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# The Integrated Office: Tough Decisions Ahead



# The Integrated Office: Tough Decisions Ahead

## Many feet in the door

The promises come thick and fast. Your carpet is probably wearing thin from the stream of equipment vendors, consultants and office automation specialists, eager to show – and sell – the latest products or systems.

Everyone claims to have *the* solution for your needs. And if by now you've developed a tinge of skepticism about the whole business, you're not the first, and you're hardly to blame.

There are enough horror stories making the circuit to cause even the most sanguine executive to think twice: systems that end up not doing the job they were intended to do; cost overruns; disgruntled staff; incompatibilities; or systems which don't allow for expansion and future evolution as needs and technology change. We all have our favorites.

Nevertheless, office automation is here. And decisions will have to be made, if not now, then very soon, in most offices. The reason, in one word: *productivity*.

## The sorry state of office productivity

Studies show that office costs have risen precipitously over the past few years. Currently, "knowledge workers" outnumber production workers by about three to one. And while production has been steadily automated over time, the office has remained largely unaffected by technological change – at least until very recently.

Office productivity is difficult to measure, for it deals with information flow, decision making, efficiency, and, for lack of a better phrase, human synthesis – the way in which people work and communicate together. It's less tangible to pin down than, say, factory productivity, where costs and resources can be measured against the number of widgets coming off the line. Yet we all know, even if

only intuitively, that the business of offices – information – is becoming more complex as time goes on. Workloads increase relentlessly. Decision making rests on an ever increasing number and complexity of factors.

Some say that ultimately, the only good measure of productivity is the quality and timeliness of the information itself.

## Demand pull, technology push

Office automation specialists – and there are many now who have been through the ropes – see two major forces at work in today's office: demand pull, and technology push.

Demand pull is the search – no, let's make that the *need* – for better, more efficient ways to get on with the job of the office. Your competitors sense it. Your accountants know it. Your bottom line demands it.

At the same time, technological change is forging the productivity tools. It now becomes possible to vastly improve office productivity with the help of the new technologies. The microcomputer, the chip, innovations in systems and software, new telecommunications technology, and other advancements have given us a whole new productivity arsenal. Initially, these tools were directed toward

improving efficiency at the support level – secretaries, clerks, administrative assistants. And until recently, equipment spawned by the new technologies generally performed a single function: word processing; communications; financial services, and so on.

## Converging technologies

Now, however, we are witnessing a convergence of three technologies, which have, until now, been separate:

- office equipment
- computers
- telecommunications.

The convergence of these three technologies is the engine which is now driving the rapid developments toward the integrated office. One dramatic result is that we now have the ability to apply technology at the managerial level. And, in perhaps the most significant development of all, we now have the ability to integrate, cost-effectively, many major office functions in one system, accessible from a single workstation.



"Up to \$12 billion may be spent in the next 10 years to equip the nation's top executives with high-tech workstations."  
– Research report, International Resource Development, Inc.

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### The automated executive

Even a short time ago, common wisdom had it that automation was fine for the troops, and even for middle managers, but not for the higher ranks. Many a senior executive felt that the kind of work he or she did — meetings, negotiations, strategy development, financial and marketing decisions — did not readily lend itself to automation. Changes have a habit of coming fast, though. A new research study by Trinet Inc. shows that 35 per cent of top executives in the Fortune 500 companies personally use computers or integrated systems when making crucial business decisions, and 23 per cent use computers at home or on the road.

### The starting gate

Most senior executives approach office automation with three basic questions. What will it cost? What are the benefits? And how do I get started?

### The need for planning

"We'll give the secretaries a couple of word processors, and put a few PCs on the managers' desks, as a start." Frivolous as that sounds, we have found that many companies or organizations do not engage in the depth and type of planning essential for the move to the integrated, automated office.

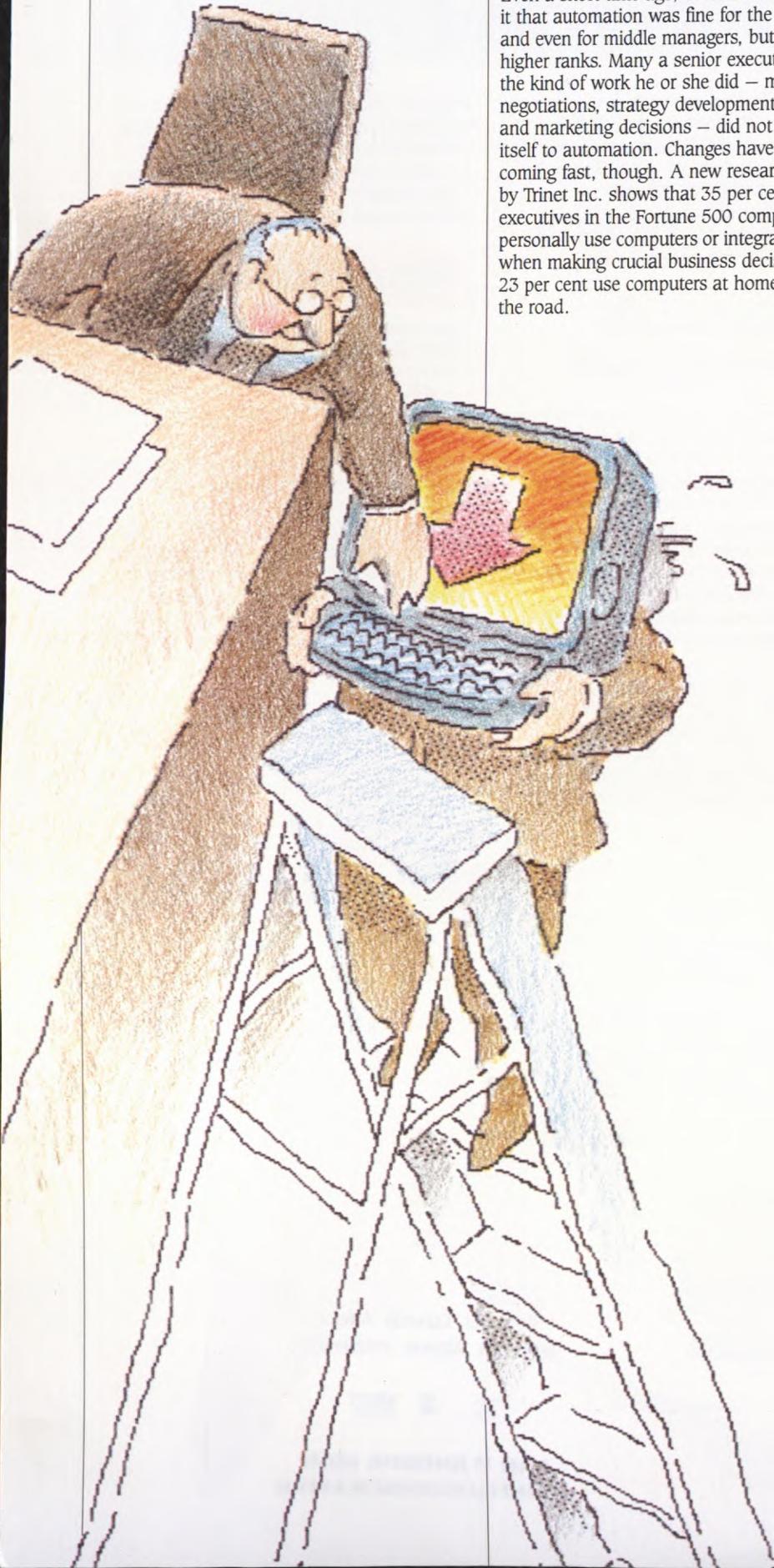
Often, the perceived complexity of office automation acts as a retardant to planning. "What's the use — it'll all change again in a few years anyway," is a common lament. Some companies put their faith in an equipment or systems vendor, as if the vendor has all the answers. Others may have developed an ingrained mistrust of "overplanning", a mistrust nurtured, perhaps, by past planning experiences. And still others leave the decision to section or branch managers — a chancy option at best, given the rapid moves toward system integration and the almost certain need for at least some of the equipment to be able to work together and communicate, if not now, then in the sooner-than-you-think future.

We are faced with a fundamental difference in the way technology has moved from individual tools to tools which serve the office as a whole — the office system. Here is what Tapscott, Henderson and Greenberg, authors of *Planning for Integrated Office Systems*, have to say:

"The new systems are much greater in scope than traditional computer, office or telecommunications systems. Because they have a social and environmental, as well as a technological component, they deeply and profoundly affect the nature of the organization. Planning is essential to ensure that changes required to all three components of the work system are anticipated, and that all three are combined in the best manner or 'jointly optimized' for maximum organizational performance."

John J. Connell, Executive Director of the Office Technology Research Group in Pasadena, California, puts the issue of planning starkly:

"In a world where technology is becoming a significant factor in the workplace, the need for strategic planning is paramount."



## Who's in charge?

The responsibility for these three converging technologies has traditionally resided in separate areas — at least in larger organizations. Computing resources generally fall under EDP managers; telecommunications under its own responsibility centre, and responsibility for office equipment often lies within the administration branch. No matter how good your experts are in each of these fields, they may not have the knowledge to plan an integrated office system. Since office automation is a new area of expertise, it requires a new breed of expert.

## Who are the best planning experts we can find?

When we talk of office automation, we aren't talking about equipment, or even systems. At least not at first. We're talking about *your* office. What you do. How you work. Your management philosophy. Your lines of communication. Your managers. Your staff. Your working style. Your productivity. Your organization. Your business strategy. Your procedures. Your budget. Your hierarchy. Your need for efficiency. The physical environment of your workplace.

No outside vendor; no systems consultant; no office automation specialist will ever know your office the way you do. By all means use them. Take advantage of the expertise that's out there. But remember where the planning buck stops. Experts advise that you assemble a multi-disciplinary team which includes computer systems, applications, and communications specialists, with overall responsibility at the senior management level.

## Top down, bottom up

Some of the most successful office automation systems begin with both top down and bottom up planning. The commitment of senior management is a prerequisite. A recent Woods Gordon survey of office productivity says, point blank, that the success of any productivity improvement program depends largely on the commitment of senior management.

But equally important is the participation by staff and workers at all levels. Some of the best office automation plans — on paper — have

failed because of lack of consultation and input from those who would be using, and those who would be most affected by, changing technology. A lot of ink has been spilled recently about the negative effects of office automation, particularly on people and the quality of working life. But it need not be so. Those organizations which bring into the planning process managers and staff at all levels, which take the time to involve the office worker, and which foster a sense of contribution at all levels, are the ones which have chalked up the greatest office automation successes.

## A process. Not a product

Office automation can best be described as a process, not a product. It will evolve and change over time, as your business evolves and as the technology itself changes. An office automation plan cannot be viewed as a once-and-for-all solution, a neat package cast in concrete and stamped by the CEO. Ideally, it should allow for expansion, and for future growth or change; it should be able to take advantage of whatever technological and software goodies come down the pipeline; and should be flexible enough to change and adapt as you do. Charles Darwin, of course, discovered that life itself works in exactly the same way — at least for those of us who survive!

## A major investment

As necessary as office automation is becoming, it is also a very expensive investment. Depending on the systems; costs of equipment, software and training can run at \$10,000, \$30,000, or even more, per workstation. For many companies, office automation will represent one of the major investments of the 1980s.

## Where to begin

Obviously, it is impossible to automate all of the offices in a company or organization at once. The idea of a terminal on every desk is still a futurist's dream. So where to begin? The word from many experts is to start with a pilot project. The pilot approach is invaluable, for it allows, at reasonably modest risk, the testing and performance evaluation of a system, the assessment of user reaction, and the refinement of features and system architecture before committing to major investments. It is also recommended that the pilot be in an area of the organization which can withstand the inevitable learning curve associated with office automation. Usually, a newly-automated office will continue to function with both the former, paper-based system as well as the new system, until bugs have been ironed out and the reliability of the new system has been assured.

Armed with the lessons learned from the pilot, an organization can then begin spreading the automated systems to other areas. Many experts recommend automating those operations which would benefit most from the new technologies and which are the most critical to your success as a company, or to your value as an organization.

## Don't automate your mistakes

One of the lessons learned by companies which have automated — and a painful lesson it's been — is that a branch or division which is poorly managed, or in which there is lack of communication, is not likely to be saved by a computer. The reverse may in fact occur. Automation may compound managerial weaknesses.

Most automated offices show an initial productivity decrease as staff familiarize themselves with the new techniques. However, studies have shown that the productivity of offices which are well managed will improve after automation, and will continue to do so over time. In poorly managed environments, productivity may improve in the short term, but peter out over the long haul. Translation: automate your well-managed areas, and clean up poorly managed sectors or branches before submitting them to the new technologies.

**"Computers will never replace office workers until they learn how to gossip"**  
— Anonymous

## No need to integrate? Then don't

It's common sense, we suppose. But if your marketing department hasn't talked to your production plant in Houston once in the past five years, and doesn't need to, avoid the tendency to install a Cadillac system which allows full function communications and document transfer between the two shops. We've overstated the case, perhaps. Suffice to recommend that you examine the way communications, decision making and information transfer occur now, and tailor office automation systems to enhance those which are important.

## Training – the key to success

Despite the din about user-friendliness, the new technologies are not easy to learn at first. True, some people take to them like ducks to water, but many others may be intimidated by their apparent complexity. Training has become one of the major issues in office automation and its expense is often underestimated.

An issue which relates to training is motivation. Unless staff approach automation positively, the experiment will not succeed. Training usually involves both group and one-on-one sessions to familiarize staff with the system, its applications, and its features. Handholding is another crucial step. Many successful office automation projects include "roving experts" – a kind of technological uncle – who are never far away at the outset and who can pry users out of the "command jam" that all first timers experience.

They can help staff become more productive more quickly.

The need for well organized, easy-to-follow manuals goes without saying. In selecting integrated systems, ensure that they have well organized on-screen help features as well.

## Evaluation

Evaluation is a critical component of the office automation plan, for it is through a continuous assessment of such factors as systems, features, usage, productivity, morale, motivation, quality of working life and other factors, that automation can successfully evolve.

## Vendor selection

The hard part. Vendor selection should become, in part, an issue of corporate policy, for a number of reasons. First, the cost alone represents a significant capital investment. Second, selection of the technology itself will have important ramifications for the corporation or organization as a whole. Third, as technology increases in importance, the decision to select a vendor or a number of vendors becomes increasingly tied to the success of the enterprise as a whole. Fourth, end user departments usually do not have personnel expert enough to make the right choice. And fifth, it may be unwise to leave the choice entirely to section or branch managers, because of the need to ensure compatibility, where necessary, throughout the organization.

Some companies, fearful of the computer and office equipment company shakeouts that are occurring, will make conservative choices, sticking with mainline vendors. But many office automation experts agree that this is not always the wisest choice. Often, mainstream vendors simply do not have the most appropriate products to meet specific or anticipated needs. Many companies are discovering that even the largest vendors may not have the answer to their particular requirements and are increasingly shopping the market to find what they want.

## The Canadian approach

A number of Canadian companies have developed office automation solutions which meet the concerns of companies or organizations wanting the assurance of equipment manufactured by leading suppliers, while at the same time meeting the need for versatile, flexible systems, tailored to the requirements of the user. In many cases, Canadian solutions include equipment by, or compatible with, major North American suppliers. And for specialized purposes, Canadian companies have developed operating systems and software that have become the choice of many large corporations and institutions. Often, these have been designed to fill particular office automation "niches", which have been overlooked by other suppliers.

But the key lies in the ability of these companies in office systems design. If anything, their product is *integration*, even though the various pieces of hardware used to build the system may be the products of leading hardware manufacturers. The emphasis, in system architecture and design, is on an open approach, which recognizes the need for systems to evolve and expand.



"A knowledge worker is someone who, when you pass by his office and see his feet on the desk, you can't be all that sure he's not working."

– Anonymous

## No man is an island

Picture a remote archipelago in the South Pacific. Palm trees. Isolated islands. In the past, office automation decisions have tended to take place as if people in the office were a series of these islands. Each island – person – had a function to perform and, if he or she were lucky, was given productivity tools to help. It may have been a word processor. Or a PC for personal productivity.

The trouble with isolated islands is that the mail boat only comes around once a month. And the trouble with the island metaphor is that it does not represent the way an office works. An office is a team. People sharing. Working together. Meeting. Brainstorming. Gathering information. Analysing. Making decisions. Communicating. The office is not just a collection of individuals. It's a *system*. Each office has developed unique ways of managing information and people – its own culture. And the newest trends in office automation point to the fact that technology must not only work to improve personal productivity, but, above all, to improve *system* productivity. And now, the technology has advanced to the state where it becomes possible to automate myriad functions designed to improve both personal and system productivity.

It is in precisely this area – system integration, based on powerful new computer communications technology – that many Canadian office automation companies have become recognized as leaders.

## Converging technologies

Three traditional technologies are converging to provide the engine for the automated office.

### Then

**Office technology** – Traditional offices included standard equipment such as typewriters, copy machines, paper-based systems, microfiche, as well as adding machines, dictating machines and others.

**Telecommunications** – At one time, telecommunication was restricted to the telephone, private branch exchange and telex machine.

**Computers** – Traditionally, computer technologies were comprised of data processing machines, mainframe computers, control systems, storage devices and output devices, such as printers.

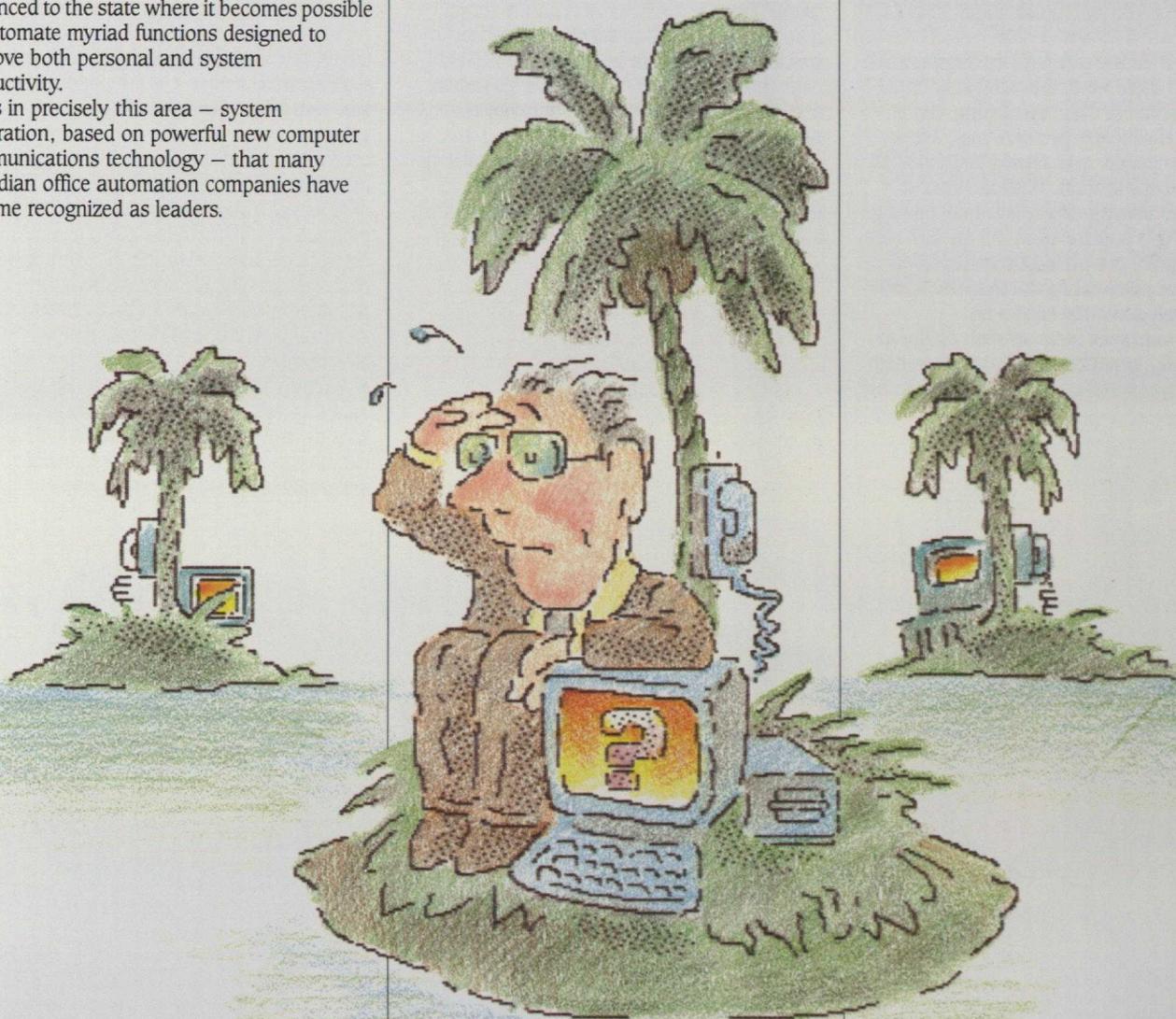
### Now

**Computer and communications** technologies have converged to produce distributed data processing, intelligent switching devices, local area networks, electronic mail, voice and data systems, videotex, and other systems.

**Computer and office** technologies have converged to provide calculators, word processors, office computers, and smart copiers.

And **office and communications** technologies have converged to provide smart telephones, communicating copiers, electronic filing, facsimile and teleconferencing.

Now, all three are converging to provide such tools as computer-based messaging systems, portable intelligent terminals, voice, text, image and data storage, external gateways, intelligent PBXs, "smart" LANs, and the integrated workstation.



## The PC pendulum

There are some interesting and revealing trends when we look at the personal computer and its sudden invasion of the office.

Remember the old days? There was your environmentally controlled white room, with a wall full of data processors silently spinning through the corporate database, and guarded by technological high priests. The PC democratized the computer, and put its power onto individual desks. And they are great machines for personal productivity. If the earlier technologies spawned too much centralization, the PC pushed the pendulum the other way. Some say, too far. So now we're seeing the pendulum swing back again.

As a result, the latest trends in PCdom are away from the stand-alone unit, to systems which network, multitask, and allow for messaging or for document transfer.

### So what about the PC?

What should be the policy of the organization toward PCs? Here we find several schools of thought — some of them conflicting. Some say the PC is simply a personal tool, like a calculator or pencil, and should be treated as such in the organization. With the cost of stand-alones coming down, this may become an increasingly popular view. Others say, sure, let's not deprive our managers and staff of cost-effective personal productivity tools, but let's also look down the road a bit.

As these machines increase their ability to communicate, to perform many tasks, to help in the decision making process, to tap into the

mainframe, and to share peripheral resources such as printers, PC policy should at least bear in mind the developing trends, and the potential for integration. It may come, but at the moment, different PC models and brands are difficult, if not impossible, to link together.

### No single solution

Experts — and there are no exceptions here — will never recommend a single machine, or even a single equipment vendor, for all the workstations in an organization which has many different branches performing many different tasks. The logic is simple enough: a machine which may be ideal in your number-crunching accounting department may not be worth a hill of beans in the art department.

And the same goes for PC software. A package which blisters through reports under the flying fingers of a 120 word per minute typist, may be an anathema to the executive who only taps out a couple of letters a day and who may as well learn Sanskrit than break through the command codes. Likewise, off-the-shelf products from the popular software houses may be ideal for many purposes. But not necessarily for all. If you have specialized tasks, you may need specialized, or proprietary software. Round pegs have never fit into square holes before, and the last time we looked, that law of physics hasn't been repealed.

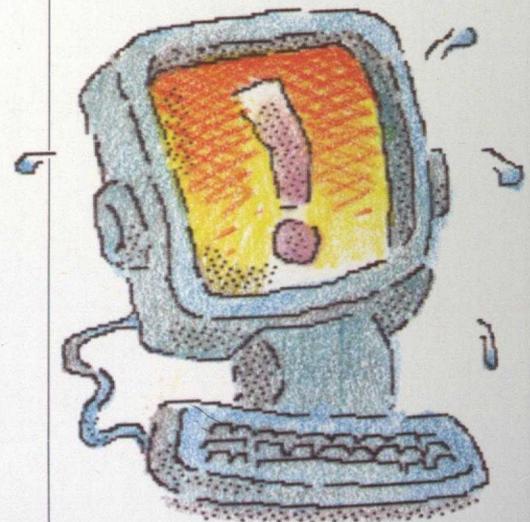
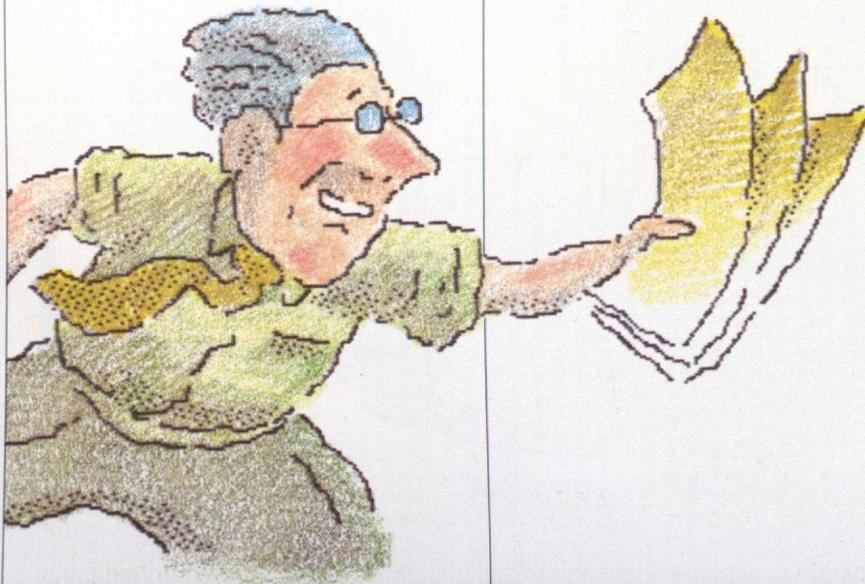
The ancient proverb — define your tasks, find the best software, then select the optimum machine to run it — still stands, even as office automation moves toward office integration.

## The integrated workstation

From the user's point of view, the integrated workstation may not look much different from the same old screen and keyboard combination we've seen popping up on desks over the past few years like mushrooms after a rainstorm. But when the system is "powered up", as we're fond of saying, we begin to see the capabilities.

Let's take a look at a state-of-the-art integrated work station. We'll forego a technical description at this point, in favour of explaining what it's like, and what it can do, for the person sitting in front of it. Note that no single system will incorporate all of these features, but most are available now, in various combinations.

- **Full PC power** — Many integrated work stations are built with full PC capability on site. This means that anything a PC can do, can be done by these integrated units. Most vendors ensure compatibility with dominant PC systems so that the thousands of popular software packages on the market can be run. As with any PC, these may have local disk drives, for complete control by the user.
- **Central file server** — Most integrated systems link individual terminals to a central file server. This can contain all of the most commonly-used software packages which can be downloaded to each terminal when needed. Instead of requiring a copy of a word processing program for each terminal, for example, a network version can do for all, with obvious cost savings. The file server also stores documents, corporate files and other work at a central location, again accessible by all terminals.
- **Friendly interfaces** — Most integrated systems are getting friendlier. Menus, help screens, tree structures and icons are among the devices which are helping to make integrated work stations easy to use.



- **Word processing** – Obviously. But many systems now combine sophisticated spelling and grammar checkers, thesauruses, pre-set forms, multiple addressing, and boilerplate insertion features. Choices can be made between full function programs for heavy scribes, and simplified versions for the occasional memo or report writer.
- **Database management** – These programs, which organize information in a way which can be easily analysed, cross referenced and retrieved, can be as simple as a mailing list, or as complex as an inventory control system, depending on needs.
- **Spreadsheet** – These are the standard workhorses for financial analysis, what-if scenarios, budgets, and general number-crunching.
- **Calendaring** – Integrated calendars are much more sophisticated than the word implies. In addition to helping with personal agendas, or automatically reminding you of meeting times or your spouse's birthday, the integrated versions allow for such things as automatic scheduling of meetings. You want to meet Joe and Martha next week? The computer looks at their respective schedules, sees when both are free, and automatically schedules a meeting time.
- **Electronic messaging** – On networked systems, electronic messaging is turning out to be a major systems productivity tool. Avoiding telephone tag, written messages can be created and sent to one person or many, and distribution lists for messages can be kept on automatic file. Privacy and confidentiality features are usually incorporated. If you have a message waiting, most systems will alert you automatically.
- **Electronic mail** – Access to commercial E-mail services through the workstation is often possible in integrated systems.
- **Document sharing** – Any information created by you or by others on the system can be retrieved by anyone else, unless marked confidential or for certain eyes only. You may also indicate which other users, if any, have the right to change a document you have created, or which can view it only.
- **On-line research** – Most integrated systems allow access to the rapidly proliferating public databases which provide research material on almost any subject available. Because these services tend to be expensive, there is usually some restriction over which workstations have access to these public resources.
- **Mainframe links** – Most integrated systems allow the user to retrieve data from the company's or organization's mainframe, and even use tools such as a spreadsheet program to analyse such data locally.
- **Windows** – Windows will allow you to look at two or more functions at once and transfer data among them.
- **Electronic desk** – A catch-all phrase for a number of automated personal productivity tools, normally found on the pre-workstation desk, such as a calculator, note pad, personal file space, telephone number list, agenda, clock, alarm reminder and so on.
- **Automated telecommunications** – Some workstations incorporate features such as automatic dialing, call forwarding, the ability to send and receive both voice and data through the same system, and other telecommunications features.
- **Voice mail** – In voice mail systems, now becoming more popular, the sender merely speaks into a telephone. The message is digitized, stored and distributed to one or many other voice mail terminals. It's fast, avoids wasted time through telephone tag, and does away with the need to type out messages.
- **Document approval systems** – An important feature for some organizations, where documents have to go through many approval stages and be vetted by many people as they work their way to the top. Document approval systems support automatic forwarding of documents for approval, signing off by managers before they reach the next stage, monitoring of the approval process, tracking documents, and record keeping.
- **Videotex** – Workstations which incorporate videotex technology can both create and access high quality graphics and text, either from commercial videotex databases or specialized services such as those which provide stock market reports and trends, or from the company's own videotex database.
- **Bilingual capabilities** – Some integrated systems are user-friendly in more than one language. In these, a person indicates at the very first prompt, whether he or she wants to perform tasks in, say, English or French. From that point on, the system responds in the language chosen.
- **Artificial intelligence** – Although we've heard about artificial intelligence for some time now, it has only recently begun to become available to office environments, in the form of "expert systems." Essentially, an expert system is a complex program which can "learn" critical aspects of an operation, process or subject field. Users can then query the system, often in a "natural language". Watch for rapid developments in AI over the next few years.
- **Shared Peripherals** – Standard peripherals such as printers, plotters, etc. are included with integrated systems, and in many cases, peripherals may be shared by several workstations.



# The Office of the Future — Here Today

## A Canadian success story

The long-awaited office of the future is here.

Over the past three years, a number of Canadian companies have co-operated in a massive program to develop and test integrated office systems. Now, these are in place, operating at locations throughout the country. The lessons learned through the program have resulted in state-of-the-art integrated office systems, a highly-competitive Canadian office automation industry, and some of the most thorough research on the use and effectiveness of these new systems to be found anywhere.

## Hundreds of integrated terminals

Under the program, a series of large field trials was launched in federal government department offices, in which integrated office systems were installed in several organizations involving hundreds of staff at all levels, from support personnel to the highest levels of management.

The program, known as the Office Communications Systems program, was co-ordinated by the federal Department of Communications and involved the participation of office automation companies, users in federal government departments, and teams of researchers.

It was designed to develop, use and evaluate integrated systems, on which the office worker, at a workstation, could perform a wide range of tasks, including word processing, electronic messaging, analysis, document sharing, teleconferencing, remote database access, storage and retrieval, high quality graphics communication, and others.

The \$12.5 million program was designed around five major office automation sites, each requiring the kinds of automation techniques most offices could benefit from, yet each setting unique. The mix of sites involved offices with different types of administration, policy making, office practices, management philosophies and communications channels. Some involved integration of operations in a single location, others involved integrated links between headquarters and field locations.

The organization of the field trials was a patient matching process between suppliers and users. Industrial representatives had the opportunity both to study the needs of departments selected for the trials and to present their approaches to automation.

The lessons of the program indicate that there is tremendous potential for improvements in office productivity through the new integrated systems. At the same time, they provided an invaluable opportunity as a learning process. As a Department of Communications report on the program concludes, the success of the trials "will not depend on problem-free progress, but on the clear identification of promising equipment and systems and the equally clear identification of pitfalls to avoid and of problems left to solve."

Clearly, the trials have been of tremendous benefit to participating Canadian companies. For the first time in history, the development of major systems has been able to proceed hand in hand with their use in live settings. Most technological and equipment development takes place in company R & D shops, far removed from the end user. "It was this synthesis between system development and actual use that was the key to the program's

success," according to André Dubois, manager of the OCS program.

The experience of the field trials has positioned a number of Canadian companies as international leaders in the new technology of office automation. Already, the benefits of this experience are resulting in a rapidly expanding awareness of, and interest in, the Canadian approach on the part of companies and organizations looking for office automation solutions.

Mr. Dubois said that the development of office automation products by suppliers to the trial projects was based on a very close relationship between the designers of the technology and the users. "The trial experience provided the vital missing link between R & D and commercialization," he said.

Besides the success of the field trials in the development and use of new integrated office systems, the program provided a living laboratory to assess the impact of new technology on working conditions, employment patterns, performance, worker response to technology, and job content.

The following articles describe the office of the future trials in more detail.



## Plugging in the Knowledge Worker

One of the most comprehensive of the five office automation field trials under the Canadian Office of the Future program, was launched in June, 1984 after almost a full year of planning.

The site chosen was in the policy sector of the Department of Communications, an organization responsible for initiating, studying and analysing major policy issues in the Canadian telecommunications and broadcasting environment. Seventy-six intelligent workstations were installed, but not all of them on the desks of staff or middle management. Terminals also sprouted on the desks of senior managers in the department.

The planning was thorough. Mary Meloshe, director of the trial, said that for the first time, planners and users took a hard look at how information is actually created and communicated through the organization, a necessary first step. "Most vendors and systems suppliers don't understand how large organizations function," Ms. Meloshe says. "Indeed, managers themselves are often unaware of the intricacies of the process, since so much of it is usually carried out by support staff. As a result, it is rare that off-the-shelf equipment or systems can meet organizational needs entirely.

"One of the most satisfactory results of the planning process was watching how user requirements influenced the evolution of the specifications of the system," Ms. Meloshe says. "Canadian equipment suppliers learned first to examine the organization and flow of information, and to rely on the expertise of knowledgeable people in the office itself, before tailoring system architecture to user needs."

A particular requirement was for full bilingual functionality, since it is a matter of Canadian government policy to provide services in both English and French, the official languages of Canada.

Comterm, Inc. of Pointe Claire, Quebec, a major Canadian high technology company, was chosen as the supplier.

### System architecture and functions

In brief, the system architecture looks like this: Each of the 76 workstations, IBM compatible personal computers manufactured by Comterm, has 640 K local storage and a disk drive and is equipped with a bilingual keyboard. They are linked by a local area network (LAN) to two file servers which store central applications software and corporate files. Each server has 137 mb storage facility. The system is menu driven, and a user selects English or French at the first prompt. From that point, all functions and "talk-back" are in the language chosen.

Functions include:

- text processing,
- spreadsheet programs,
- file management, including user definable files, and the ability for more than one person to work on a single document,
- personal productivity software (any IBM compatible software will operate at any terminal),
- Messaging, in which a user can send an individual message to any other terminal, create distribution lists for messages, attach documents, and ensure confidentiality,

- Graphic communications, using Canadian-developed Limicon videotex software, for the creation and display of videotex text and images,
- Document and task management, which supports document tracking, approvals, BF (bring forward) and statistics-keeping for correspondence, a feature particularly important, given the nature of the organization,
- Calendaring. The ability to automate the scheduling of meetings by computer met with some user resistance (those who wanted the choice of when they would be available for meetings left to them, rather than the machine) and was abandoned in favour of a more simple electronic calendar/agenda function,
- Electronic archiving, which supports information storage and retrieval,
- External communication to public databases (restricted to certain terminals only),
- Text transfer with AES word processors.

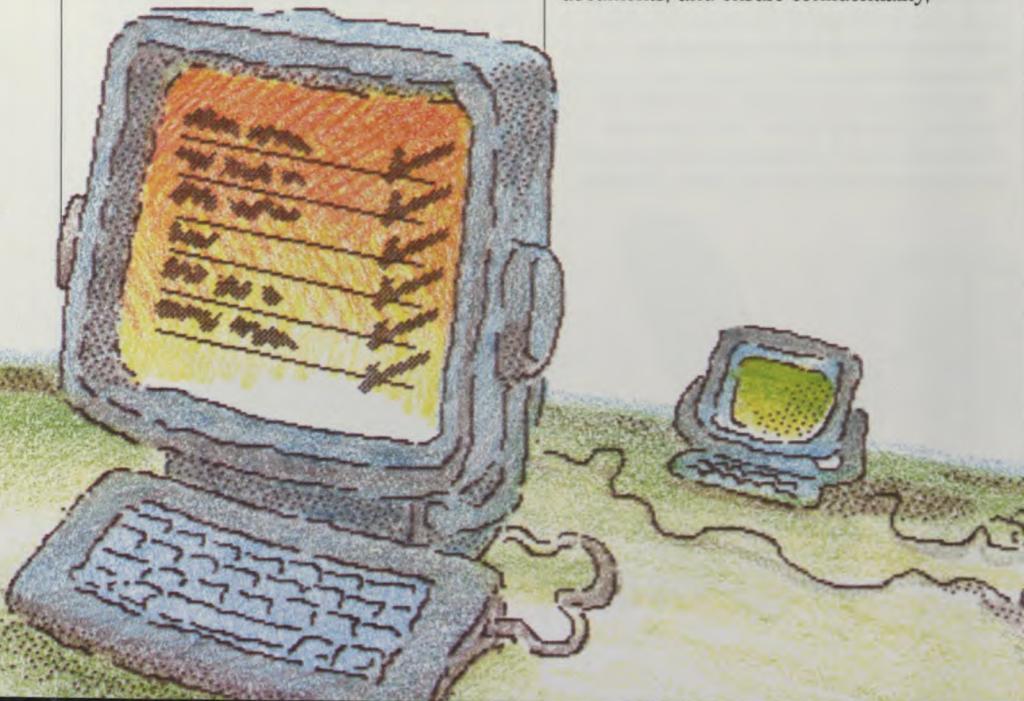
Ms. Meloshe reports that user acceptance is extremely high, with average terminal use in the core group of users running between four and five hours a day. Word processing, spreadsheets, messaging and archiving seem to be the most frequently used features, but one of the most valuable has turned out to be the document and task management feature. Essentially, it supports a traditional document routing and approval process which had been well-established in its paper-based counterpart, mirroring the existing way in which information was managed. "It's when one sees the success of this kind of feature, that one realizes the tremendous advantage of knowing precisely how the organization manages information, before designing the system," she says.

She attributes the positive attitude on the part of users to the degree of consultation, training and user support provided. Although several people had used terminals before the system was installed, keyboard skills were generally non-existent, and there was a certain amount of apprehension. Training took the form of workshops and peer group sessions, and one-on-one sessions for senior managers. Experts were also available to help users at their workstations.

"One of the things we discovered when we began is that everyone was new to this field. We kept coming across major issues, the significance of which we didn't realize at the outset, such as office layout, physical installations, acoustics, wiring, lighting requirements — the list is a long one.

"The trial itself was precisely what it was intended to be, a learning process, whereby both the organization and the system supplier were able to grapple with and solve some of the major office automation issues."

Ms. Meloshe says that the keys to success were the high level of user support and the high degree of commitment from senior management at every step, "something which is absolutely necessary in a major program of this nature."



## An Environmental Approach

In one of the largest of the Office Communications Systems field trials, 155 integrated terminals were installed in offices of Environment Canada, a federal government department concerned with regulations and policy with respect to the environment.

The trial was implemented in two phases. In the first, 71 terminals were installed at the department's headquarters in the nation's capital. This was later expanded with an additional 84 terminals in locations 2,500 miles away, in Calgary and Jasper, Alberta. Users of the system were mainly managers and professionals, the so-called knowledge workers.

The chosen system supplier for the trial was OCRA Communications, a growing Ottawa, Canada company specializing in the new office automation tools. Such functions as electronic mail, word processing, spreadsheet, database applications and electronic filing were woven into the system and made accessible by each workstation.

The prototype tools, both powerful and easy to use, facilitate the routine aspects of daily office work and allow for more challenging elements of a job to be treated more efficiently.

John Smith-Windsor, manager of the trial, said the phased approach was an ideal approach for a venture of this magnitude. "The first phase was intended to allow us to study and assess the use and functionality of the system in a relatively controlled setting. The lessons we learned were then applied to the expanded trial." Such issues as how the system was being used, where difficulties occurred, and the need to refine training procedures, were analysed, and then fed back into the planning and system design process.

For example, the way in which the system is presented to the user, or the user "interface", evolved after close work during the first phase. The challenge for OCRA was to design an interface which allows experienced workers to work quickly and efficiently, while at the same time providing for the novice user. Most system designers face this problem. A menu driven solution is ideal for the first time user, for it leads him or her patiently through the process. But it tends to be slower than a system which allows the use of function key commands to directly instruct the system to perform a particular task. OCRA chose a function key approach rather than a menu driven approach, but backed it up with an extensive, on-screen help system. No matter where a user is in a program, by calling up a help screen, he or she receives precise instructions as to what to do next.

Mr. Smith-Windsor said one of the most significant results was the degree to which staff in far flung regions of the country now felt "intimately plugged in" to the organization. "Many of the problems of communicating over

long distances — telephone tag, delays and wasted time — virtually disappeared overnight."

The value of a feature such as electronic messaging obviously depends on the number of terminals, as well as on the levels and functions of those people who are connected. "With 155 terminals, and with proper care in the choice of staff who were equipped with workstations, we were above the 'critical mass' necessary to ensure a well-used, productive system," Mr. Smith-Windsor said.

Experience in installing one of the largest systems of its type has helped the OCRA team of professionals become experts in the area of office automation. This expertise is offered to the market in the form of systems integration services encompassing hardware, software, communications, training and support, and office automation consulting. As well, the integrated office system developed and tested during the field trial is now being marketed under the name *Colleague*. George Arkeveld, Executive Director of OCRA said, "The pilot and field trial have been invaluable to the development of *Colleague* in that there is a significant difference between what a programmer would like to see in a system and what the user requires.

"The pilot and field trial have therefore given a product which is developed by users. In the competitive area of office automation software, this user involvement will give us the winning edge."

## The Best Defence

Canada's Department of National Defence, the site of one of the Office of the Future field trials, has implemented its integrated office system in the financial services area of the department.

The trial began in October, 1982 with an extensive planning phase. Interviews with middle and senior management and extensive questionnaires were used to help in planning

and systems design. By 1984, initial hardware was in place, supplied by the Canadian-owned XIOS Systems Corporation.

The Department of National Defence office automation trial is using a unique integrated system from XIOS known as *Renaissance*. *Renaissance*, based on the UNIX operating system, integrates non-communicating office products and systems into a single network which can be used to communicate information. At each workstation, users can create and edit documents, send and receive messages, and distribute and share correspondence with others. It also features a calendar, and allows for access to other systems such as internal and external databases. Each *Renaissance* node can accommodate up to 20 users and peripherals, and is capable of supporting a variety of personal computers, such as IBM, Wang, Displayphone, terminals such as the DEC VT 220, as well as word processors and printers.

As with some of the other trials, an initial decision was made to implement the system in a phased approach. In its final phase, the system will include up to 130 terminals at the headquarters offices in the nation's capital, and in Winnipeg, 2,000 miles away.

During 1984, an initial pilot system was configured and installed. An in-depth evaluation of system performance and user reaction was then fed into the planning process and to XIOS for an expanded version of the system.

Maj. John Macko, Manager of the DND trial, says that it is important for organizations first getting involved in office automation to begin with a small pilot, before implementing a large system. "The pilot is invaluable, for it can be used to evaluate system architecture and functions, to gauge reaction and acceptance, and then to use the results of that evaluation to help design an expanded version."

"An important issue is training, Maj. Macko said. "We found that at the outset, there are varying degrees of computer literacy, and training courses have to be made flexible to accommodate different skill levels and different learning speeds. Handholding, particularly at the outset, is a feature which should be built into the training cycle."

During 1985, the pilot system will be expanded to full operational status, and the system will evolve to include additional terminals both at departmental headquarters in Ottawa and in regional offices in Winnipeg, Manitoba.



## The Electronic File Cabinet

Someone once said that policies, procedures and regulations are the grease of government. They are also a major administrative headache. Policy manuals, directives and procedures are constantly changing, and there is a corresponding need for sophisticated systems to ease the burden of revisions, filing, retrieval and management.

In a unique office automation field trial, the Canadian Department of Energy, Mines and Resources has applied new technologies to help solve the problem of quick access to about 20,000 pages of administrative manuals, circulars and internal memoranda.

The system, now in place, features a software approach, designed by Officesmiths Inc. of Ottawa, which can run on standard microcomputers. Called OfficePolicy, it allows for rapid access and retrieval of documents and information stored electronically.

At the workstation, users can perform word processing and text editing, forms processing, and personal filing, as well as linking in with the document management system. The workstations are MS/DOS personal computers which have access to the departmental information systems, corporate computer centres and outside databases.

There are three phases in the trial. The first, completed in early 1983, produced a feasibility study and implementation plan, including a prototype of the four major software components of the Officesmiths system.

In the second phase, completed by September 1983, a pilot program for the automation of administrative manuals was implemented, which allowed project management to evaluate both hardware and software, as well as user response.

The department reports a significant saving in the time required for staff to access, consult and interpret administrative documents. Officesmiths designed its software to meet the specific needs of the trial, but says it is applicable to almost any area involving the automation of policy and procedure manuals and documents.

Mr. Dan Normandeau, project director for the EMR field trial, says the pilot project "showed that the software developed for the system was entirely satisfactory and I am looking forward to evolving the system to the point where all information management systems in the department will be integrated."

This will begin in the third phase of the trial, which is being implemented during 1985.

## Less Taxing?

At the Canadian Department of National Revenue, Customs and Excise, an integrated electronic office system has been developed by Bell Northern Research, a large communications research and development company and part of the Bell Canada, Northern Telecom family.

The system provides electronic messaging, advanced telephone service, conferencing, personal filing and report production for 100 workstations (48 in Toronto and 52 in Ottawa), largely in the Tax Interpretation and Special Audit sections of the department. The BNR system, known as the Integrated Services System (ISS), is designed primarily to facilitate communications.

The workstations include Displayphones for managers, and video display terminals with SL-1 telephone sets for knowledge workers and support staff. The Displayphone is a unique integrated telephone and data terminal. Connected by an SL-1 PBX switch, it can access remote host systems and permit electronic mail and messaging. The equipment combines

voice, text and data in ways which allow employees to communicate with one another and get information easily. One aim of the trial was to test functions that tend to be similar in most offices, so that the systems will have the widest possible application.

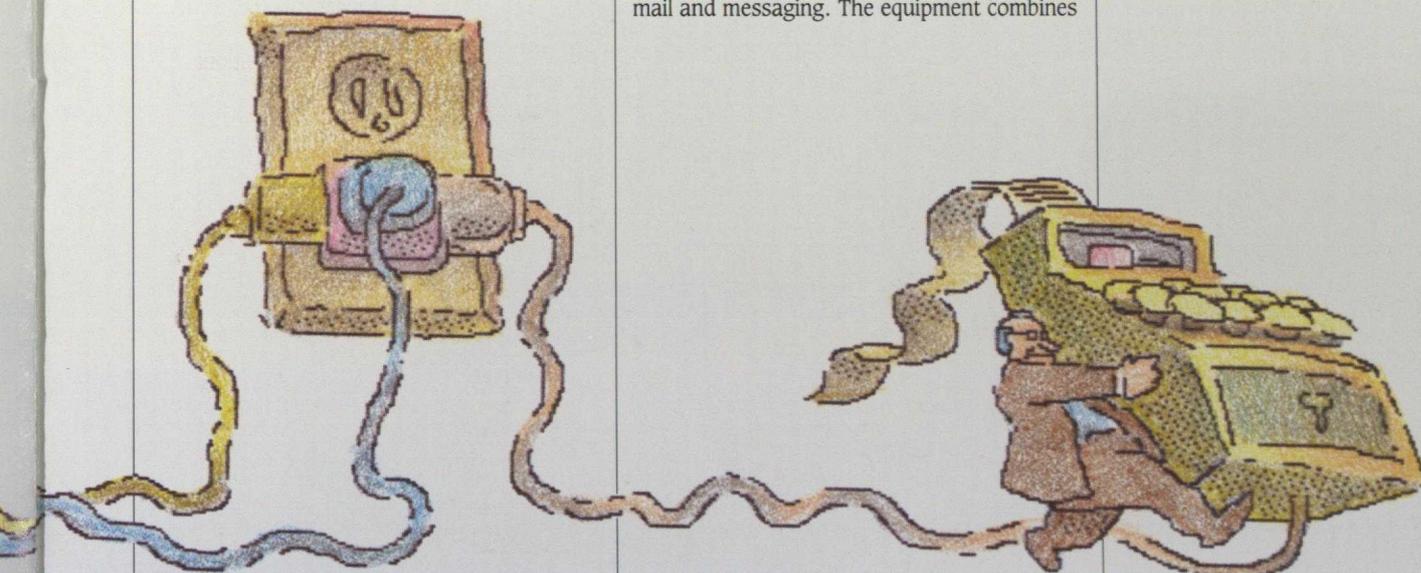
At the workstations, documents can be created, transmitted, filed and retrieved. The system has dramatically improved "document productivity", the time it takes to create, route, modify and circulate text information. And since the system links voice, text and data at a single workstation, staff can discuss files on the phone, with visual information displayed simultaneously.

A centrepiece of the field trial is the use of the system for tax interpretation. The Excise Tax act, which the department administers, is a complex body of regulations. Several thousand tax rulings have been placed on the QUIC/LAW computer system in Kingston, Ontario, and can now be searched by keywords through the equipment provided by the trial project. Although still in the testing stage, the system promises to improve service to the public and to assist in the complex job of interpretation.

As with all knowledge workers, staff at the department deal with an ever-increasing body and complexity of information. And the system is helping place automated productivity technology into the hands of the decision maker, analyser, project manager and report writer, people who until now, have not had the benefit of office automation tools.

Project manager James Commins says the focus of the trial "is not so much on automation itself, but on how knowledge workers at various levels can use new electronic technology to improve their effectiveness through better communications and access to information."

Mr. Commins said because the results of the trial have been "very positive," plans are already underway to expand the system, linking managers in departmental regional offices across the country into the integrated network.



## Why consider a Canadian company as a system supplier?

The selection of an office automation system supplier is one of the most important choices facing companies and organizations in the 1980s. A number of Canadian companies have emerged as leaders in office automation. The following factors show why their products and services should be seriously considered by organizations about to make office automation decisions.

### Experience

Canadian companies which have participated in the Office Communications Systems Program (OCS) have emerged as leaders in the field, with an array of proven integrated products and systems ready for the domestic and international markets.

Participating Canadian companies understand the value of planning, and have learned the need to understand the client's functions, procedures and ways of working before beginning system design.

### Thoroughly tested systems

Because these companies have developed and tested office automation systems under live office conditions, they have already been through the all-important learning curve, something that most other system suppliers have yet to do.

Equipment, software and systems have been refined and fine-tuned after extensive use in the field, under actual office operating

conditions, and after exhaustive studies of use, needs and preferences.

Systems developed by participating Canadian companies have been the subject of the most thorough evaluation and assessment studies ever conducted in the office automation field.

Bilingual or multi-lingual capability can be built in as a feature of most Canadian-designed office automation systems.

### Standard or specialized hardware and software

The general approach in Canada is to design systems which make use of widespread and common operating systems and hardware. This ensures a high degree of equipment compatibility and information exchange. Specialized integrated office systems, which are often required to meet particular user needs, have been ranked among the best in the world.

### A sound reputation

Canada has a general reputation for excellence in high-technology, particularly in telecommunications and software, the foundations of the integrated office.

### For more information

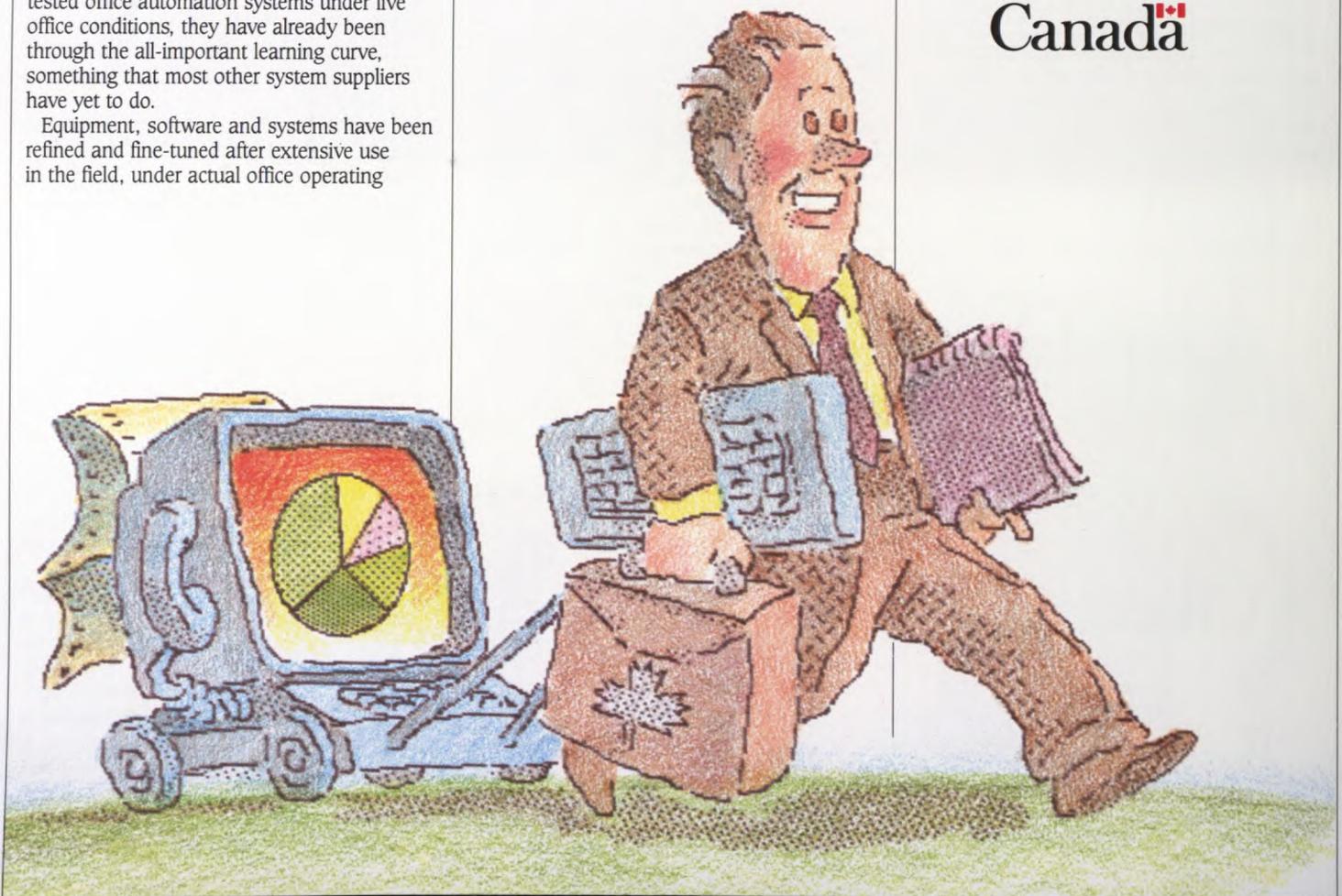
Information on Canadian office automation companies and their products and services is available by contacting the following address or telephone number. Ask for the folder: *Canadian Office Automation Technology: Company Information.*

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