develops. The Committee will investigate ways in which the opportunities and benefits of office automation may be distributed equitably so that all sectors and groups in Canadian society may benefit. Recognizing that there are perceived and potential human and social benefits and problems arising as office automation proceeds, the Committee will search for ways to enhance benefits and rectify or minimize problems.

2. Issues

Office automation is the application of information technology including the use of computers and telecommunications to Canadian offices in government, industry, university or elsewhere to meet organizational objectives.

Arising from the introduction of technology are issues which concern the human user both at an individual level and at a broader social level. The technology, the individual user, and the social/legal context must change and adjust to each other to reap the benefits and minimize the possible harmful effects of the introduction of technology.

A partial list of issues follows and may be further developed as the Committee's work proceeds.

2.1 Training and education programs.

2.2 Job classification and personnel management.

2.3 Strategies for introduction of technology to meet resistance and needs of employees.

2.4 Design of terminals, systems and environments to meet employees needs, including health and safety issues.

2.5 New career opportunities and potential for employment/unemployment.

2.6 Privacy and confidentiality needs of individuals.

2.7 Organizational structure changes to be expected.

2.8 Community and family life changes.

3. Structure

3.1 The Committee reports to the OCS Users' group and is under its general direction.

3.2 The Committee's chair is appointed by the Users' Group.

3.3 Membership on the Committee includes representatives of at least five departments of the federal government including Treasury Board, Public Service Commission and the Department of Communications.

3.4 Additional membership on the Committee will be at the discretion of the Chair.

3.5 The Committee will strike subcommittees as required. Subcommittees may invite the participation of any person from within or outside the federal government.

3.6 The Committee will continue as long as the OCS Program continues unless otherwise advised by the Users' Group.

4. Responsibilities

4.1 The Committee will collect information about the human response to office automation both within and outside the federal government. The Committee will seek information and ideas about the issues it identifies and attempt to summarize the information for the Users' Group. Information may be collected by review of previously prepared reports, by field trips etc. and by receiving briefs and presentations from interested groups. Unions may be requested to present their points of view.

4.2 The Committee will comment on and bring to the attention of the Users' Group issues it feels to be important and will make recommendations wherever possible.

4.3 The Committee will encourage research on the issues arising from the human and social impact of office automation by identifying specific areas where research would advance knowledge.

4.4 The Committee will pay particular attention to the needs of women, handicapped, Canadian Native groups and francophones in the automation of federal government offices.