The Office
of the Future

by
Sharon Coates

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This text was prepared by the author for the Department of Communications as part of its special publications program which is designed to contribute to public awareness of issues of importance to the development of communications in Canada. The views expressed herein do not necessarily reflect those of the department.

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Introduction

The office of the future will be dramatically different from even the most modern, up-to-date office of today. By the end of the 1980s, the office will have undergone a remarkable transformation as a result of automation. Not only will the equipment in the office of the future be new and different, but office personnel will also have new roles, skills and ways of interacting.

By the end of the next decade, futurists predict that the familiar stand-alone typewriter, filing cabinet, telephone and office copier will have merged into a single office communications and information processing network. At multipurpose, "intelligent" work stations, managers and support staff will be able to perform a number of functions – recording notes and drawings, taking a letter, filing information, displaying a page from a file and sending a letter – all electronically. From these work stations, it will be possible to make a telephone call, leave a message, have copies made, print forms or edit a report. All work stations throughout an organization will be linked to computerized information storage centres, a duplicating and printing centre, and a communications centre which, in turn, will be linked to other electronic offices by networks providing message, data, image and voice communications.

The proliferation of paper so familiar in today's office will be greatly reduced as information is transferred from paper to electronic form. The time spent filing and retrieving correspondence, documents and drawings will be reduced drastically and the cost for paper, business forms, filing cabinets and storage space – not to mention labor – will be cut considerably.

The implications of this transition to the office of the future are far-reaching, both economically and socially. Jobs for Canadians, expansion of Canada's industrial base, a favorable balance of payments and national sovereignty are all at stake. The composition of the labor force will undergo a radical change, affecting all of Canadian society. The distribution of tasks between labor and management in the workplace are also expected to shift.

Canada has an opportunity to capture part of the potentially huge market for automated office systems and services. It has the capability, based on our current position as a world leader in telecommunications and computer applications. Canadian developments in computer communications, digital data transmission and switching, microprocessor applications and related technology such as satellite communications and fibre optics can open the door for Canadian industry to compete effectively in world markets.

Will the office of the future be a reality by 1990? Technologically, it is feasible right now, based on the latest advances in computer and communications technology and office equipment. The 1980s will be a period of transition as the operating systems become better defined and competitively priced.

Automation is seen by industry, business and government as a means of increasing the productivity and efficiency of the workplace. For a business, this means an improvement in its competitive position as labor is the single biggest contributor to the total cost of running an office. With the growth rate of office labor being considerably higher than the growth rate of the labor force in general, office costs are growing at a disproportionate rate. Automation of repetitive and low skilled activities at all levels of the office hierarchy promises to provide an alternative to these rapidly soaring costs. As individual companies adopt automation to improve their competitive positions, the net result will be intensified competition among national economies, from which Canada cannot escape.

Preliminary market studies indicate that by 1985, expenditures for office products and related services in Canada will probably double the 1978 level of $6 billion. By 1990, these expenditures are expected to double again. In the U.S., projections indicate an increase from $62.5 billion in 1978, to between $220 and $322 billion by 1988.

A major consideration in the introduction of the office of the future is the attitudes and feelings of the people in the office towards these new tools. Resistance to change is a powerful factor operating at all levels in an organization. While a successful introduction will depend on the extent to which the needs and attitudes of workers are taken into account, it is also true that the users – both labor and management – will need to adapt to the new technologies by learning new skills and adopting appropriate attitudes.

Equipment must be "user friendly", and the ways in which both equipment and new procedures for its use are introduced into the office must involve the ultimate user. Studies have shown that in

introducing automated equipment, the users must be involved from the very beginning, even at the planning stages, otherwise it risks rejection and the potential benefits will not be realized. Behavioral research into this whole area is necessary to avoid alienation of office personnel in attempting to automate the office.

In summary, office automation is evolutionary and inevitable. It could rejuvenate and expand the Canadian office equipment industry and allow for a greater proportion of our needs to be met from a domestic industrial base. Success in doing so requires a new strategy based on active co-operation among Canadian firms and governments. A carefully planned, integrated approach both to development and marketing and to user education and acceptance is needed if Canada is to benefit from the automated office.

2

The
office of
today

When the manual typewriter was first introduced into offices at the end of the last century, it heralded the coming of the industrial revolution to the world of commerce and business. It must have been regarded as an astounding device by office workers of the day, requiring a new skill for its operation. It made some jobs obsolete, but opened up new job opportunities. It greatly increased the productivity of the office and vastly improved the quality of its output. The introduction of the telephone had similar, far-reaching effects. No one in today's office would want to be without these essential devices.

The typewriter and the telephone have undergone many changes and improvements since those early days. The electric typewriter was a big step forward. The high quality telephone service which has been extended through the use of communications satellites is a service now taken for granted in the office. At the same time, many other devices and services have been introduced into the office. Dictating machines, intercom systems and calculators have become commonplace. Message and facsimile services have improved communications between offices. With the introduction of the office copier, the amount of time and effort required in typing and making large numbers of carbon copies was greatly reduced.

More recent arrivals on the office scene are data processing services, now an integral part of most office operations throughout industry, commerce and government. The word processor is also becoming increasingly common, eliminating repetitive typing jobs.

In 1973, Canada became the first country in the world to have a commercially available digital data communication system which increased the speed and efficiency of communications between computers. This system meant that offices from one end of Canada to the other could be linked by a more efficient computer network, broadening the range and speeding up inter-office communications.

A look at the vast array of office equipment and services on the market today shows just how far the office has advanced since the introduction of that first typewriter. More and more office equipment is becoming automated and a few multifunctional devices are appearing. The merging of telecommunications, computer and office equipment systems is underway.

Several companies now have so-called "intelligent" typewriters on the market – machines the intelligence of which is stored in preprogrammed microprocessors. These electronic typewriters automatically type frequently used words and phrases, such as dates, salutations and addresses. The formats for business forms such as invoices can be stored so that tabs and margins do not have to be set up every time an invoice needs typing. The location of each piece of information on the form is stored as well. The intelligent typewriter also sets up letters, tells typists when they are nearing the bottom of a page and lets them see and correct mistakes on a display before they are printed.

The first generation of the "intelligent" copier is already on the market. The use of microprocessors with office copiers has not only increased their speed, but has greatly increased their reliability by reducing the number of mechanical parts. These copiers also have the capability of diagnosing their own problems and indicating the problem area to the operator. The newest of these copiers can produce 75 copies of a page in 60 seconds.

Filing is also being automated. One company sells an automated filing system which uses an electronically controlled mechanism to extract selected file containers from a central storage area for delivery to the work station. With another of this firm's systems, files are scanned electronically and nudged forward on their shelf for manual retrieval. They can be replaced randomly in any sequence.

Multipurpose systems have been put into operation which perform data processing, word processing, translation, copying, data communications and electronic mail functions.

The latest in computers includes pocket-sized data processors and business card-sized calculators. Optical character readers – machines that read – are now in use, and voice synthesizers – machines that talk – make it possible for a computer to respond vocally to users. Devices with a limited vocabulary for voice recognition — machines that hear — are here now.

Electronic work stations with packaged application software are starting to become affordable for smaller sized companies. Once only feasible for large firms and institutions, work stations now give

smaller businesses the capability of automating tasks such as their accounts receivable and payable, general ledger, payroll, order entry, inventory and information storage.

Electronic mail is a general term that covers a wide variety of methods for transmitting different kinds of messages or data. Message communications and facsimile services are two forms of electronic mail services which have been in use for some time. These services are being improved, expanded and merged continually.

In May 1980, CNCP Telecommunications announced plans to provide a computerized news service, Telenews, to about 500 subscribers on its Telex network on a trial basis. Another form of electronic mail is the message delivery services offered by the national telecommunications carriers (CNCP Telecommunications and the TransCanada Telephone System) and other companies such as I.P. Sharp, with its Electronic Mailbox service. Using one of these services, a user can pick up his or her telephone or sit down at a terminal and key in a special code to receive messages electronically.

Large corporations such as airlines and hotel chains use their own communicating computers and work stations for electronic message delivery. Others use an in-house electronic mail service to link their head office with their branch offices and customers. Communicating word processors can be used as the terminals for such systems linked by digital transmission and packet switching networks. The Canadian networks are linked to international networks.

3

The office
of
tomorrow

Advance publicity for office systems and services coming onto the market in the next few years shows that the trend toward automation is picking up speed. The distinction between office equipment, computers and communications equipment as we now know them, becomes more and more blurred as we look further into the 1980s. Here, for example, is a prediction of how units such as the multifunctional work station could evolve and during the next decade gradually replace existing office equipment.

The multifunctional work station

Multifunctional work stations for secretaries are expected to be a common sight in Canadian offices in the not too distant future. This unit will be used to prepare correspondence and reports, send and receive mail electronically and store simple file data. Initially this equipment will handle printed material only, but rapidly falling memory and storage costs and the availability of more powerful microprocessors will bear a new generation of equipment capable of handling images and voice communications as well. The electronic work station for the professional will become as essential a device as the electronic calculator of today.

In the eighties, individual work stations within the office will increasingly be interconnected with other intelligent office machines such as copier/printers, mass storage files, micrographic and facsimile devices. These in turn will be interconnected to public and private telecommunications networks.

It will then be possible for millions of preprinted business forms to be replaced by programmed displays, and shelves full of office procedures manuals to be converted into standard programs. It will be possible for messages, action lists, calendars and meeting dates to be handled by the terminal. Personal routines for specific activities will be transformed into programs tailor-made by the user and which can be repeated on demand.

The multifunctional work station, adaptable to the needs of the individual office and employee, is the key to office automation. Such devices will allow an organization to enter office automation gradually by focussing on the most important need first and progressing to subsequent stages at a suitable pace and in a orderly fashion.

What's coming next?

Another revolutionary device for the office of the 1980s is the intelligent copier/printer. In combination with a microprocessor and data storage, the intelligent copier/printer can function as a high speed computer printer for correspondence and business forms. It can function as an optical character reader to convert typewritten pages and incoming correspondence into computer processible form. Finally, in combination with a communications controller, the unit can function as an unattended electronic mail device, transmitting and receiving correspondence or other data after business hours.

One of the most intriguing products, now in its initial marketing phase, is the "electronic briefcase". This briefcase will contain in one side a display screen and an electronic keyboard. It would include a coupler which could be used for communicating over the regular public telephone network or for dictating onto the screen and into the memory of the "briefcase". Its future versions would likely also have the capability for making copies of the text or graphics displayed on the screen.

Among the products for improved voice communications include store-and-forward voice services and intelligent telephones. Organizations in industry and government that operate private telephone networks will be able to implement electronic message services at low marginal cost using the electronic telephones and telephone switching equipment which is expected on the market in 1981. Tie lines, foreign exchange and WATS services could be more effectively used after business hours for overnight message service without human intervention.

Reliable overnight electronic mail service will soon be available to the general public. For example, two competing systems, CNCP's Infotex and TCTS's Envoy 100, are expected to be operating commercially during 1981.

Infotex will eventually comprise the Canadian segment of a planned worldwide network of communicating word processors. Standards for such international networks are being established by the International Telegraph and Telephone Consultative Committee (CCITT). Envoy 100 users will also be able to communicate with users of the Telenet and Tymnet networks in the United States.

The ultimate office of 2000

By the year 2000, the ultimate office will not only be automated, but will also be integrated so that information collection, storage, production and communications will be handled by a single system. Voice, electronic mail, payments, graphics, computer data and images will all be transmitted and switched over the same facilities. Office work will no longer use reams of paper, as information will be handled largely by electronic laser-recorded means. Office operations will become coherent, measurable and more manageable. Most importantly, instantaneous communications between the office next door and the office across the country or around the world will make organizations and work stations independent of geographic location.

The work station will be user programmable to provide the functions required by each specific organization as well as individual staff members. Executives will have a model of the organization with which to work, while other specialized personnel will be able to access and modify information on payroll, personnel files, accounting, inventory and so on. All of the work stations throughout an organization, both locally and remotely located, will be connected through a network to each other and to central locations for data storage, duplication and communications control.

In major metropolitan areas, offices will be interconnected through local networks. For interconnection to more distant areas, the office will be linked through its communications centre to one or more of the available common carriers. The carriers will use communications satellites, microwave networks and other facilities to transmit messages, data, voice and images. They will provide the links to specialized information service centres and data processing centres which will handle complex or extensive computations.

4

The
human
side

The office of the future is both economically desirable and technically possible. Whether or not it actually becomes a reality in the next decade, or indeed ever, hinges on a third factor, the people in the office and their attitudes and feelings about the new technology. This factor often seems to be overlooked or given little consideration in some of the publicity that glowingly paints a picture of the office of the future.

Increased office productivity will be brought about not merely by designing the appropriate automated equipment and integrated systems, but will also depend on how well office personnel adapt to new equipment, new procedures, new roles and new ways of inter-relating. And this applies to managers to perhaps an even greater degree than to support staff. New equipment and systems should be designed to fit the needs of office personnel and not the reverse. Designing new equipment and systems to fit people will enhance the overall performance and effectiveness of the office and its staff – although clearly in some ways people must also adapt.

What is an office?
It has been suggested that the office deals in information, a somewhat nebulous and not very concrete product, and that the people in the office perform essentially five basic tasks: collecting, storing, producing, processing and, most importantly, communicating information.

These tasks are all inter-related in such a complex way that it is not easy to analyze office operations solely along these lines. The lack of a comprehensive and easily understood model of the office of today makes it difficult to know how to design an effective automated office for tomorrow. Considerable research and education are still needed in the areas of office organizational development and office systems design and methodology.

The office can also be looked at as a social system in which a group of people work together toward organizational goals and objectives. Interaction between people is a basic element of the system. If in attempting to automate the office this element is eliminated altogether or reduced too drastically, the attempt will fail.

What will it be like to work in the office of the future?

Working in the office of the future will be different from working in today's office in a number of ways. The low-skilled, repetitive tasks performed at all levels of today's organization will be automated, and new skills will have to be learned to operate the new equipment that will do these jobs. People will spend more time interfacing with machines, and this will require major adjustments in work patterns and attitudes.

The advantages to those who are able to learn new skills and adopt new attitudes are many. A few of these are less time spent doing routine jobs, more challenging tasks, more sense of accomplishment and greater feeling of personal involvement. The new jobs emerging may well meet the needs of a growing number of people in clerical and secretarial categories, mainly women, who no longer find the traditional tasks of these positions personally satisfying.

While the advantages may be appealing, any change involves a certain amount of risk and is somewhat threatening to the individual. The difference in the rate at which people are able to change and wish to change must not be ignored. The fear of losing a job, loss of status or loss of power can be strong influences. There is the fear of failing to fit into a new system, fear of not meeting different expectations and the fear of the unknown – in this case, not knowing what working in the office will be like. Such fears may operate to such an extent that the individual is unwilling to take the personal risk involved in giving up old ways of working and in learning new ones.

Although discussions on the office of the future often highlight the effects on clerical staff, some behavioral researchers believe that its greatest impact will be felt at the management and professional levels, and that people at these levels will encounter the greatest rate of change. It is also suggested by some that the greatest resistance to change will come from people at these levels, since they currently rely more on personal interface with their support staff and make less use of machines.

Not just skills and work methods will be affected by the change to the office of the future, but self-image and attitudes toward the roles of

the other people in the office and organizational relationships. The future of five million Canadians presently working in offices is at stake.

Social implications

Some observers believe the impact of office automation will be felt not only by office staff, but by Canadian society as a whole. The general public, no less than the office worker, may be forced into examining attitudes to automation, the function of the office in our society and the roles of the people working in the office.

Unemployment is of primary concern to Canadians today, and the leading question is, "Will office automation result in unemployment?" The pessimistic view is that it will, that large numbers of people will be replaced by machines, that certain skills and entire job categories will become obsolete and that a number of workers who are unable to retrain or adapt will become unemployed.

Some forecast that office automation will result only in a slowing in the growth rate of the office labor force. Others predict that Canada will actually be facing a serious labor shortage by the end of the eighties as the effects of our falling birth rate begin to be felt, and unemployment will no longer be a problem. At the same time, the number of pensioners to be supported will be proportionally higher, meaning that more wealth must be created by fewer workers. The increased productivity offered by automation will be a necessity.

No one denies that there will be a shift in the skills required in the office, and the need for retraining and education to teach new skills is recognized by all. This means that our educational institutions and government employment agencies must plan now if they are to be ready to meet the needs of Canada's office personnel in the next 10 years.

Unions representing office labor are keenly interested in any move toward the office of the future. Some view the trend toward automation as a threat to the job security of their members. If office automation is accomplished without taking into consideration the needs of the office worker, conflicts with organized labor could cause serious upheaval.

Behavioral research still needed

A report by the Behavioral Research Group of the Department of Communications flags two key areas where behavioral research is needed regarding office automation:

- Research into behavioral problems including behavioral analysis during special field trials set up to test people's reactions to office automation, development of strategies for introducing automation, development of training programs, personnel selection strategies and analysis of the human factors affecting the efficiency with which people can use equipment.

• Research into evaluation methods including consideration of what factors should be measured, the measuring techniques to be used, application to field trials and a comparison of the benefits of the alternative office systems tried.

Recognizing the importance of the human factor to the office of the future, the Canadian Department of Communications has planned a comprehensive research program into the areas mentioned. Research results are expected to be of help in selecting the final sites for field trials and in designing the approach to be taken in introducing new systems at each site, taking into consideration the particular concerns of the employees at that site. Research of this sort may well be of value to manufacturers in the process of designing equipment and systems for the automated office.

5

The potential market

Staying competitive

Companies everywhere are interested in improving their competitive positions, and increasing productivity is one effective way of doing this. One of the major costs involved in running an office is labor. In 1978, $70 billion was spent in Canada on office labor alone, with another $6 billion spent on office equipment and services. If past trends in office spending were to continue, the total cost to Canadian offices could reach $150 billion by 1990 with labor costs accounting for $120 billion.

The growth rate of the office labor force, now numbering 4.8 million workers, has been proportionally higher than the growth rate for the labor force in general. For example, the number of people in clerical and related occupations alone increased 156 per cent from 1951 to 1975, whereas the total labor force increased by only 75 per cent. Automation of the office is seen by many in business, industry and government as the way to curb spiralling costs for office labor and to increase office labor productivity.

User needs

The strongest reason identified for wanting to automate the office is that of improving office labor productivity. To be most meaningful, productivity must be increased at all levels in an organization, including that of administrative, professional and managerial personnel as well as of clerical personnel.

Another need is for more effective interpersonal communications. Since a high proportion of time in the office is spent in communications between people, whether by memo, in meetings or in informal discussion, improved efficiency in this area would have a significant impact. The amount of personnel time involved in making a telephone call is a good example. Just getting the two parties on the line can take the time of secretaries, receptionists and switchboard operators, not to mention the two people being connected. If the person to whom the call is directed is not available, messages have to be noted and passed on, and the whole procedure repeated.

The need to present a good public image is always of concern to any business, and this means that the quality of office work must be high. It must be professional in appearance and error free. Information must be easily obtainable and response to customer demands must be timely. All these needs can be satisfied using automated office equipment. A preliminary market survey by the Department of Communications indicates that there is a large potential market in Canada for office communications systems.

Market forecasts

Reports prepared for the department show that purchases of office equipment and services represented eight per cent of total office costs in Canada in 1978. By the end of the eighties, they are expected to represent between 12 and 14 per cent of total costs, providing a Canadian market worth some $10 – $15 billion to the suppliers of these products. The U.S. market is expected to exceed $220 billion by 1988. Canada has a great opportunity just in meeting the demands of the domestic market and even greater opportunities in combination with foreign markets.

Looking at the Canadian market trends for specific types of equipment, the Department of Communications survey has developed some preliminary estimates:

Business telephones
- In 1978, there were approximately 4.5 million sets in Canada.
- By 1985, the number of sets is expected to peak at 6 million.
- The business telephone as we know it today may then gradually disappear from the office as multifunctional units incorporate voice capabilities.

Telex, TWX, message services
- In 1978, there were approximately 56,000 units in Canada.
- By 1983, the number of units is expected to peak at 70,000.
- Electronic mail service and private electronic mail networks will then gradually replace these units.

Typewriters
- In 1978, there were approximately 800,000 electric office typewriters in Canada.

- This number is expected to increase to 960,000 by 1985 but much of the increase and replacement will be new electronic equipment. Some will even be voice activated.
- Electronic typing equipment and multifunctional work stations will displace the present installed typewriter base by the end of the eighties.

Office copiers
- In 1978, there were an estimated 300,000 copiers in Canada.
- By 1985, it is estimated that this number will reach 450,000.
- Intelligent copier/printers will gradually replace the conventional office copiers.

Computers
- In 1978, approximately $2 billion was spent in Canada on computer equipment and purchased services.
- By 1985, this amount is expected to reach approximately $4.5 billion.
- Computer functions will become incorporated into integrated office systems by the end of the eighties.

Computer Services
- In 1978, the revenue to Canadian-controlled computer service companies was approximately $1 billion.
- By 1985, this number is expected to reach approximately $3 billion.

Multifunctional work stations
- By 1985, it is estimated that there will be 0.5 million units in Canada.
- By 1990, this number is expected to be approximately 1 million.
- By 1995, the number is expected to reach approximately 2.5 million.
- This trend will result in a reduction in the demand for single purpose devices such as data entry systems, stand alone desk computers and word processors.

Opportunities for Canadian industry

This market forecast for Canada indicates a rapidly growing demand during the next decade. Meeting the needs of a significant portion of domestic requirements would provide a solid market base for new and existing Canadian industries to capture part of the potentially enormous international market as well. Automated office products is a "light" industry, requiring a highly skilled design and production workforce, which is eminently suited to the Canadian economic structure with its highly educated population. Furthermore, Canada has a demonstrated technological expertise in its business products industry. With this as a base, further research, development and manufacturing of selected equipment would put Canadian companies in an excellent position. With this mind, the federal government, the Canadian Advanced Technology Association and others have called for a concerted, co-operative effort among the companies concerned, along with appropriate government support where needed.

With this co-operative, industry-government effort, Canada can be successful in capturing a good slice of markets. As The Economist said recently, "Most of the technological ingredients of the office of the future already exist. But few electronic companies have tried to fit all the electronic pieces together and pioneer paperless offices.

"The reason: none of the electronic office equipment manufacturers – not even International Business Machines Corp. of Armonk, N.Y., or Xerox Corp. of Stamford, Conn. – have succeeded in making the devices ' friendly ' enough that typical office workers (rather than computer people) can use them easily."

6

The
international
scene

There is a growing awareness among the industrialized nations of the world concerning the trend toward office automation and its economic and political implications. Many have invested in their electronic industries which will provide the technology base necessary to support the emerging integrated electronic society. Some have specifically stimulated their office automation sector – either as a national policy or in response to competitive market forces – with a view to taking a dominant position in the international office automation supply system.

Canada's major office equipment makers are mainly subsidiary operations of multinational firms. Most of these enterprises are rationalized, with the Canadian plants producing a limited range of lower technology gear for world market consumption. Canadian owned and controlled enterprises have a modest part of the domestic market, some producing highly innovative computer-based equipment. The automated office, requiring new skills and design concepts, provides an opportunity for Canadian industry to take a more advanced position in the overall office supply sector.

Canadian industry must participate in the office automation market in a world context, and it is vital that the competitive environment is understood. A report by the Telecommunications Economics Branch of the Department of Communications describes the industrial stimulation extended by several other countries. The report notes that many of these nations have adopted policies to encourage the growth of their own industries and to protect their domestic markets. The U.S., for example, uses tariff barriers to protect

the products of new technology until U.S. corporations are in a favorable position to compete on world markets.

As cited in the report, the countries most active to date include the U.S., Japan, West Germany, France, the U.K. and Sweden. Multinational corporations such as IBM, Xerox and a number of Exxon subsidiaries are already heavily involved in developing and marketing equipment and systems for the office of the future.

The United States

The United States is far and away the leader in the electronics and computer fields. For the past three decades, it has been at the forefront of research, development and applications of new technology in these fields. It is not as dominant in the area of telecommunications manufacturing however. Its present position of strength has been attained through government-sponsored research and development, a willingness on the part of its businesses to adopt innovation, the availability of venture capital and of extensive research facilities in industry and universities. Its ample domestic market has been fertile soil to develop innovative and effective computer-based products and systems.

Japan

Japan protects its industries with a highly restrictive procurement policy and with policies to limit foreign ownership of Japanese industry. For example, IBM's Japanese subsidiary must manufacture its most advanced products in Japan; it is excluded from government procurement; its share of the rest of the Japanese market is restricted; and it is required to license its technology to Japanese competitors. Japan has established multi-million dollar programs to develop and study automation based on a co-ordinated effort among its industries and government.

West Germany

West Germany is the leading producer of electronics in Europe. The West German government has undertaken a $600 million information technology program to run from 1980 to 1983. Its aims are to improve understandings of the social impact of this technology, to increase the country's capability in the skills needed to apply the technology and to support the development of the necessary communications systems.

German government policy is aimed at reducing dependence on foreign-owned subsidiaries in the electronics field and at supporting the development of electronic products for export.

France

Some of the measures taken by the French government to improve its position in the electronics market include a $625 million program to develop production and use of new products. The French government's policy is to encourage the expansion of its domestic industry, with emphasis on communications networks and services.

In an effort to challenge the multinational giants, a French company, St.-Gobain-Pont-a-Mousson, and Italy's Olivetti, have formed a partnership to develop electronic office equipment. Many other European companies are joining together in similar co-operative ventures.

The United Kingdom

In 1978, the U.K. government committed 100 million pounds for a three-year support program for its electronics industry and to encourage the development of new technology and its applications. The program also supported manufacturing and placed special emphasis on silicon chip technology. The U.K. government increased the emphasis on training and education concerning the social and economic impact of the microprocessor. It set up an awareness campaign to promote the incorporation of new technology into business and government activities. Nexos, an office information supplier, was established to co-ordinate marketing of office products developed in the U.K.

Sweden

Sweden's electronics industry specializes in the manufacture of bank terminals and telecommunications equipment. Computerization is already widespread in Sweden's industry, commerce and government. Sweden's government has placed a strong emphasis on the consideration of the social effects of new technologies and has tried to ensure that their application benefits all of its citizens. In response to union concerns, Sweden passed an act in 1976 requiring employers to negotiate with labor organizations before introducing major technological changes.

A government task force investigating Sweden's position in the computer industry concluded that the country was not large enough to support massive research and development programs. Instead, the development of a strong software industry and small systems production capability was recommended.

7

A
strategy
for
Canada

Canada needs to move quickly in the race for the office automation market. To do this, government and industry must work together in a co-operative effort to determine the best route for Canada to take. Because of the positions already taken by other governments and the developments already begun by their industries, these needs are urgent. As the federal Communications Minister said in November 1980, "The governments of other nations are assisting their high technology industries; we must do the same or be left behind." A multi-pronged attack on the problem is necessary in order to carefully examine all the economic and social implications of office automation on Canadian society, and to formulate effective strategies in the areas of industrial research and development and marketing at home and abroad to ensure that Canadian industry gets a significant slice of the office automation market.

Canadian industrial capability
Canada definitely has the capability of producing the office automation products and services that will meet the needs of domestic markets. We also have the capability to compete effectively on world markets. Canada has already developed expertise in several areas and on this expertise we must build, applying our knowledge of computer communications and other related technologies.

Canadian industry is competing in Canada with such giants as Exxon, Xerox, IBM, Wang and others. The financial resources needed to compete with these huge corporations are beyond the reach of

individual Canadian firms. These high costs – for research, development, production and marketing – hamper Canadian industry's immediate exploitation of the burgeoning automated office market.

Another problem facing Canadian industry is the shifting of market demand during the eighties from today's office products to tomorrow's automated products. Many of their existing products and services will become obsolete. Canadian telecommunication, computer and office equipment industries must adapt and start to make the necessary transformations now if they hope to be able to respond to the changing demands of the next 10 years. Most companies are now aware that significant adjustments are necessary and have started to take steps in this direction. Those without a strategy for the future will find survival increasingly doubtful.

The role of the Canadian government

The federal government has identified key areas of concern: the implications of new automated office equipment on the Canadian economy and society; the need for changes to regulatory, economic and social policies; the need for a significant Canadian presence in the supply of office automation products and services for the domestic and international markets; and the impact of expected product and service displacements on Canadian economic activities.

As the first step in the resolution of these issues, the government instigated a number of studies under the Office Communications Systems (OCS) program. The government contributed $200,000 toward these studies, and Canadian industry contributed another $200,000.

The findings from these studies provided:
– a knowledge about the user's product and service needs with detailed product and service specifications prepared by industry;
– a view of the domestic, U.S. and European markets;
– information on the competitive forces in the marketplace, most of their products and some of their market penetration strategies;
– knowledge of the strength and weaknesses of the domestic industry;
– the attention of our fledgling domestic industry, and their commitment to provide investment;
– the agreement of several companies to prepare business development plans in co-operation with the government;
– a knowledge of the potential institutional investors in the industry, their expectations and reservations.

In November 1980, the government Office Communications Systems program moved into a new phase when Communications Minister Francis Fox announced a $12.5 million program aimed at helping Canadian industry capture "a significant share of the burgeoning domestic and international markets for electronic equipment for the office of the future." The DOC program is to be complemented by the Department of Industry, Trade and Commerce's cost-shared programs such as the Enterprise Development Program and

the Special Electronics Fund, and through normal office equipment procurement.

In the first phase of this new program, government and industry will work together to develop office communications systems, to organize field trials, to map out a detailed industrial strategy and to conduct technological, behavioral, social and economic research.

On the same day, Mitel and Systemhouse, two of Canada's fast growing high technology industries announced that they would fund establishment of a Chair of Office Automation Studies at Carleton University. The two companies plan to put up $300,000 over three years. The move points to industry's readiness to work directly with universities to ensure they get people with the skills and training who are in increasingly short supply.

As well, 18 high technology companies, 17 of which are members of the Canadian Advanced Technology Association (CATA), are funding a study for a common approach to develop the Canadian automated office industry. CATA has also established a consultative committee with representatives from industry who will advise on industrial strategy for office automation and the committee's advisory services have been offered to government.

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Conclusion

A start has been made toward the development of the Canadian automated office industry, however, a great deal remains to be done. An effective program to put Canada on the office of the future map will require an unprecedented effort on the part of industry and government, and a willingness to work together in new and innovative ways. Government will have to adopt policies to encourage industrial support and to protect Canadian-made products. The social implications and human behavioral factors will have to be given more consideration than ever before.

Canada stands at a crossroads. If we act now, we can turn the opportunities that lie within our grasp into economic, social and political benefits for all Canadians. If Canada fails to respond to the challenge of the office of the future, the nation could face a $4-5 billion trade deficit in electronic products by the mid-1980s.