Appraisal, Acquisition and Control of Personal Electronic Records: From Myth to Reality

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The Canadian Archives Division of the National Archives of Canada is faced with the dilemma created by electronic records from private sources. For over 15 years, it has been acquiring personal records in electronic form. The author provides an overview of this acquisition experience. The article analyses the types of electronic records in private archival holdings and paints a picture of the creators of these records and the evolution of their electronic environment. It identifies the main acquisition problems, suggests solutions, new strategies and new work methods that are needed to meet the challenge of this technological revolution.

Introduction

When I arrive at work at the National Archives of Canada, I turn on my computer, check my electronic mail and consult my donors directories to update my files which I have created in WordPerfect. I enter in a database the descriptions of archival fonds which will be available to the public on the Internet. I have followed the same routine every day for more than a decade.

Indeed, most of my professional life and a part of my family life is directly linked to the computer, which sits in a prominent place both at home and in

the office. The articles I write and the speeches I give are conceived, drafted, edited and stored in electronic and magnetic memories, along with my personal finances, correspondence, agenda, and a certain number of electronic games that are of greater interest to my family than to me. One thing is increasingly clear: ten years ago, such activities were quite unusual. Only a minority of people extensively used computers. Today, computers are part of everyday life of ordinary citizens and workers.

I work for the Canadian Archives Branch of the National Archives of Canada. This branch is responsible for acquiring the personal records of public figures who have contributed to the social, political, economic and cultural development of the country and of non-government organisations that impact on the national and international scene. These records include those of prime ministers, federal politicians, governors-general, judges, diplomats, senior federal officials, military officers, writers, artists, physicians, engineers, scientists, business leaders, union leaders and various companies, unions, professional associations, cultural and ethnic groups.

In 1995, the Canadian Archives Branch undertook a major study of the electronic records in its private records holdings. Since then, we have developed and approved policies, procedures and tools that make it possible to acquire and process electronic records so that archivists can work with them. This article presents a down-to-earth account of an archivist with direct practical experience with acquiring personal electronic records. I have tried to provide concrete examples, from the past six years, of the acquisition of personal records that included communications and information technologies. In order to share this experience with you, I will reconstruct the context of a time when I was faced with acquiring personal holdings that contained electronic records. In particular, I will analyse the consequences that the information technologies have had on the personal records acquisition process. To understand these consequences, I had to analyse the gradual integration of this technology into the experiences and daily lives of individuals.

Two generations of personal computer users

Shortly after my arrival at the National Archives of Canada a donor, a career diplomat, rang and wanted to meet with me to discuss the possible donation of his personal records to the National Archives of Canada. We talked mainly about his career, the types of documents he had created, the possible procedures for transfer and whether he had used a computer during his career. The last question was quite a surprise to him because he had no idea that the records he had produced using a computer could be preserved in electronic form as archival records.[1]

This donor had used the computer for over 15 years. He is not unusual. In Canada, computers are now in our homes and are part of our daily lives. We consider the benefits of using this technology boundless. Statistics Canada reports that in 1985, 13 percent of Canadian households had a personal computer in the home.[2] By 1997, this percentage had risen to 36 percent and has been increasing at the rate of 3 percent to 5 percent per year since the introduction of the Internet.[3] It is expected that the Internet will enjoy unbridled growth over the next five years. These statistics apply to the Canadian population as a whole, but when you consider that most of our record donors are professionals, businesses and non-government organisations, the numbers are even higher. It is likely that two-thirds of our donors already own a computer or a network of computers and this percentage is growing each year with the rise in the number of multimedia personal computers, the miniaturisation of computers and the fact that they are becoming easier and easier to use.

There are two generations of users among the individuals who donate electronic records. The first generation are 50 years or older who began, late in their careers, to use the first personal computers. The second generation were born in the 1960s and 1970s, and who began, earlier in their careers, using computers with the capacity and technology to allow them to create a greater volume and range of records.

The archival holdings of these two generations of users consist of records in multiple formats (electronic and other) that tell the story of their careers. The specific duties that they performed throughout their lives resulted in specific operations and actions. These actions in turn led to the production of records that had their own life cycle: active, semi-active and inactive.

As a result, the personal holdings of individuals contain several types of records: those that tell us who they are: their education; their work; their financial, family, social, cultural and recreational activities; legal and official records; personal records; various memories etc. My goal when I visit a donor at home or where the records are created is to choose as many historical records as possible to cover the diversity of the donor's activities, his social, cultural, economic roots, or his social and political thinking. General and personal correspondence produced by the individual is unquestionably one of the records of substantial archival significance to select. Records such as personal journals and correspondence provide insight into the person and his activities, and can shed light on the attitudes of a social class or segment of society to which the person belongs. During the visit to acquire an individual's records, it is important to get an idea of the nature and quantity of records relating to his professional career. Despite the use of computers by

many donors, electronic records generally make up a small percentage of their archival holdings (about 10%). This is because most records produced by the two generations of users have been destroyed as a result of the rapid obsolescence of the technology. However, in the past two years, a majority of my archival acquisitions have contained electronic records. The proportion of these records compared with paper records is growing steadily. If the archivist intervenes when records are being created, or shortly thereafter, it is possible to make donors aware of the need to preserve their records. Without our intervention, donors may destroy electronic records. Unlike the public sector, there are no regulations or general standards governing the preservation of the personal records of individuals, businesses or groups.

The two eras of the information society

When I visit my donors, I bring an external disk drive with me in order to copy electronic records of historical value so that I can take them back to the National Archives of Canada. On entering their homes, I find that, as is the case in my own home, the computer is an integral part of the rest of the furnishings. Installed in the living room or a study room, its role is to process and transmit information and to create many different kinds of records. My donors look upon the computer as a space for their work and leisure. Traditionally, a work area is designed first as a physical part of an organisation or community. It can vary in size depending on how it is to be used or its importance. It can accommodate a number of employees. However, an office can also consist of only a computer and its user. My donors use specialised software suited to their areas of activity. Word processing, management of their finances and personal assets, electronic mail and the Internet are the core elements. They produce not only textual and numerical records, but also digitised photographs, movies and sound recordings.

Compact, inexpensive, flexible, easy to use and to maintain, and with excellent options for expansion, a personal computer is a preferred tool for manipulating and transmitting all types of information. Not only does it allow us to introduce the concept of information processing into several aspects of our lives where it was virtually non-existent 20 years ago, but it has also taken over those aspects that already involved the traditional processing of information: writing, drawing, music, reading, information sharing (mail, telephones, and various transactions). Donors are business people, politicians, artists, writers, researchers in various fields, etc. They are not technicians and they have no interest in becoming computer technicians in the traditional sense. They want to get the most from their computers and the best performance possible in their area of endeavour.

The electronic environment means that I must work with two eras created by the information society: one offers me a clear and detailed map of the recent technology, and the other resembles an ancient technology, the chief manifestation of which at the time was word processing and electronic spreadsheets. It was these technologies created in the 1980s, that first made it possible for people to reorganise office work and leisure activities in the home (family and personal office automation).

Because of these two technological eras, I have had to adopt different archival approaches: one is a proactive approach for recently-created records, characterised by their diversity, by the increase in the quantity of software and electronic formats, and by the integration or interconnection of equipment. Today, this era consists of networks and multi-purpose systems. The second approach is a passive, investigative one that I use with the other era, created during the so-called 'prehistoric' era of technology, which corresponds to the first personal records of donors saved on ancient diskettes that have fallen prey to technological change. For more than 15 years, they have been identified, filed and carefully preserved in plastic boxes. The records stored on these diskettes were produced on automated office systems distinct from each other and often completely unable to communicate with each other.

Twenty years ago, word processing systems were 'stand-alones', typewriters with screens, whose only function was to produce textual documents and spreadsheets. Data retrieval systems were not considered separate entities. Today, the Internet and electronic mail are part of integrated systems that not only bring these functions together in a single machine or a network of machines but also add options for remote communication. Through satellites, fibre optics or the Internet, today's computers can provide cinema-quality audio and video transmissions anywhere in the world. It is now even possible to communicate in total security by encrypting messages.

Our so-called information society lives in the short and medium term and our strategy for the acquisition of personal archives must adapt to this technological environment. The benefits that technology offers to our donors are almost unlimited. Information technology is a constantly changing, highly diversified technology with an ever-increasing capacity for information storage. Just a few years ago, personal computers could store only a small number of records on the hard drive. From hard drives with a storage capacity of 40 megabytes in 1989, we have expanded in just a few years to a minimum storage capacity of 6.4 gigabytes and a processing speed of 700 megahertz. To save space on the hard drive and to save and exchange information between users, our donors of holdings from first generation computers collected some of their records on diskettes. That is why we find these backup diskettes when

we make acquisition visits. They are sorted according to a personal system by themes or dates, somewhat like the filing of paper documents in a filing cabinet. Today, things are different. Creators of archival holdings can store and back up a large quantity of records on a single hard drive. They can exchange information on internal networks or by using the Internet, and they can save these exchanges on the hard drive without necessarily creating backup copies on diskettes. It is therefore becoming less expensive and requiring less time to produce and preserve large quantities of electronic information both at home and at work.

The 'prehistoric' technological era

When I visit the site where records are created, I ask my donors (especially in the case of users of first-generation personal computers) to tell me about the first types of computers and software that they purchased and used, so that I will be able to convert the records stored on the old diskettes. Often they have trouble remembering this information. Fortunately, in many instances, they have saved among their paper records the invoices describing the equipment. In most cases, the computers and retailers no longer exist. When companies upgraded their equipment, they took back the old computers in order to recycle them or to sell them to schools.

These older technology computers were designed and intended specifically for word processing. Their main functions were the ability to quickly type a document and to see it displayed more or less as it would appear on the paper, text correction and editing, the merging of files, the ability to create special formats for printing, to process very simple files, to process a series of circular letters by adding a new name and address each time, and the ability to correct print columns of numbers and even do some calculations. Thus, among the 'artifacts' of donor records, we find important outgoing correspondence, personal memoirs, speeches and drafts of literary manuscripts or of various publications. Donors are disappointed when they tell me that they can no longer read these records with their present computers. Most would like to reread them to possibly rework them and publish them. When I tell them that at the National Archives of Canada we have developed an electronic record acquisition and processing system that makes it quite likely that we can convert these older records into a newer electronic format, their happiness is written all over their faces. From then on, they trust me and agree more readily to my recommendations about managing and saving the files stored on their present computers.

Technological change is part of the reason that records in electronic form still represent only a very small portion of the records in the archives' holdings.

The short life of records in electronic form, their fragility, the rapid technological change of systems and the costs of information storage space using a traditional archival acquisition method that focused on the end of the life cycle of records has lead to their disappearance. Many donors have used personal computers since the early 1980s. They produced a large quantity of automated records, but most have been lost or cannot be recovered because only a very small number have survived the technological changes. Another portion of these records, often only a small portion, were printed out. Contrary to popular belief, most records in electronic form, whether textual records, databases, tables or images, have not been transferred to paper. The computer's printer was only used by donors to meet a need for partial information, to answer a specific question or to print the raw data captured.[4] My most recent acquisitions and additions to holdings reveal that many thematic electronic directories (electronic records) are more complete than the same thematic files on paper.[5]

Today's technological era

The computers used by donors today are equipped with an impressive number of accessories, peripherals and software that enable them to carry out even more functions. They have the technology to create and store records on CD-ROMs because this medium makes it possible to store a phenomenal quantity of information at reasonable cost. Compact disk writers and readers are now sold and installed at the time of purchase. As is the case in my home, many donors also have a digitiser or scanner that enables them to digitise a large quantity of traditional records in paper, photographic or some other format. Digitising photographs has become a new pastime. They are proud to show me their virtual photo albums. They have digitised their most precious family and professional photographs and copied them onto optical disks in the form of virtual albums organised according to a thematic classification system. Some people have told me that they plan to digitise important old documents that were created on paper in order to be able to use the digital version for editing, publishing, or to free up space in their homes.

Donors are happy to show me how their computers and accessories work. They tell me that they communicate daily with friends, colleagues, former colleagues, and especially their children, and have been doing so for almost ten years. They are writing far more today with electronic mail than they ever did via traditional letters. Have they saved their electronic mail correspondence over the years? Some messages have been printed out but, unfortunately, most of the mail sent and received has been erased to avoid accumulating too much information in their computers. Electronic mail

generates a phenomenal amount of messages that can, over time, become difficult to manage. Their solution in the short term is to destroy the messages or print some of them out on paper.

Over the past ten years, electronic mail has gradually replaced their so-called traditional correspondence written on paper. That traditional correspondence represented one of the most important types of records in their archival holdings. As a result of the arrival of this electronic communications technology, we are losing a considerable amount of personal information, a step backward in terms of personal archives. This major loss also diminishes the quality and value of their records since the electronic correspondence contained information that might have shed light on their activities and the evolution of their thinking during a particular period.

Communication by electronic mail

The personal computer gives individuals remarkable access to these new so-called 'universal' media. It is hard for a society to resist for long new technologies like electronic mail that tend to enrich life and make it easier, while being less costly and more environmentally- and energy-friendly than the traditional means of doing the same thing.

During the 1980s, the technology industry developed a new workstation for individuals. It offered a new concept in human–computer relations through highly sophisticated and carefully studied programs, through the brilliant use of graphics and the positioning of elements on the screen. It forced the computer to function like a 'human' rather than the human to adapt to the peculiarities of the computer. The home and the office became multi-purpose communication centres. Communication with the machine was interactive and fast, taking on the form of a true dialogue in its many forms and manifestations. Regardless of the means used, its goal was to make communication between human and machine more perfect, faster and simpler. This marriage between information technology and communications carried with it new ideas and expressions and gave birth to a veritable culture that gradually penetrated and supplanted the culture of traditional communications. As the computer left the laboratory to take up residence in offices, schools, workshops and especially homes, it changed the lives of the people who came into contact with it. As this evolution continued, computer technology made communications between individuals a powerful tool for change. Individuals were constantly confronted with the ritual of discovery and the interactive nature of technological innovation led not only to new means of communications, but also to new behaviours. In this way, it became an active agent of social change, altering our perceptions, our behaviour and

our attitudes. It is essential that we find ways to preserve the information or personal records produced by this stunning evolution in communications.

Electronic mail, as well as the records generated by chat groups on the Internet, are important records to save for private archival holdings. Exchanges by electronic mail are a form of communication that, by its dynamism and its occurrence on a daily basis, allows for direct contact between people and leads to dynamic, spontaneous, informal and personal interaction. The historical value of this personal information can be extremely important. In some sectors of society, this form of communication acts as the medium for new ideas, new hypotheses and new research projects.[6] Compared with the traditional communications, this new system of communication is simple, fast, efficient, secure and inexpensive. Preserving this type of record would enable researchers and historians to easily access, research and manipulate the information.

Unfortunately, donors are not very receptive to the idea of retaining their electronic mail messages, mainly because of the volume of personal and sensitive information it may contain about their lives, their families and their friends. Some donors want to save their correspondence. But the simplest and fastest solution in their eyes is to make a paper copy of the most important messages. It is necessary to explain to them that a paper copy is not the solution because the messages lose their important archival value. Unique information relating to form and technique can be lost when a paper copy is made, including, among others, the information relating to the structure of the messages. Further, it can be difficult for researchers to use and manipulate the paper version. When I visit the acquisition location, I suggest to my donor that he manage his electronic mail as he does for other types of documents created using his computer. The cooperation of the donor is vital and indispensable, even if he does not have all of the knowledge needed to distinguish between documents of historical value and those that are not. When it comes to personal archives, even in the case of traditional paper records, many donors sort and choose their records themselves before depositing them in records centres. It is hard for an archivist working with private records to avoid this situation. Our role becomes one of making recommendations, suggesting certain procedures, offering solutions such as restricting access during a certain period of time, developing a retention schedule, and explaining to donors the reasons why it is necessary to save their personal records.

Electronic messages can be sorted and saved using specific criteria and procedures, adapted to their activities. Such procedures would make it possible for donors to manage their electronic mail, to save messages efficiently and

consistently, and to increase the quality and value of their archives. Electronic files can be sorted regularly (daily or monthly). However, managing electronic mail remains problematic to the extent that, when they are removed from the host software, the messages lose their evidentiary value since they can be easily altered. To sort and save messages, donors would have to create specific files in their electronic mail software and place the messages in these files to preserve their evidentiary value because only the original software has the technical structure needed to understand the context in which they were created. Since not all messages have the same archival value, choices must be made when creating files and selecting messages. Theme, addressee, sender, messages sent and received that shed light on their professional and personal activities (such as correspondence with members of their family), documents attached to messages, messages that tell us about their decision-making, positions or actions and the way in which they conduct their day-to-day activities or which reveal their daily schedule, can all be criteria for selection.[7] Messages sent to and received from their family, especially those sent to children and their work colleagues, can be of major historical value.

To preserve the quality of the contents of archival holdings produced by individuals, it is crucial that part of their electronic mail be preserved, even if selection is difficult and retention raises the problem of authentication.

Managing personal records in the computer

During my acquisition visits, I see the latest electronic environment of my donors and note the type of computer and software that they are using, how they manipulate them, organise, classify and name their directories and records. When a person uses a computer, the records created are almost always saved on the hard drive. They are reused as needed or remain there without ever being consulted again. If the person is particularly security-conscious, he will make a backup copy on diskettes or optical disks. Information on the types of computers, software, organisational structure of the files, and the protocol for naming files and records will be extremely useful to me in processing and preparing the archival description of the records. They will help me identify the context in which the records were created and to incorporate them in their archival holdings by describing the functions and activities that formed the basis for the creation and use of these records. The technical data, which consists of the organisation and electronic structure of the records, will allow me to set the standards or principles to be used in manipulating their content.

It is always impressive to see how donors file their records in their computers. Thematic arrangement is the most common, somewhat similar to the filing

of paper files. It might have been assumed that, for various reasons, individuals would store their personal records helter-skelter on the hard drive. Today's personal computers have a minimum capacity of 6.4 gigabytes. It is therefore crucial that individuals manage the various types of records they create if they are to be able to find them and reuse them. While directories and records are added to regularly over the days, the overall classification framework for records does not change very often. That framework is a personal environment unique to the individual that reflects his daily activities and functions.

At a higher level, there are four major categories of use associated with personal computers. Each requires several functions. Each function is in turn defined by the use of one or more types of software, sometimes working independently, sometimes interconnected:

- management aids (interactive processing of messages, electronic agendas, management of schedules, daily tasks and work activities, control of personal and professional expenditures and work time, electronic assistance for personal and family accounting);

- planning and decision-making aids (financial analysis, synthesis and schematic presentation of data, online access to databases, to the Internet and other information, writing of reports, minutes and other documents, etc);

- research aids (statistical analysis, Internet, indexing, etc); and

- production aids (computer-assisted designs, word processing, databases, digitisation and image, sound, multistation creations, etc).

For these activities to happen, a series of automated technical supports is needed, the key ones being local communication networks (Internet, electronic mail, fax, telephone, etc) and communication protocols. These communication functions, in turn, have given birth to a whole family of activities, including document transmission (text, graphics, sound and images), telework, computer conferencing, electronic mail, electronic bulletin boards, listservs, etc.

Each directory on the hard drive corresponds to a specific activity of the individual and the list of records on each directory provides an accurate, complete and chronological report on the actions and transactions relating to a function that that individual performed during his lifetime. Thus, the logical structure for directories on the hard drive is based on the functions, activities or names of persons with whom the donors have been or are in regular contact. If the Windows environment is used, file names can be more than eight characters long and can even be whole phrases and expressions. Donors of archival holdings spontaneously name directories and files in a

way that is unique to each of them and that allows them to later quickly access the most important records and to optimise the use of their computers.[8]

Some donors have told me that they are even able to buy and sell shares on the NASDAQ exchange using their computers and to monitor stock exchange activity. They are hesitant to show me highly personal active files, like their personal journals and finances. The computer is a personal asset that can contain our thoughts and sensitive information on our activities. This personal information is recorded and can be disseminated if the creator does not exercise some control over the records. It is now possible to use file encrypting as a very effective means of access control. However, this technique has major consequences from an archival standpoint. The recent invention of this technological function means that it is important for archivists to intervene when records are being created, or shortly thereafter, in order to be able to identify the encrypted files and, with the donor's assistance, decode them. Without this help, we will be unable to stop the loss of records. So far, encrypting is not widely used by individuals. However, it is easy to predict that this function will gradually gain in popularity. Within a few months, it will be available in the newest versions of word processing and other software because it provides security for the contents of files through the use of codes and passwords. There is no question that personal journals and memoirs are the most important records in private archival holdings. We must expect these types of records to be high on the list for encrypting by donors. In future, archivists will have to ask donors to decode their files before copying them for inclusion in a records centre.

Since most records created over the past three years are stored on the hard drives of computers (only a few backup copies have been made on diskettes and optical disks), it is necessary to explain archival standards and practices to donors in order to save and protect the authenticity of their records. In most instances, it is possible to establish a retention schedule adapted to their professions and to arrange the periodic deposit of their inactive records in the National Archives of Canada.

At the end of my acquisition visits, my donors entrust to me their 'artifacts' (diskettes) from the 'prehistoric' era and allow me to use my external hard drive (Iomega Zip) to copy most of the inactive files of historical value stored on the hard drive of their most recent computer so that I can take them back to the National Archives of Canada. These files include, among others, sent mail, agendas, speeches, memoirs or personal journals, accounts of trips, manuscripts of publications, images, databases of asset inventories or personal finances, and other records (manuscripts of various documents, etc) related to specific work activities. These records will be incorporated into their archival

holdings and preserved long term according to specific guidelines and control procedures.

Control work for private electronic records

For over four years, the National Archives of Canada has developed, experimented with and adopted new working methods and procedures to train and make archivists aware of the processing of electronic records.

Guidelines have been drafted to help archivists acquire electronic records.[9] Archivists are asked to contact the creator of an archival fonds before they cease their activities to minimise the loss of electronic records as much as possible and ensure their appropriate transfer to the National Archives. As soon as electronic records have been located in an archival fonds, archivists must call on a technician from our computer services division and the coordinator from the Division's electronic records project. With the agreement of the donor, all diskettes, magnetic tapes, CD-ROMs may be brought to the National Archives for an examination of their content. With respect to the donor's computer, an archivist may look at records in the donor's home or workplace, make a preliminary selection of directories and files, convert them to standard language or copy them in their original order or structure using an external drive (such as Iomega Zip external drive or CD-ROM external drive) that can be connected to the computer. There are various external disk or tape drives on the market. They are not expensive and are easy to use. Almost all archivists have taken a specialised course to learn how to connect this kind of external drive to a computer (Macintosh and PCs) and copy files onto zip disks in order to bring personal records back to the National Archives of Canada.

Before copying files, however, archivists and technicians are asked to evaluate the computer equipment used by the donor. During this investigation, archivists must take into account the following important elements:

•   the context in which the records were created; and

•   the physical form and intellectual content of the records.

The best strategy for copying and physically transferring records to the National Archives is determined in the light of this important information. Among the basic questions to ask the donor are:

•   the names and versions of the operating systems (eg Dos, Windows NT, Windows 95, Windows 98, Macintosh, Linux, etc);

•   the names and versions of software used to create word-processed text

records (eg WordPerfect, Word, Write, etc) and to create databases and electronic spreadsheets (eg Lotus 123, MS Excel, Access, Paradox, etc);

- the name and version of the electronic mail system;

- the name and version of the software to operate the scanner;

- characteristics of the backup system (frequency, name, software, the physical media used (diskette, tape, CD-ROMs, etc);

- a description of changes during the upgrading of electronic equipment when computers were changed or new software installed; and

- an explanation of how files were named.

For databases and electronic spreadsheets, the records must be converted to a standard format such as ASCII or DBF files. Fields should be imported into the new database software. To do this, it is absolutely necessary to note or attach the following information to the files:

- lists and definitions of fields and records for each database as well as an explanation of changes or updates over the years they have been in use;

- the number of records in each database;

- the manual(s) used to enter data;

- the definition of the codes used for data entry in each field (Code Book);

- the management system used to name database files; and

- the years that each database was created and used.

Electronic records can be transferred to the National Archives using various types of media such as zip diskettes, 3.5" diskettes, CD-ROMs (all kinds), 3480-type cartridges, 4 mm tapes, 8 mm DAT, and 9-track tapes. The National Archives can provide the donor with this material. Archivists should mention that to protect confidential information, donors should never send electronic records by online electronic mail or through the Internet because this data can be captured, copied, disseminated or modified by an outside person or by an institution other than the National Archives of Canada.

When records have been sent to the National Archives, the archivist must first process records from old diskettes or tapes as well as those from the donor's personal computer that were copied by the archivist or technician. This preliminary processing comprises putting together all the documentation related to the electronic records, numbering the material (diskettes, tapes,

CD-ROMs) and making a list of the information found on the labels. This list, often written by the donor, summarises or dates the content. The list should be preserved electronically with the electronic records.

The archivist should create an administrative file to add any further documentation or information noted during his questions to the donor and provide extra items of information related to the technical and intellectual features of the personal electronic records (code books, information on software and computers, correspondence, receipts for the purchase of computers or software, and printouts of files, etc).

All of this documentation (administrative files and electronic records) is sent to technicians who are responsible, should this be necessary, for converting files on old diskettes to standard or recent formats, if they have not been converted at the donor's home. We are able to do this because we have the programs and computers required to make the conversions. Over the past six years, the National Archives of Canada has developed a system for converting old electronic files. Thanks to this equipment, specialised personnel and the Internet, it is now possible to recover and read records created using the first personal computers sold during the 1980s. Without this equipment, it would have been impossible for us to convert these files and save them. This conversion work must be done in consultation with the archivist in order to preserve as many of the archival details of the records as possible (date and name of files, French accents or other language signs, form, and content, etc) with the resources at their disposal. Some records, for example those produced with word processing software, are preserved for now in their original formats (such as WordPerfect, Word, and WordStar). Those in database or electronic spreadsheet formats are preserved in two formats: ASCII Code for medium-term preservation and DBF format for immediate manipulation of data by archivists or researchers. A file defining the fields and records for each database should go with both these formats. A study is currently under way at the National Archives to adopt an electronic preservation format since ASCII Code is not considered to be totally satisfactory in preserving the authenticity of records.

Then, all material is returned to the archivist so that he or she may carry out archival processing (the final selection and description). Archivists use software viewers that enable them to see the content of the electronic record directories. Some can view up to 260 of the best-known electronic formats. Depending on records needs or formats, archivists can use one or other of these software programs to make a final appraisal.

Final control of personal electronic records consists in logically integrating electronic records in the arrangement plan of the archival fonds, physically

entering records on the basis of this plan into the archivist's computer and describing the records, using the archival fonds description system of the National Archives (MIKAN).

All records selected by the archivist must be logically integrated in the archival fonds arrangement plan with other types of records (when the fonds clearly contains more than one medium). We believe that electronic records should not be classified and described separately from the fonds series or sub-series to which they intellectually belong. They should be integrated with them as far as possible according to their provenance. In most cases, personal electronic records acquired by the National Archives of Canada up until now complement other types of records in a fonds. They may belong to the same series or sub-series. Nonetheless, a series or sub-series of the fonds containing only electronic records can also exist. In this case, the series or sub-series should be titled in light of its provenance, the theme (or the subject) or the nature of the records, just like any other fonds series or sub-series.

This is the decisive stage in the processing of electronic records because its purpose is to permanently incorporate records in fonds on the basis of the National Archives fonds coding system. This system applies to all fonds records carried on any medium.

Following the creation of the general description of the fonds, another description is produced by the archivist to describe in detail the content of each series and sub-series by files both for electronic records and paper records.

When the final selection and description stages are completed, a technician creates two preservation copies of the electronic records from the archivist's computer. The first copy is produced on an 8 mm exabyte magnetic tape and the second copy on Digital Linear Magnetic Tape. These are kept permanently in storage at two different locations. The content of each tape will be migrated every ten years onto new physical formats.

Researchers do not have direct online access to preservation tapes. For security reasons, the 8 mm tape may be used to copy electronic records onto diskettes in storage or onto any other medium to make the records accessible to researchers. They could obtain copies in any electronic logical or physical format required.

Redefining our acquisition method

Traditionally, records centres have tended to focus mainly on the raw material (paper documents) rather than on preserving virtual information. There is strong resistance to the changes in the archival community because it is an environment that is generally quite isolated from electronic and information

technology. Donors often know more about computer technology that the archivists themselves. It is important to understand that we are dealing with an era where information (abstract or virtual data), the digitisation of day-to-day activities and the media are now the raw materials. Records centres need to learn to manage this new raw material produced by the creators of records.

The lack of training among archivists is definitely a hindrance to the development of this sector of activity in records centres. Accepting responsibility to acquire and process records in electronic form is a major change for archivists who have little familiarity with this technology. It means not only acquiring knowledge of computer technology but also adopting new work methods and using new electronic tools to be able to acquire the records and to process them. There are three key components to understanding and adapting to the electronic environment, and to adopting and managing new common methods and work tools: they are willingness, knowledge and equipment.

People often draw a parallel between the current technological change and the industrial revolution of the nineteenth and early twentieth centuries. We are now living in the information age just as our ancestors lived in the iron age or the industrial age. We have rushed headlong into a new technological industrial age in which the knowledge and the information communicated through networks are the main driving forces. Archivists involved in acquiring private archival holdings cannot ignore this dynamic technological development. It affects all generations because everyone is intimately linked to this new industry that is changing their habits and their behaviour.

Archivists are facing a revolution that is still under way. In North America, we are currently seeing technology companies merge with key multimedia and language companies where the raw material is knowledge: languages, music, design, film, education, and telecommunications, etc. These enterprises are becoming true 'technocities'. Canadian businesses, government and non-government organisations and even individual citizens are considering what strategy to adopt to join this electronic movement, a movement in which knowledge is shared using interactive services. Internet transactions are increasing each month. The Internet allows businesses and individuals to speed up these exchanges. It is becoming an important, if not essential, complement to traditional exchanges and commerce.

We must be careful, however, not to think of this age as a golden age, a magical solution to all problems. From an archival standpoint, this age is causing us to re-examine all aspects of our traditional way of working. To do this, we will need to innovate and to acquire electronic records in order to try to understand and solve the problems that exist.

We need to find new ways to process this digital information commodity. Creators of private archival holdings are for the most part professionals, businesses and groups that use the computer as a tool for production, communication, reference and dissemination. Until now, our acquisition strategy has focused almost exclusively on the end of a record's life cycle. Most archivists will acquire holdings after the creators have completed their professional careers or have died, when companies shut down or when communities disappear. This strategy is very detrimental to developing acquisitions of electronic records in private archival holdings. There is an urgent need to re-examine this approach because, in 50 years time, or even well before then, we will be facing a significant decline in the volume of private records in records centres.

We need to begin that re-examination and we need to act quickly because the current information society poses dangers that are almost beyond the control of individuals. The electronic information produced by this society is not an ordinary commodity. Unlike material products, it can be quickly broken down, copied, multiplied, destroyed and even stolen without being altered and without its creator or owner having the simple and natural means to prevent it from happening. The only effective protection or solution for the individual is secrecy, encrypting and physical limitation of access. For the archivist, the solution may be to establish a retention schedule adapted to the activities of each individual, each profession or each type of donor.

If as archivists we do not act quickly, the technological industrial revolution will seriously impact the quantity and quality of archives produced by individuals. All that will remain as documentation will be memories like the 'artifacts' of the 'prehistoric' technology and a few printouts that will not give archivists and researchers the context for the creation of the records. The height of irony would be if information technology, created to streamline and improve work and communication, were itself to cause the disappearance of personal records. What would you think of a society where the only personal records that exist are a few computer printouts and some memories, while potential donors stockpile in their personal computers masses of historical data or information without giving any thought to saving that information?

Whatever the case, what strategy should archivists adopt to deal with this changing environment: wait patiently for everything to work itself out or gradually integrate new types of acquisition interventions? It is already too late to adopt the first approach. We need to be proactive and innovative. Archivists need to be part of this dynamic process created by the information society. Archivists responsible for private source archives need to shift from a passive approach to a more active one so that they can intervene while records

are being created or shortly thereafter. We have no choice if we are to save private historical electronic records.

The consequence of this approach would be the development of a partnership with the donor. This partnership would see the periodic transfer of electronic records, thereby avoiding the problems associated with technical conversion.[10] This intervention would initially be limited to identifying donors, providing them with advice, offering expertise and instructions on management, and saving and transferring electronic records to records centres.

Since the early 1990s, the Canadian Archives Branch of the National Archives of Canada has been using this approach in a number of sectors of Canadian society with very positive results. Donors are cooperative in most instances. There has been a steady increase in the quantity of electronic records acquired. In the future, the public and the National Archives of Canada will be the beneficiaries of this new approach to the acquisition of private archives.

In parallel to this strategy, we need the archival profession and universities to work together to influence industry in order to establish guidelines and specifications to preserve the authenticity of the records and make sure that the software they are created in enables us to acquire good archival records (eg the InterPares Project).[11] However, electronic records are created every day and we cannot wait for these solutions. We need to hire archivists and train them to deal with electronic records and we need to utilise the knowledge and expertise at hand to acquire and process electronic records.

Change will not be possible without adequate training for archivists and for young people entering this profession. While they do not need to be computer technicians or programmers, archivists will need to be familiar with and be able to manipulate the most commonly used operating systems on the market, such as Macintosh, Windows NT, Windows 95, Windows 98, Linux, and others, along with the software used by donors, so that they can understand their usefulness and the context in which records have been created, they can select records on-site, and then ensure the technical preservation of those records. This is achievable given that software is becoming increasingly user-friendly. It is to be hoped that, in future, systems will continue to become even more user-friendly from a technical standpoint.

Conclusion

Technical phenomena and communications are not isolated elements, unrelated to each other, or accidental and unpredictable. They are part of a global evolution toward a new type of information society, the details of which are not yet clearly defined but the overall design of which is already apparent.

The generation born in the 1990s and the year 2000 will be unable to function without computers and without the digital intervention of linked networks. For the most part, their personal records will be in electronic form. I am optimistic that future archivists will be able to deal with this new technological era. However, we need to prepare the way by obtaining for them now the initial means and tools that will enable them to meet the challenge of this electronic evolution where knowledge and information will, for the most part, be produced and shared using interactive services.

Researchers will appreciate using records in electronic form. Paper printouts of records can lead to the loss of the ability to sort and organise information in order to respond to a researcher's request. Electronic records have many benefits: they do not take up much space, they facilitate research and they can be disseminated over the Internet. But to take advantage of these benefits, including the small space and large quantity of information useable by the public, we need to demystify these records, to understand how they operate, to understand their historical and technological evolution, and most of all to ensure that the best archival records documenting the work of our donors are preserved.

Endnotes

1 Théodore Jean Arcand was born in 1934. He worked for the Department of External Affairs from 1958 to 1993 as a diplomat in Western Europe, Eastern Europe, Africa, the Middle East and at the Vatican.

2 André H Caron, Luc Giroux, and Sylvie Douzou, *L'appropriation du 'virage technologique': le micro-ordinateur domestique*, Cahier de recherche en communication, University of Montreal, 1987, p. 112.

3 Statistics Canada, *Catalogue 64-202-XPB, Text Table I. Percentage Distribution of Households by Dwelling Characteristics, and Household Facilities and Equipment for Selected Years*, 1992–97, p. 17.

4 Yves Marcoux, 'Les formats de documents électroniques en archivistique: la solution au problème des archives électroniques passe-t-elle obligatoirement par les formats normalisés de documents structurés?', *Archives*, vol. 26, nos. 1 & 2, pp. 85–100.

5 This includes the acquisition of the holdings of Justice Peter Cory and additions to the holdings of Chief Justice Antonio Lamer and Justice Claire L'Heureux-Dubé of the Supreme Court of Canada, among others.

6 Susan S Lukesh, 'E-mail and Potential Loss to Future Archives and Scholarship or The Dog that Didn't Bark', *First Monday* (peer-reviewed journal), at *firstmonday.org/issues/issue4_9/lukesh/index.html.*

7 Nicole Périat, 'Politique de gestion du courrier électronique: des mesures à prendre', *Archives*, vol. 29, no. 1, pp. 3–56.

8 National Archives of Canada, 'Management of Electronic Records in an Electronic Work Environment' and 'Retaining Records in an Electronic Work Environment', Information

Management Standards and Practices Division, Ottawa, 1996, and International Council on Archives (ICA), 'Guide for Managing Electronic Records from an Archival Perspective', Committee on Electronic Records, Paris, 1997.

9 This document entitled, 'Directives and procedures for the integration of records in electronic form within the archival function', November 1998, is available to the archival community by writing to: lpaquet@archives.ca.

10 Adrian Cunningham, 'The Archival Management of Personal Records in Electronic Form: Some Suggestions', *Archives and Manuscripts*, vol. 22, no. 1, pp. 94–105.

11 The InterPares Project is a major international research initiative in which archival and computer engineering scholars, national archival institutions and private industry representatives are collaborating to develop the theoretical and methodological knowledge required for the permanent preservation of authentic records created in electronic systems. You can find more information at: *www.interpares.org*.