

**Maintaining Our Documentary Heritage: The Challenge of Electronic  
Records Archives at the University of Manitoba**

By

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**MAINTAINING OUR DOCUMENTARY HERITAGE:  
THE CHALLENGE OF ELECTRONIC RECORDS ARCHIVES AT  
THE UNIVERSITY OF MANITOBA**

**BY**

**MARK VAJCNER**

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University  
of Manitoba in partial fulfillment of the requirements of the degree**

**of**

**MASTER OF ARTS**

**Mark Vajcner**

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## Abstract

This thesis proposes to examine the challenges associated with the implementation of an electronic archiving program at a medium sized educational institution such as the University of Manitoba.

A sizable and growing body of literature related to the theoretical aspects of managing electronic records exists. Furthermore, the national archives in Canada, the United States, and Australia have been leaders in the development of strategy for large government organizations. No comprehensive study of strategy for smaller institutions has been undertaken. This thesis will fill that void and enunciate an approach of cooperation and coordination between archives, record creators, and computer professionals that is suited for the small to medium sized institution.

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## Introduction

The emergence of the computer in the second half of the twentieth century has had a profound impact on modern society. Today computers are an integral part of the administration of many organizations. From the creation of documents using word processing software, databases, and spreadsheets to the increasing use of electronic mail, more and more of the transactions of the modern organization pass at some point through an electronic form. Recent software developments focus on document management which, conceivably, will lead to many transactions existing entirely in electronic form with no paper, or hard copy, record ever being created. In certain instances this is already the case and the accelerating use of such information technology raises profoundly important questions of how best to manage and preserve the electronic document to maintain accountability and to protect the historical record.

The development of archival theory in the past two hundred years has focused on the record and its ability to serve as accurate evidence of past actions. Knowledge of the creator and the context of creation are as important as the information conveyed in any document. Only in this way does the record allow us to answer who did or knew what, when, where, and why in carrying out a specific program or function. Electronic recording media pose specific challenges to archival theory that past technologies did not raise. The ease with which information can be deleted or altered and the separation of contextual

from informational data are issues that threaten the status of the records as evidence. Protection of records for evidential purposes is the primary aim of record keeping.

In addition to the issue of recordness, two other important problems are the physical fragility of computerized recording media and the quick obsolescence of the technology necessary to retrieve and view the record. These two problems will be a continual concern for archivists. Physical fragility has never been as significant an issue with paper documents as it is with electronic documents. Paper is a relatively stable medium which can be stored under almost any circumstance for long periods of time. This, however, is not true of electronic information. Magnetic and other computerized recording media are far more volatile than paper. They need to be kept in controlled circumstances to protect against excessive heat, cold, dust, and magnetic fields.

The dependence on computer hardware and software to view electronic information creates a further problem in the maintenance and use of electronic records. New computer systems, storage formats, and software programs appear and disappear with astonishing rapidity. For example, while optical disks may last for 25 to 30 years, the hardware and software needed to access the information may be outdated in as little as 10 years.<sup>1</sup> The obvious example is the 5 1/4 inch computer diskette. Information stored in this format is still readily readable but it is getting harder and harder to find a compatible disk drive to do so. In addition, not all current systems are compatible. Computer hardware and software marketed by different vendors may be incompatible without undertaking conversion procedures in which information may be corrupted or lost.



Every few years archivists will be required to copy computerized information from old storage media to new media. They will need to update software and hardware continually to guarantee access to the information. This transfer of records from one generation to another, ideally, needs to be done in such a way that it provides the same view of the record to users as the original version did. Questions about authenticity and ensuring that no part of the record is lost during this transfer process need to be addressed. The cost of both equipment and time to do so is substantial and has led a number of archival theorists to question some of the basic principles and functions underlying archives.

Thus there exists the very real possibility that modern electronic records will be lost, causing the loss of a whole segment of history. In addition to this social issue -- the importance of knowledge of the past -- there are also legal and administrative issues that must be considered. For instance, how can an institution be held accountable for its actions or defend itself against unjust attack when records are missing or do not contain the characteristics necessary to serve as proper evidence of past actions? Since so much of modern society is, whether we realize it or not, dependent on proper contemporary and historical records, the loss of this information could have a profound impact on the way institutions function.

The gravity of the loss of computerized information is understood when one realizes that archiving, or the keeping of the ideas and thoughts of past generations, is one of the four fundamental components of recorded human communication. The first, or most basic component, is the idea or message to be communicated and its expression in symbols. The idea must be present before

any of the other components can be utilized. The information or knowledge is expressed in the signs and symbols of language, or any of the other codes that are used to communicate. When it is recorded on a medium it takes on a physical form and an existence of its own. This is a second component. Whether this medium is a clay tablet, parchment, paper, or a computer disk is immaterial, the idea now constitutes a basic and simple record which needs to be managed in connection with other records so that information may be retrieved and used when it is needed. This management process is the third component of recorded communication because the way record keeping systems are structured (whether they are hierarchical, decentralized, etc.) tells us as much about an institution's organization and world view as do the records themselves. The final, and maybe most complex, component of recorded communication is to communicate all of the above across time. This is the role of archives and preservation of this laudable role should be the central concern of archival theorists and archivists engaged in the management of electronic records.<sup>2</sup>

There is a sizable and growing body of literature related to the theoretical aspects of managing electronic records. Also, various archives have developed strategies for dealing with the challenges of electronic records. The intent of this thesis is to contribute to this growing body of knowledge by discussing electronic record archiving with a particular setting – that of the University of Manitoba.

The University of Manitoba is one of Canada's major teaching and research institutions. Located in the city of Winnipeg in the province of Manitoba, this university has about 25,000 students and 3,300 faculty members. Established in 1877 to confer degrees on students graduating from the three denominational colleges then in existence in Manitoba, the university began to

teach in its own right in 1904 with instruction in the natural and physical sciences. Over the next 25 years the central faculties of Agriculture, Arts and Science, Medicine, and Law were added. Beginning in the 1950s the University library began to collect the manuscripts of several notable western Canadians, but it was not until 1978 that a formal archival program was established and a University Archivist appointed. In addition to the manuscript collections, the University Archives houses records relating to the governance and administration of the University. Records from the Office of the President, Senate, Board of Governors, General Faculty Council, the University Council, and from other administrative and support services along with those of numerous faculties and schools make up the bulk of the archives collection.<sup>3</sup>

These offices are beginning to generate and maintain more and more of their vital documents in electronic form. The archives, in order to continue to meet its mandate, needs to develop strategies and procedures to ensure that records existing in electronic form remain accessible over the long term. This thesis enunciates an approach for the long-term management of electronic records which is neither entirely custodial nor entirely decentralized.

The University Archives, acting alone, does not have the technical nor the financial resources to undertake the complex issues of acquiring, migrating, and preserving electronic records. However, other service units on campus perform many of the technical tasks that will be needed in the long-term preservation of electronic records. Partnerships with these service units is the approach which is recommended. The key to success is coordination and cooperation between the Archives, records creators, and the Information Services and Technology unit

which plays a central and vital role in the manner in which most university record creators manage their current electronic records.

## Endnotes

1 Jeff Rothenberg, "Ensuring the Longevity of Digital Documents" in *Scientific American* (January 1995), p. 44.

2 This model of the components of communication was developed and described in Tom Nesmith, "Rethinking the Archival Document: The Next Frontier in Computing?", (Unpublished Paper, 1996), pp. 2-3.

3 Richard E. Bennett (ed), *A Guide to the Major Holdings of the Department of Archives and Special Collections* (Winnipeg: University of Manitoba, 1993), pp. iii-iv.

## Chapter I

### Archival Theory and the Archival Response to Electronic Records

During the last two decades archivists worldwide have begun to struggle with the question of how to manage and preserve electronic records. Some theorists view the challenges raised by electronic records as an opportunity to redefine the role of archives and the archivist, others have every confidence in finding the solution by the diligent application of traditional archival theory. In many respects, the archival management of electronic records is subject to the same concerns as the archival management of traditional records. Electronic records need to be appraised, arranged and described just as traditional records have been managed. Issues of media degradation and technology have also confronted archivists in the past. The preservation of sound recordings, film, and photographs are the most obvious examples. In all past circumstances, the basic principles that are the foundation of modern archival theory -- provenance (the origin of the records) and contextualism (the context of their creation) -- have been explicitly accepted. This has not always been the case with electronic records. When the first efforts were made to archive electronic records in the late 1960s and early 1970s, the concern was to acquire records and migrate them in such ways that future generations would have access to the information they contained. As Lionel Bell, of the British Library, and formerly of the Public Records Office, declared in a paper read to the International Congress on Archives in 1976,

with computer files archivists are for the first time dealing on a large scale with information as such rather than as the byproduct of individual administrative actions.... What we are asking here is whether the file – without regard for its origins or current use – contains information which future users are likely to wish to exploit.<sup>1</sup>

This criticism of the importance of traditional principles was reinforced in 1981 when Frank Burke, of the United States National Archives and Records Service, extended the questioning of provenance beyond the confines of electronic records to all types of documentation by declaring that such principles as provenance “are not immutable, but being compiled from empirical studies, are limited in their applications to certain types of records in certain types of institutions”.<sup>2</sup>

Since the mid 1980s, however, there has been a renewed appreciation among archivists of basic archival principles, such as that of provenance and contextualism. Ironically, the computer, which triggered the questioning of provenance, has played a key role in the rediscovery of traditional archival principles. More than a decade of experience with electronic records revealed the importance of knowing the origin of records (provenance) and the context of creation (contextualism). Evidence of actions – not just simple information – is demanded of electronic records just as it is of more traditional forms of record keeping.

### **The Development of Modern Archival Theory**

But what exactly are these principles, why are they important, and how did they develop? The institutions that we today consider to be archives had

their beginnings in the eighteenth and nineteenth centuries. During this period archives acquired many of the characteristics that we associate with them today. Prior to the French Revolution archives consisted of narrow bodies of records which were considered to be the private property of their sponsor. Documents which were considered to have financial, legal, or diplomatic importance were kept chiefly to prove or guarantee the rights and privileges of their owners.<sup>3</sup> This mandate changed dramatically during the French Revolution. The overthrow of the French monarchy in 1789 suddenly altered the status of most archival materials in France. Current records became historical documents almost overnight. During the early days of the revolution great quantities of these documents were destroyed because of their connection to the old regime. Gradually a more rational view began to develop as the state began to acknowledge its responsibility for the preservation and care of the documentary heritage of the past.<sup>4</sup>

In order to meet this new responsibility the *Archives nationales*, which was established to serve as a parliamentary archives in 1789, evolved into a central archives for the entire state to which the provincial, or departmental, archives were subordinated in 1796.<sup>5</sup> Thus, for the first time in history a truly centralized national archival system with responsibility for historical documents was created. Current records were maintained in government offices and still kept secret, but access to the historical documents was provided by law.<sup>6</sup> These three principles established by the French, namely, the importance of historical documents, the centralization of archives, and the accessibility of documents, form the basis of modern archival practice.



The "scientific" development of historical studies in the early nineteenth century did much to advance the idea of archives as repositories of historical documents. In a letter written to his brother in 1831, Leopold von Ranke, a pioneer of modern historical methodology, outlined his view of history. "My basic thought", Ranke wrote, "is not to accept one theory of history or another... but to recognize the facts, to master them and display them".<sup>7</sup> These facts were to be found in the documents and the consequence of Ranke's doctrine was that if the archives were exhaustively utilized, history, as it actually was, or to use the famous German phrase, "wie es eigentlich gewesen" would be revealed.<sup>8</sup> Ranke, time and time again, scoured the archives looking for that one document that contained the facts that would allow everything to fall into place and history to be revealed. Following Ranke's example, scholars slowly began to enter the archives first as researchers but soon as custodians as well.

The needs of scholarship seemed so important and so obvious that entirely artificial systematic arrangement schemes were introduced to facilitate scholarly use. In time, however, such artificial classification systems began to break down. The original order of the documents was obscured when classified by subject and at times it was difficult to determine the proper subject heading of material. Such problems, along with an ever increasing amount of material which needed to be classified, clearly indicated that a simpler and cleaner method of organization was needed.

This method was arrangement according to provenance and the first steps toward it were again taken in France. In 1841 the French Ministry of the Interior issued a circular mandating the organization of departmental and communal archives according to their originating office. Henceforth all of the

records of a given origin were to remain a distinct entity classified under the name of their creator. To do otherwise would obscure the origin of the material and thus compromise the integrity of the records as evidence. Although the French were willing to maintain all the records of a given creator, or its fonds, according to creator (this is known as *respect des fonds* and is the first of the two components that constitute provenance), they did not hesitate to tamper with the order of individual documents within the fonds. This second component of provenance, maintenance of the original order of the records within a fonds, was prescribed in 1881 when the Prussian government issued its regulations on the organization of state archives. Drafted by Max Lehmann, who fought bitterly for the recognition of provenance,<sup>9</sup> the regulations accepted the French theory of *respect des fonds* and strengthened it in two significant ways. First, each single fonds was to represent the work of a single creator, and second, the records within the fonds were to be maintained in the order in which they were created.<sup>10</sup> These two ideas, a legacy of the scientific history of Ranke, dramatically strengthened the concept of provenance because, in order to reconstruct the past as "it actually was", it was imperative that the documents be maintained in the exact order of their creation.

The nineteenth century European development of the contextual approach to archival organization is one of the most important intellectual developments in the history of the archival profession. European theorists, like Max Lehmann, formulated the idea that archival documents could only be completely understood in context, or in relation to their origins and to other documents, not as self-contained, independent items.<sup>11</sup> Although arrangement by provenance quickly took precedence over subject schemes in Europe, in North America there was only a gradual and slow acceptance of the concept.<sup>12</sup>

The development of archival repositories in the United States was fostered not by the state, but by private historical associations and libraries.<sup>13</sup> The collections maintained by these institutions were usually very eclectic and artificial, focusing on the importance and quality of the single document and the information it conveyed rather than on its origins and context. Collections were handled like library material with the focus placed on content and arrangement according to subject. While the strengths of the European model were recognized in the 1930s and 1940s, the tie to librarianship continued, making the questioning of provenance possible.

But the limits of the information retrieval agenda of Bell, Burke, and others, were quickly realized and the place of provenance reinforced.<sup>14</sup> This insight was developed in the works of contemporary archival theorists such as Richard Berner, Richard Lytle, and David Bearman. In their seminal 1985 article, entitled "The Power of the Principle of Provenance", Bearman and Lytle proposed extensive use of provenance information as a means to provide "retrieval access points" to records. "To retrieve anything," they argue

a handle is required. The handle, or access point, is a characteristic which can be used in conjunction with other characteristics to identify a set of objects for examination. This applies equally whether the objects of retrieval are items in a grocery store, books in a library, or records in an archives. What differs is the appropriate characteristics – or, more precisely, which characteristics will prove most discriminating and most useful to searchers.<sup>15</sup>

The access points that Bearman and Lytle suggest as most useful for retrieval are the functions performed by the record creators and the forms of the records that they create.<sup>16</sup> Knowledge of function and form permits archivists to

infer much about the nature of the information content of records and "would obviate much of the need for subject indexing of them".<sup>17</sup> For example, the functions performed by the Department of Indian Affairs and Northern Development are quite different and distinct from those performed by the Department of Foreign Affairs. Obviously one would not search the archival records of Foreign Affairs to find information on the procurement of farming implements for Indian reserves, nor would one consult the records of Indian Affairs and Northern Development to learn of Canada's relations with the United States. The distinction between different types of documents, or forms, is also important for using provenance as a retrieval tool. For example,

the distinction between a diary, a journal, and a day book in the nineteenth century represents a distinction between the categories of information each will contain and the perspective represented by their creator. Archivists know the differences between these "forms" and what information each contains without having to read each example; again archivists can thus know from provenance rather than from subject indexing certain elements of the intellectual contents of records.<sup>18</sup>

In addition to addressing the limited role that provenance has played in traditional information retrieval, Bearman and Lytle argued that their conception of the role of provenance would also address a limitation in the conventional application of the principle to arrangement and description techniques. Traditionally, the implementation of provenance in arrangement and description has been to associate the archival records with one record creator. This practice was brought into question in the mid 1960s by such theorists as Peter Scott of the Australian Archives. Modern institutions change structures and functions so rapidly that the records in a particular record keeping system are often created

by more than one institution as responsibility for the system is moved from one institution to another in the course of administrative change.<sup>19</sup>

### **David Bearman: Reinventing Archives for Electronic Records**

Historically, bureaucracies were relatively stable entities that functioned in a hierarchical manner according to well-defined policies and procedures. As Bearman wrote in 1992

Bureaucratic organizations evolved to assert their authority across what were then vast distances in space and time. Through them, Chinese, and later European, governments could control remote districts and even colonies through written procedures uniformly applied. Bureaucrats were trained to follow procedures, to document their transactions... and to submit reports to a central office for unified bookkeeping.<sup>20</sup>

Bureaucracies were designed as "strategies for organizational management of far-flung enterprises" and their record keeping systems were "developed to support standardized action, coordinated and consistent control across the distance of time and space".<sup>21</sup> The use of provenance has reflected this hierarchical nature of record keeping. The classic example is the record group system of classification in use by the national archives of both Canada and the United States. Archival documentation is organized by government department with the implicit understanding that any record keeping system can only originate under one authority and thus belong to one record group.

The electronic information revolution has, however, vastly reduced the distances of time and space in which bureaucracies operate. This has, to a great

extent, undermined the structure of these traditional bureaucratic institutions.<sup>22</sup> Today modern database and electronic information retrieval systems provide managers with information that previously was summarized for them by subordinates. At the same time the technology provides workers throughout an organization with access to information as well. The effect is a flattening out of organizations in which the control of the central authority over transactions and record keeping is reduced.<sup>23</sup> The structural relationship within modern organizations is thus immensely more complex and fluid than that portrayed in the classical model.

In the modern world of task forces and committees, staff roles and sub-contracting, this seemingly simple structural relationship is in reality immensely complex. On organization charts this complexity is indicated by dotted lines, influence arrows and circles, two-way authority links, and other shorthands which represent a host of non-hierarchical relationships.<sup>24</sup>

The European response to the impact of technology on organizations and the record keeping systems that organizations produce, Bearman argues, differs significantly from the response developed in the United States. The emphasis in Europe is placed on the bureaucratic system to provide the functional provenance for electronic records while in America the response has been to develop technological solutions that "seek to capture certain forms of documents... automatically".<sup>25</sup> This difference in emphasis is a result of the traditional view of bureaucracies on the two continents. In the United States large bureaucracies have traditionally been viewed with far greater suspicion than in Europe. The emphasis has been placed on the free market and on fluid structures that are able to adapt quickly to changing conditions dictated by technological or economic circumstances. Such a theoretical outlook has also

had an impact in the archival field. In the United States most archivists assume that the latest technical innovations will be implemented because they result in higher production and greater efficiency. Therefore, their uses cannot be restricted or predicted.<sup>26</sup> The most effective means to control archival documentation is thus to make control an implicit part of the technology.

European archivists, however, have a different approach to the problem. The European tradition displays greater confidence in organizational policies and procedures and a belief that these can control the implementation of electronic systems.<sup>27</sup> Unlike in the United States, European organizations have been much more hesitant to introduce new technologies and when they do, they usually develop substantial administrative controls that govern their use. At a recent meeting in Marburg for example, German archivists were unanimous in their belief that traditional classification methods could be applied to electronic records and that these records could be managed by traditional registry office practices.<sup>28</sup>

David Bearman and Margaret Hedstrom believe that to respond adequately to the challenge of electronic records a fundamental rethinking of many aspects of archival work is necessary. They paint a portrait of archives that are unable to cope with the massive volume of records for which they are responsible. Added to this are the dramatic changes in electronic communications and data processing that are transforming the very activities that archivists are documenting. These challenges are overwhelming archives with new and complex demands and problems.<sup>29</sup> Bearman and Hedstrom call for a radical reorganization of archival practice and theory. They write:

...it is time that archivists re-examined the program structures and methodologies.... archivists would be well served by thinking through alternatives to their current methods... they must demonstrate that they are achieving the ends for which archives are established – preserving access to records of continuing value.<sup>30</sup>

This is a call for fundamental change, a radical realignment rather than a natural progression and owes much to contemporary trends of "re-invention" in the public and private sector. Bearman and Hedstrom use all the so-called buzzwords of this genre of writing: "more effective", "efficiency", and "responsiveness" are terms sprinkled throughout their writing. True to this style of thought the re-invented archives, like the re-invented government championed by some in the United States, is smaller, would provide fewer services, and would leave key components of its present function to the private sector. This agenda is a political agenda and the archivist should be aware of its implications.

Bearman and Hedstrom make several important observations about the nature of electronic records and the challenges that archivists face. Because the medium on which electronic information is recorded (magnetic tapes and diskettes, CD-ROMs, etc.) is so fragile, there is no way to keep and preserve the original artifact as with paper records.<sup>31</sup> The expected lifetimes of common digital storage media range from as little as a year for magnetic tape to 30 years for optical disks<sup>32</sup> and these estimates depend on optimal storage conditions in which temperature, humidity, and dust are controlled and kept at a constant rate. Maintaining optimal storage conditions tends to be a complex and expensive conservation problem. Therefore physical preservation, in the case of electronic records, is a non-issue. "All records", Bearman and Hedstrom conclude,



must be copied over time and retained in software independent formats or with appropriate software to read them. All copies have the same evidential value and there is no limit on the number of copies that can be made without degradation.<sup>33</sup>

In the electronic age, Bearman and Hedstrom continue, the custody of archives "may require the on-going maintenance of a range of hardware and software and continuing migration of both data and applications".<sup>34</sup> These processes "would be very expensive and never ending".<sup>35</sup> In response Bearman and Hedstrom propose the concept of decentralized archives, or post-custodial archives:

Such concepts as economies of scale, the convenience of a central repository, and the need to consolidate resources and expertise are challenged in the electronic era when distributed processing and networking eliminate the need to consolidate holdings in a central location... to gain access.<sup>36</sup>

The idea of decentralizing archives did not originate with the "re-invention" agenda of recent years. No doubt this agenda played a role in its development into the concept presented by Bearman and Hedstrom in 1993. The idea of decentralization, however, dates back to the mid 1980s. Bearman first proposed the idea to the American National Archives in 1984.<sup>37</sup> He suggested that the National Archives take advantage of federal agencies with adequate funding and allow them to "assume responsibility for custody of archives under strict regulatory control".<sup>38</sup> If properly implemented, an increasing portion of the cost of maintaining the National Archives could be assumed by the agencies and the National Archives could focus its attention on "defining criteria" and "auditing practices".<sup>39</sup>

Again in 1989, in a study conducted for the United Nations Advisory Committee for Coordination of Information Systems, Bearman concluded that there were "few imaginable advantages and considerable disadvantages to the archival custody of electronic records". Based on cost alone, he added, the "concept of transferring custody for archival electronic records to an entity other than that which created it was inconceivable".<sup>40</sup>

Bearman outlines four forces that weigh against the continued existence of custodial archives. These four forces are organizational, professional, economic, and societal pressures.

The fact that most archivists only begin to concern themselves with the record at the end of its life cycle, has placed archives in nearly every organization near the bottom of the organizational hierarchy. Typically archives and records management are separate functions reporting through different chains of command. In order to achieve their archival objectives, Bearman writes, archivists need to "reposition themselves as policy makers and regulators" whose central purpose would be assuring that managers "demonstrate awareness of the institutional significance of information by retaining and destroying information at appropriate times and in appropriate ways".<sup>41</sup> Archivists and records managers, Bearman believes, cannot succeed in this goal from their current position in most organizations. They need to acquire a new and improved status as their first requirement.

Before this new position in organizational hierarchies can be attained, however, archivists must re-define their professional role. The custodial role is

no longer acceptable, Bearman believes, and the new archivist should focus energy on regulation, auditing and informing.<sup>42</sup>

The abandonment of the custodial role and the adoption of the concept of the decentralized archives will also, Bearman writes, have economic advantages. Most of the time and energy in present archives is consumed by the physical handling and storage of records. Surveying and accessioning materials, description, arrangement, and preservation leave few resources to do the professional tasks of archivists and records managers.

Not only is there inadequate funding for other activities as a result of the requirements of a custodial archives but, Bearman writes, "the costs of acquiring custody to electronic records exceeds that of paper records many times" and any savings realized through the reduction of storage space is "trivial".<sup>43</sup> The transfer of electronic records

to dedicated archival or records storage facilities not only fails to save much space, it frequently requires massive investments in hardware, software and training since there are no general interoperability standards that would enable such a transported application to run in the archives environment without special programming.<sup>44</sup>

The final force influencing change in archives, according to Bearman, is the societal force. As technology makes the physical location of information increasingly irrelevant, reference services are increasingly coming to be seen as basic rather than an extra. If archives have intellectual control over the records that are regarded as archival, it no longer matters where records or their users are located.<sup>45</sup> The proper working of the Bearman model, however, depends

entirely on the acceptance by society of responsibility for its records. Archivists need to instill an understanding in record creators that the documents they generate have not only immediate and short term value, but long term historical and administrative value as well. Bearman ends with a plea that archivists use the opportunity provided by rapidly changing information technology to instill in their clients, and in society in general, this responsibility.

### **Glenda Acland: An Australian Response to Electronic Records**

The traditional role of the archivist is primarily that of keeper responsible for preserving records for posterity. Glenda Acland in her analysis of traditional archival theory advances the view that the challenges of electronic records and computer technology can be met by the diligent application of traditional archival theory and practice. Acland correctly identifies that archivists stress the evidential rather than the informational value of records.<sup>46</sup> The "physical" and "moral" defense of records are the primary responsibility of archives.<sup>47</sup> But Acland sees the role of the archivist as far more than simply a keeper of the records. "The archivist", she writes "needs to be a proactive operator with clearly developed concepts of mission and goals within the overall corporate operation".<sup>48</sup>

Traditionally the appraisal of records for archival value has been undertaken after the records cease to have current administrative value at the end of their life-cycle. The archivist is called on, Acland states, to act as undertaker for the documents.<sup>49</sup> This is essentially a passive and accepting role and Acland, like Bearman and many others, questions the validity of this approach in the modern archival environment. In her view the role of the

archives must be redefined or the profession will lose its credibility. This redefinition, however, lies within the existing theoretical framework of archives.

Appraisal remains, as Acland states, the "essential pivot of archival activity". The present need is to apply these practices not only at the end of a record's life cycle but throughout the entire "continuum of the records of an organization".<sup>50</sup> The archivist does not become a records manager in the current sense of the word because of the archival commitment to evidential value, but involvement in ongoing records management requires certain shifts in thinking. This, Acland argues, is the challenge facing archivists today – to incorporate or adapt information management practices to traditional archival theory.<sup>51</sup>

One of the fundamental shifts in thinking that is required is the replacement of the concept of permanent value with that of continuing value.<sup>52</sup> Since the days of the French Revolution, archives have endeavored to preserve historical documents in their possession indefinitely. The volatility of data in computer record keeping systems together with the ephemeral nature of the records requires "the injection of continuing value archival appraisal methodology at an early state in the process".<sup>53</sup>

Information in current computer databases, however, is generally treated as data without any serious consideration of the evidential nature of the records. "All too often", Acland states, "information in computer systems is treated as a relatively isolated entity rather than an integrated part of the organization's total record resources".<sup>54</sup> The role of the archivist in this modern information environment is that of a "watchdog, a regulator, and an assessor of the

continuing evidence requirements of the organization".<sup>55</sup> The archivist must become what Acland views as an information auditor.

Acland believes that this is not a radical revision of traditional archival theory, as David Bearman has suggested,<sup>56</sup> but rather a pragmatic understanding of the archival mission. The active role of the archivist as one of a team of specialists responsible for designing and implementing both electronic and paper based record systems is, Acland argues, a logical progression of the views of Sir Hillary Jenkinson. All that has really changed with electronic records is a shifting of the order of the Jenkinson model to place moral defense ahead of physical defense.<sup>57</sup>

Sir Hillary Jenkinson's *Manual for Archival Administration*, written in 1922, provides an inspiring defense of archives as repositories of impartial evidence. Joining the Public Records Office in 1906, Jenkinson's familiarity with the corporate culture of the Edwardian British civil service greatly influenced his views.<sup>58</sup> To Jenkinson, records were the un-self-conscious by-products of administration and no interference with the original order was acceptable. Such interference would undermine the status of the records as impartial evidence. It followed logically that appraisal of the records by the archivist was not an appropriate activity. If archives possessed the original emanation of documents from a record creator, then "severing any records from that organic whole seemed to violate fundamental archival principle".<sup>59</sup> The exercise of personal judgment by the archivist on which records to keep and which to destroy would tarnish the impartiality of archives as evidence. The archivist's role was to keep, not to create archives.

The fragile nature of the medium dictates that the archivist cannot remain the final stop in the record keeping cycle but must be involved at the front end if he or she is to preserve the evidence of actions. The sanctity of evidence, in the Jenkinson model, and the role of the archivist in preserving that evidence, provides the moral authority to be involved at an earlier stage in the record's life cycle. If one accepts Acland's argument, a simple transition in concept would give archivists intellectual control over the "spectrum of records of a organization" in their new role as auditor of record systems for evidence.

Acland also touches on the two central archival principles of origin and original order. Again, as an Australian and a firm advocate of the series system, she has no difficulty in accepting multiple or variable provenance which may be arise when dealing with computer database systems. It is in the area of original order that electronic records become more problematic. "Electronic records", Acland writes,

have a virtual rather than a physical entity. The concept of intrinsic value is somewhat muddled. Electronic records have a function and form... that can be determined but new techniques, adapted for the particular media, must be developed to describe these features.<sup>60</sup>

### **Other Strategies**

Charles M. Dollar, originally with the University of Kentucky and now conducting research into the functional requirements of electronic records at the University of British Columbia, argues that original order, which is the basis of physical arrangement, has little consequence for either preserving the context of or retrieving information from electronic records.<sup>61</sup> Due to this lack of physical

arrangement, the other branch of arrangement -- intellectual arrangement -- becomes "absolutely essential to understanding" electronic records and "to the maintenance of their context and to their accessibility".<sup>62</sup>

The recent trend toward the development of standards for archival description in Europe and North America, Dollar argues, provides a solid foundation on which the intellectual arrangement of electronic records will develop.<sup>63</sup> Although there is still a great deal of work that must be done in developing specific and standard rules for electronic records, Dollar sees a system evolving that would "identify all of the information elements within a given body of electronic records, define their relationship to one another, explain their context of creation and use, provide audit trails of use, and specify the organizational responsibility for their maintenance".<sup>64</sup> In such a system description would occur at the time of information systems design and the information captured according to the guidelines described above would constitute a rudimentary finding aid to the records of a particular electronic record keeping system.

Many of the most influential and prolific archival theorists have advocated such an approach to the management of electronic records. The information captured about the record is known as metadata. The capture of metadata information is neither new nor complicated. As David Bearman reminds us, archival descriptive systems have always been metadata systems -- systems of information describing other information systems.<sup>65</sup>

Like Charles Dollar, Hamza Kandur recognizes that the problems posed by electronic records are related more to management than to technology and he recommends that archivists better communicate their requirements with



information technology designers.<sup>66</sup> In his doctoral thesis which builds on a model developed by the National Archives of Canada, Kandur lists the following metadata components of an ideal directory for accessioned electronic records:

1. Creator
2. Title of the file
3. Dates of creation and modification
4. Series information
5. Information on how the data was collected, the procedure of collection, and time span
6. Content summary
7. References to related records
8. Restrictions on use
9. Type and size of the file
10. Technical requirements, and
11. Retention and disposition information.<sup>67</sup>

The Information Management and Office Systems Advancement (IMOSA) Project, a joint initiative of the National Archives of Canada and the Department of Communications, has developed similar requirements for the management of electronic records.<sup>68</sup> The IMOSA Project is just one of many projects in Europe and North America which aim at enhancing the management of electronic records and networked office systems.

## **Conclusion**

The responses articulated to electronic records by David Bearman, Glenda Acland, and others exemplify the current discourse on how to manage and preserve electronic records. Modern electronic archiving theory maintains an unquestioning commitment to the twin pillars of archival theory – provenance and contextualism – and a future archives, based on the ideas of the various

theorists that this chapter has examined, would be a proactive and decentralized institution. Where possible, appraisal would be undertaken at the beginning of a record's life cycle rather than at the end. This shift is due to the fact that an electronic document, unlike its paper counterpart, is unlikely to survive if neglected. This proactive process of appraisal would, in all likelihood, focus on the record keeping system rather than the individual record. These record keeping systems would become central to the intellectual arrangement of electronic records and would be similar in importance to the series or fonds in paper based archives.

Intellectual arrangement, as Charles Dollar has argued, would be the central focus of the arrangement and description process as physical arrangement is useless for records that have little or no physical presence. Multiple provenance would become standard due to the fact that electronic documents are usually created and modified by many different individuals and institutions. The function and form of documents and the extensive use of provenance information would aid in description and retrieval of such multiple provenance records.

Context and contextual information would also be central in establishing intellectual arrangement for electronic records and record keeping systems. Given a specific body of records, the archivist would need to identify all information elements and define their relationship to one another. Information on the creators, dates of creation, modification and use would be essential as with any large body of records in a paper based archives. In addition audit trails, restrictions, information on retention periods and disposition, together with a designated responsibility for maintenance would need to be established.

Would the electronic archives be decentralized? The electronic archivist, if one accepts David Bearman's argument, is a specialist in retrieval and an expert consultant in the management of archival collections. Bearman and Hedstrom have written that electronic records provide the opportunity for archives to "move from rowing to steering, towards more enterprising and customer driven approaches of archival management".<sup>69</sup> Important questions remain. Are archivists supposed to convince creating institutions to undertake the work and expense of maintaining their own records? If creators do undertake this task, will they not want a larger role in determining what records are kept, for what reason, and for how long? The agenda and purpose of the creator may differ significantly from the agenda and purpose of the archivist. What happens when the creator, now engaged in "rowing", decides that it wants to "steer" as well? This eventuality seems to be the most disconcerting for archivists. Rather than abandon the custodial role altogether, a middle-of-the road approach may be the most feasible response. Archives would still maintain their traditional custodial role but maintain it in partnership with record creators and technology specialists.

This then is the vision, however tentative, of an electronic archives in the brave new world of changing hierarchical structures, instantaneous communication, compound documents, and hypertext. No doubt the model will change and develop with the benefit of experience but, at present, it represents a first and important step towards resolving the challenges posed by the electronic record. It is on this model that an electronic archiving strategy for the University of Manitoba will be developed here.

## Endnotes

1 Tom Nesmith, "Archival Studies in English-speaking Canada and the North American Rediscovery of Provenance" in Tom Nesmith (ed.) *Canadian Archival Studies and the Rediscovery of Provenance* (Metuchen, New Jersey: Scarecrow Press, 1993), p. 6.

2 Ibid.

3 Ernst Posner, "Some Aspects of Archival Development Since the French Revolution" in *The American Archivist* (Vol. 3, No. 3), pp. 159-60.

4 Ibid., p. 161.

5 Ibid.

6 Ibid., p. 162.

7 A.J.P. Taylor, *Europe: Grandeur and Decline* (London: Penguin Books Ltd., 1967), p. 114.

8 Ibid., p. 115.

9 See Ernst Posner, "Max Lehmann and the Genesis of the Principle of Provenance" in Ken Munden (ed.) *Archives and the Public Interest* (Washington D.C.: Public Affairs Press, 1967), pp. 36-44.

10 Ibid.

11 Nesmith, p. 2.

12 Ibid.

13 Theodore R. Schellenberg, *The Management of Archives* (New York: Columbia University Press, 1965), pp. 20-28.

14 Nesmith, p. 7.

15 David Bearman and Richard Lytle, "The Power of the Principle of Provenance" in *Archivaria* 21 (Winter 1985-86), p. 21.

16 Ibid., pp. 22-23.

17 Nesmith, p. 8.

18 Bearman and Lytle, p. 22.

19 Nesmith, p. 8.

20 David Bearman, "Diplomatics, Weberian Bureaucracy, and the Management of Electronic Records in Europe and America" in *The American Archivist* 55 (Winter 1992), p. 170.

21 Ibid., p. 169.

22 Ibid., pp. 169-70.

23 Ibid., p. 171.

24 Bearman and Lytle, p. 16.

25 Bearman, "Diplomatics, Weberian Bureaucracy, and the Management of Electronic Records in Europe and America", p. 179.

26 Ibid., p. 176.

27 Ibid., p. 175.

28 Ibid., p. 173.

29 David Bearman and Margaret Hedstrom, "Reinventing Archives for Electronic Records" in Margaret Hedstrom (ed.) *Electronic Records Management Program Strategies* (Pittsburgh: Archives & Museum Informatics, 1993), p. 82.

30 Ibid.

31 Ibid., p. 88.

32 Jeff Rothenberg, "Ensuring the Longevity of Digital Documents" in *Scientific American* (January 1995), p. 44.

33 Bearman and Hedstrom, p. 88.

34 Ibid., p. 87.

35 Ibid.

36 Ibid., p. 96.

37 David Bearman, "An Indefensible Bastion: Archives as Repositories in the Electronic Age" in David Bearman (ed.) *Archival Management of Electronic Records* (Pittsburgh: Archives and Museum Informatics, 1991), p. 15.

38 Ibid.

39 Ibid.

40 Ibid., p. 16.

41 Ibid., p. 17.

42 Ibid., pp. 17, 21-22.

43 Ibid., p. 18.

44 Ibid.

45 Ibid., p. 19.

46 Glenda Acland, "Archivist – Keeper, Undertaker, or Auditor" in *Archives and Manuscripts* 19 (May 1991), p. 10.

47 Ibid.

48 Ibid.

49 Ibid.

50 Ibid., p. 11.

51 Ibid., p. 10.

52 Ibid., p. 12.

53 Ibid.

54 Ibid.

55 Ibid., p. 13.

56 See David Bearman, *Archival Methods* (Pittsburgh: Archives and Museum Informatics, 1989).

57 Acland, p. 13.

58 Terry Cook, "Archives in the Post-Modern World: The Interaction of Archival Theory and Practice Since the Dutch Manual of 1898" in *Proceedings of the 13th International Congress of Archives* (Beijing, 1996). p. 6.

59 Ibid.

60 Acland, pp. 13-14.

61 Charles M. Dollar, *Archival Theory and Information Technologies* (Macerata, Italy: University of Macerata, 1992), p. 60.

62 Ibid.

63 Ibid., p. 77.

64 Ibid., p. 62.

65 David A. Wallace, "Metadata and the Archival Management of Electronic Records: A Review" in *Archivaria* 36 (Autumn 1993), p. 95.

66 Ibid., p. 98.

67 Ibid.

68 See *The IMOSA Project: Functional Requirements for a Corporate Information Management Application* (Ottawa: National Archives of Canada and the Department of Communications, 1992).

69 Bearman and Hedstrom, p. 98.

## Chapter II

### Electronic Records Management at the University of Manitoba

The accelerating use of information technology raises questions about how best to manage the electronic record. A recent study of the use of electronic information technology at the United Nations revealed chaos in the implementation of new technologies.<sup>1</sup> Basic management practices -- let alone archival issues -- were in such disarray that loss of access to documents was a common occurrence.<sup>2</sup> Many of the traditional aspects of records have been ignored as databases provided information without context. The recent rediscovery of the record as evidence and the growing consensus on the importance of contextual information, especially with regard to electronic information, will hopefully provide institutions with better tools to deal with the challenge posed by electronic records.

This chapter will examine the response of one such institution -- the University of Manitoba -- to this challenge. It will provide an outline of the nature of computerized documentation created at the university and of the Information Services and Technology unit, which is responsible for administering it. The chapter will examine current practices with regard to the keeping of electronic records and proposals for change. It will also attempt to determine whether basic archival concerns are being, or can be, addressed.



Information Services and Technology is a fairly large organization within the university structure. It is responsible for the management and technical maintenance of the university's computer systems. The mission of Information Services and Technology is to support the university in its "teaching, research and administrative endeavors by providing leadership and expertise in innovative information technology-based solutions".<sup>3</sup> These solutions include "computer, networking, administrative application development, and advisory services" along with the physical infrastructure necessary to make these services possible.<sup>4</sup>

To meet these goals Information Services and Technology maintains three major central computing systems. These are the mainframe computer, which operates both the MVS (academic) and IMS (administrative) systems, UNIX (which is the fastest growing service), and Library database systems such as BISON.<sup>5</sup>

In addition to these centralized systems there are also many microcomputers on campus. These are connected to form networks which are administered by a number of Local Area Network administrators.<sup>6</sup> These microcomputers along with computer terminals maintained at various public computing facilities across campus provide users with access to mainframe and local network services.

To perform its functions Information Services and Technology is divided into four divisions each responsible to the Executive Director.<sup>7</sup> These four divisions are Administrative Systems, Academic Computing and Networking, Communications Systems, and Institutional Analysis. The two units that this

thesis shall examine are Administrative Systems and Academic Computing and Networking. Administrative Systems consists of sections responsible for Data Control, Application Development, Database Support, Library Systems and the computer data of Student Affairs, Financial Records, and Employee Records.<sup>8</sup>

### **Employee Records**

The Employee Records system is a group of integrated database systems supporting all university human resources, payroll, staff benefits and pension data requirements. These include support of the administration and of all related legislation, regulations, and university contracts and policies.<sup>9</sup> The focus of this system is employee and employment related information. Its two major components are the Employee Records database and the Position Master database. The latter maintains data on job titles and responsibilities. Together these two databases contain records on over 40,000 past and present university employees.<sup>10</sup>

The Payroll database is easily the most complex system in Employee Records and consists of five subsystems responsible for functions such as payment calculations, tax deductions, the maintaining of a detailed audit trail for transactions, and the printing of cheques and other documents.<sup>11</sup> Major users of this system include the Comptroller's Office, the Employee Relations Office, and the Staff Benefits Office.

## Financial Records

The term Financial Records is used to describe a group of six inter-related financial database systems supporting various offices in the central administration. At the heart of these is the General Ledger System which performs many book-keeping tasks by serving as a transaction journal, account ledger, budget book, and commitments register.<sup>12</sup> Other systems in this group, and the offices they support, are:

### Database

Budgets  
Capital Equipment  
Accounts Receivable  
PO and AP  
Book Store

### University Office

Budgets and Grants  
Purchasing  
Accounting  
Purchasing & Accounts Payable  
Book Store

## Student Affairs

The Student Affairs systems group supports computerized functions for the offices of Student Records, Admissions, Financial Aid and Awards, General Accounting, Parking, and all the faculties and schools.<sup>13</sup>

All student records produced prior to 1965 are on paper only and they are in the custody of the Student Records Office.<sup>14</sup> Records created since 1965 are in electronic format and are maintained in two separate databases. The first database contains the complete academic records of past students while the second contains records for students who have been active within the past three years.<sup>15</sup> The system provides many automated functions, such as the evaluation of applicants for admission to certain faculties and schools, telephone

registration, automated fee assessment and refunds, and various academic evaluation functions.<sup>16</sup>

Student records are the most important long-term electronic records that Computer Services maintains. The Student Affairs systems are, therefore, the most advanced of the university databases in terms of archival maintenance. There are four methods of archiving student record information.

First, there are the historical and current databases described above. These two systems contain the academic information on all students at the University of Manitoba since 1965.

Second, transaction logs of these databases are maintained. Transaction logs are computer tapes that identify when changes were made to information on either database.<sup>17</sup> These transactions logs include who made the change, when, and what change was made. These logs include complete information on changes in the "information fields", or the types of information that are gathered and how they are stored.<sup>18</sup> For example, if a piece of information is updated for a specific student, the transaction log would record who made the change and when the change was made.

Third, Student Affairs keeps "freeze files" of the two databases. Since the content of the databases is constantly changing, as new information is added and records are changed or moved from one database to the other, freeze files are used to provide an exact record of the database at a particular point in time.<sup>19</sup> These files are copies of the entire database that are compressed, or specially encoded to take up less space on magnetic tape. Freeze files are then

placed into vaults where they are kept indefinitely. From time to time they are retrieved and used, most often by the Institutional Analysis Office.<sup>20</sup>

Finally, microfiche of financial information is made. These records are for evidential purposes and are kept 5 to 7 years. At the end of each fiscal year a computer generated record is printed out on paper. This printout is then microfilmed and the original computer record is recorded on magnetic tape. Both are kept for up to seven years and the microfiche is used to verify the contents of the electronic record.<sup>21</sup>

### **Database Support and Library Systems**

Library Systems is responsible for maintaining the computer system of the University of Manitoba Libraries. This system includes the DRA system, which is the system used for charging out library material, and the Acquisitions system. The DRA system does not produce records that are judged to be of lasting value and no archival practices are in use.<sup>22</sup> The acquisitions system is the only part of the Library database system that is temporarily archived. This system controls and maintains information on the 26,000 items that are ordered by the libraries annually. It is also used for budget forecasting and inflationary trend studies.<sup>23</sup> Legally the libraries are required to keep these financial records for 5 to 7 years. Therefore a microfilming program, similar to that of Student Affairs, exists.<sup>24</sup>

Database Support is responsible for the maintenance of all database engines on campus. The two central ones are IMS, the mainframe system on which all of the administrative databases are maintained, and Sybase.

Unlike the world of personal computers, where the technology changes rapidly, the evolution of mainframe computers is relatively slow. This is due to the complexity of the machines, and the huge cost associated with their purchase. The IMS system hardware, for example, has not changed significantly since about 1976.<sup>25</sup> Although there have been new versions of the software required to make the system function, these new versions have always been "backward compatible", or capable of understanding data generated with older versions of IMS software.<sup>26</sup>

Nevertheless difficulties do arise with older records. For example, if the current IMS software were, for the sake of argument, the eighth version, it would have no difficulty in reading and understanding records produced in the seventh, sixth or fifth versions. Attempting to read a record written in the original or second version, however, may prove impossible as the software has changed significantly enough to make the older versions unintelligible to the current program.<sup>27</sup> If older versions of the program have not been maintained, or, if the record has not been migrated to new versions of software as these new versions have been introduced, then the record may be difficult or impossible to access.

These difficulties are not as serious with the database systems that the university maintains. Because records are part of an active database, they are usually migrated with each updating of software.<sup>28</sup> The software evolution problem is far more serious in the personal computer environment where data or text files may be forgotten about on hard drives or disks. That does not mean that it does not happen in a mainframe environment as well. The early freeze files of the late 1960s, although still in the vaults, were rendered unreadable

when the university converted to the IMS system and are now probably useless.<sup>29</sup>

Because freeze files are compressed they need software to be made readable. This makes them vulnerable to software obsolescence, particularly since freeze files are exactly the type of information that is recorded on tape, placed in the vault, and then forgotten about. A simple solution to this problem may be to store a copy of the software program along with the data on the magnetic tape.<sup>30</sup>

Over time the problem of software obsolescence will become worse. Information Services and Technology is beginning to move away from the freeze file concept of archiving electronic records and considering the establishment of a "data warehouse" for the university. The problem of software obsolescence is not the reason behind this move toward the data warehouse but it is a definite benefit.

### **The Data Warehouse**

The term "data warehouse" is quickly becoming a buzzword within the computer industry. Regarded as the newest and most advanced method to store and access data, the concept behind it is relatively simple. A data warehouse is little more than an integrated database. The driving force behind the development of the data warehouse is the need to gain "informational access" rather than simply "operational access" to data.<sup>31</sup>

Operational access is access to the current state of specific data. Most databases have been designed to handle this kind of operational information. Informational access, by contrast, implies access to large volumes of data for "higher level assessment, planning and strategic decision-support activities".<sup>32</sup> Information of this kind is difficult to access because, first, the records are dispersed on many different databases which have different ways to navigate them and, second, many databases only contain current records.<sup>33</sup> Database Support is proposing to change this situation with the implementation of a data warehouse which would place the many systems that Information Services and Technology maintains on a central server.<sup>34</sup>

A graduate of the University of Manitoba who now works for the university will, at present, have records in at least three databases – Student Affairs, Employee Records, and Alumni – under the proposed system these three records would be combined into one. There will then be one record for each person so that the data, to quote Dan Hiebert, Manager of Application Development, "begins to reflect reality".<sup>35</sup> At the same time, however, Student Affairs, Employee Records, and the Alumni Association will still be responsible for entering information in the data warehouse and for setting terms of access to this information. Privacy controls would be programmed into the system to enable it to be made available to outside use.<sup>36</sup>

Because, by definition, the data warehouse is designed for "informational access" to historical information and not current records, detailed metadata, or information on the creation and amendment of the records, is kept. The result is a rudimentary archival process. "A data warehouse is a subject-oriented, integrated, time-variant, non-volatile collection of data".<sup>37</sup> "Time-variant" and



"non-volatile" are the key terms. Records can never be modified or deleted in the data warehouse. Therefore they are not "volatile". If changes need to be made to a record then the old record is "closed" and a new one is made which contains the contents of the old record plus the new information.<sup>38</sup> The date and time of the change are "stamped" on each record and this allows for a "historical view" of the database as it was at any point in the past.

If a student were to enter the university in September, for example, a record would be created by Student Affairs and placed in the data warehouse. Access to this record would be strictly controlled for security reasons. The record would contain, among other information, the courses in which the student has registered.

Student X  
Date: September  
Courses: History, Geography, Economics.

In October the student decides to drop a course (Geography). Instead of this information being added to the current record a new record is created and the old one is closed. The new record contains all the information of the old one plus the changes that have now been made. Both records are kept.

Student X  
Date: September to October  
Courses: History, Geography, Economics.

Student X  
Date: October  
Courses: History, Economics.

The same process is followed for each action in the student's academic career.<sup>39</sup>

This permits historical and trend analyses, but more important for the archivist, it maintains the integrity of the record and its status as evidence of past actions. "Recordkeeping systems", according to David Bearman

are information systems which are distinguished by the fact that the information they contain is linked to transactions which they document. Records may be consulted for documentation of those transactions or because they contain information that is useful for some completely separate purpose, but recordkeeping systems do not just contain data to be reused; they maintain evidence over time.<sup>40</sup>

The data warehouse concept meets several of the criteria that Bearman sets out as being necessary in an electronic record keeping system. It is "responsible" because it is governed by documented policies, assigned responsibilities and formal methodologies for its management. Operational transactions would increasingly be conducted through the data warehouse, thus beginning to meet Bearman's criteria on exclusive implementation of record keeping systems.<sup>41</sup> Finally the concept is "reliable" because it is shielded against loss of information from systems failure.

The records that would be created and maintained in the data warehouse also meet several of Bearman's criteria for electronic records. These criteria state that records be

- Comprehensive, or created for all transactions undertaken by the recordkeeping system. The data warehouse does this by generating a new record for each transaction undertaken.

- Identifiable. Each record must be discretely identified and separate from the next. This is accomplished in the data warehouse by the time and date "stamp" that each record receives.
- Complete and Inviolable. All records must contain the content, structure and context generated by the transaction that they document. Also no data within a record may be deleted or altered once the transaction which generated it has occurred.
- Auditable
- Accessible and redactable. It must be possible to retrieve a record of any transaction at any later date but still "mask" records when it is necessary to deliver censored copies of restricted information.<sup>42</sup>

While the data warehouse meets or exceeds the above criteria for archival records, it falls short in a number of areas. The most serious is in preservation. It immediately becomes clear that the record keeping process -- in which records are never modified but closed and succeeded by new ones which contain the contents of the old record plus the new information -- will generate a large amount of records, most of which will contain duplicate information. A single student, depending on how active his or her academic career is, will generate many individual student records rather than just one, and each of these records will contain all the information found in its predecessor. This explosion in volume is unfortunately the trade off for precise and secure records of action.

No one in Information Services and Technology, however, envisions that such records would be kept permanently.<sup>43</sup> The amount of storage space would become too great. As the concept is now taking shape the system may hold, for example, 20 records of the student's history. Then when the twentieth record is

closed and a twenty-first opened, the system would automatically delete the first record in the series, thus there would never be more than a certain number of records per each individual in the data warehouse.<sup>44</sup> A second option is to use time as the determining factor. In this scenario a certain number of years worth of data, or a set of "fixed-point" snapshots, would be kept.

Given rapid change in technology, it is possible that the hardware will become outdated before the automatic cutoff is reached. Since the records will be on the system and not stored externally, this change is a good thing.<sup>45</sup> "It keeps the records in mind", Hiebert says. They "aren't forgotten in some vault somewhere". There is less chance that the information will be lost, either by materials degradation, or more likely, by the obsolescence of format and software.<sup>46</sup> Hiebert sees the data warehouse replacing the freeze files which, as discussed earlier, could become lost because they are not being maintained (read or rewound on a regular basis) and thus deteriorating.

The concept of the data warehouse is, actually, a combination of the various record-keeping systems used in an electronic records environment. The data warehouse contains the database, transaction logs, and freeze files all combined into one. While consolidating the different parts of the record – information and context – the data warehouse still only preserves this complete record for relatively short periods of time. In all likelihood there will be records in the data warehouse that are worthy of longer retention and steps should be taken to make sure that these are not automatically deleted.

While the data warehouse will serve as the central storage for financial, statistical and operational data, little concern has been given to electronic

textual records such as electronic mail and word processing files. There is no provision for their inclusion in the data warehouse.<sup>47</sup> Since these types of documents will tend to contain evidence concerning policy and program development, their loss would be a substantial one.

### **Academic Computing and Networking**

These types of textual computerized records usually fall under the jurisdiction of Academic Computing and Networking. It is responsible for that part of Information Services and Technology's mission statement that deals with supporting the university's teaching and research functions. More specifically, Academic Computing and Networking provides

central computing and networking equipment to the entire University of Manitoba community... [it] also provides advice on using this equipment as well as support to users in the acquisition and use of distributed computing facilities.<sup>48</sup>

Academic Computing and Networking provides academic access to the mainframe through the MVS and UNIX systems. UNIX is the fastest growing system on campus. In 1993-94 alone the number of users increased by 3,015 and half of these new accounts were assigned to undergraduate students, as more and more courses are beginning to use computers.<sup>49</sup> Academic Computing and Networking is also responsible for the general administration of Local Area Networks, or LANs, at the University of Manitoba.

## **Local Area Networks: The Lay of the LAN**

In the 1960s and 1970s the university maintained only the mainframe computer system. It was used for various administrative purposes and by a small number of academics, primarily in the areas of physics, mathematics, and computer science. This situation changed dramatically with the introduction of the small and inexpensive micro or personal computer in the early 1980s. Computing and the use of computers, which had been a highly centralized operation, quickly became less so. Today most faculties, departments, offices, individual professors, and administrators have their own computer.

While centralized electronic record and database systems, the kind maintained by Administrative Systems, appear to have their records under control – through the use of freeze files, microfiche, and the developing concept of the "data warehouse" – the records kept on decentralized microcomputers are far more problematic. LANs pose problems because archiving has traditionally been a very centralized activity. The concept behind information management on a LAN is directly opposite to that of an Archives. In the LAN model, control of information is decentralized to small functional units for simplicity and efficiency. These functional units, however, still produce records that are of university-wide administrative and historical importance. Had the use of these machines remained completely decentralized and had each user continued to operate in isolation, the position of the archivist with regard to these records would have been impossible. Fortunately, however, that is not the case. Beginning in the 1980s microcomputers began to be connected to one another in networks. Maintaining these local networks for the university is an integral part of the Information Services and Technology mandate.<sup>50</sup>

The local networks may provide the entry point for archivists to electronic textual records on campus. Microcomputer users must be convinced to place relevant records on the LAN servers rather than keeping them on their hard drives. Information Services and Technology already encourages this transfer. Word Perfect, the most popular word processor on campus, is on the network.<sup>51</sup> This saves having to re-install hundreds of machines after each software upgrade. In addition Information Services and Technology encourages storage of Word Perfect text files on the servers to reduce the need for and expense of individual hard drives. Storage on the network also protects material from loss as data on the servers is copied on a daily basis and then stored, for up to three months, on magnetic tape.<sup>52</sup>

This system could be expanded into longer term storage for material that is deemed to have archival value. The same is possible for electronic mail. At present the University of Manitoba has no policy with regard to electronic mail and no attempts have been made by Information Services and Technology to keep these records. Although there would be little technical difficulty in establishing an electronic mail storage program similar to that in place for Word Perfect and other textual files,<sup>53</sup> is such a program worthwhile? Most messages are not archival. The medium is used to communicate many personal messages – such as setting lunch dates, etc. – rather than academic and administrative business.<sup>54</sup>

As the medium becomes more accepted this is bound to change. University memoranda are already beginning to circulate via electronic mail and as security and operational problems are resolved the volume will increase. Electronic mail is considered a record worth preservation by a growing number

of institutions across North America. Recently the Society of American Archivists issued a statement declaring that "electronic communications that are created, stored, or transmitted through electronic mail systems in the normal course of activities are records".<sup>55</sup> This action was precipitated by the widely publicized American lawsuit, *Armstrong v. the Executive Office of the President* which concerned deletion of the contents of the White House electronic mail system in 1989. This system contained records that had earlier revealed that Lt. Colonel Oliver North, of the National Security Council, and his superiors had engaged in the questionable sale of arms to Iran to finance anti-government forces in Nicaragua.<sup>56</sup> The suit that Scott Armstrong, Executive Director of the National Security Archive, filed claimed that the White House electronic mail system qualified as archival records and that failure to dispose of them in the proper manner would constitute negligence on the part of the Office of the President and the National Archivist.<sup>57</sup>

Several American universities and colleges have also established policies with regard to electronic communications. These include the University of Missouri which, in a draft report on electronic records management, has proposed that

University information created, retained or maintained in any digitized configuration on a mainframe, PC, hard disk, tape, cassette, floppy or any other magnetic storage format, any optical technology or any other type of electronic technology, may be an electronic record that must be retained to meet administrative, fiscal, legal and historical requirements of the University.<sup>58</sup>

The University of Florida also has adopted a detailed policy which includes guidelines on retention, accessibility, authentication and deletion.<sup>59</sup>



The University of Melbourne in Australia also has a project underway to develop an electronic records management program. The prime focus is on strategy to obtain support from administration for the development of ongoing electronic records management rather than the ad hoc and fragmented approach prevalent to date.<sup>60</sup>

In recent years the use and awareness of LANs at the University of Manitoba has dramatically increased. In the early 1990s many campus desktop computer users were not aware of networking possibilities but this has now changed.<sup>61</sup> By 1995, the installation of desktop computers was almost universal and the number of areas not connected to the university's Ethernet, the campus high speed data connection network, had been reduced to a very small number.<sup>62</sup> What remained was for each unit to complete its internal Ethernet installations and to adapt individual equipment to this connection.<sup>63</sup>

This campus network infrastructure makes possible the increasing utilization of the Internet and its burgeoning resources by staff and students with their desktop computers. The trend toward providing distributed network facilities is not unique to the University of Manitoba. Most Canadian universities are moving along this path. "Network facilities at a University", Computing and Network Services at the University of Alberta recently reported,

are a part of and must continue to be integrated with other Internet facilities, since all are part of the global network environment. In many ways, the campus and Internet facilities should be transparent to the community of students, researchers, academics, support staff and associated professionals. With new tools and facilities continuing to evolve as the user community demands better and more access it is essential that ongoing efforts are made to make all these resources more useful to non-technical people.

The overall objective is to provide the infrastructure and tools so that people can access information easily.<sup>64</sup>

Connection with the Internet is vital. This network of worldwide computing systems had its origins in the Advanced Research Projects Agency (ARPA) of the American Department of Defense. ARPA regularly funded projects in technological development for military problems, and, in the 1960s, began to support research into developing an effective process for computers to communicate with each other.<sup>65</sup> The first rudimentary network, between four American universities, was set up in September 1969 and by early 1977 over 100 systems were connected.<sup>66</sup> The development of the World Wide Web in 1989 served to dramatically popularize the Internet, which until then was primarily utilized by the academic and scientific community. Today the Internet connects millions of computers to a worldwide communications network. This network is increasingly used for research and communication and this role will without doubt continue to expand.

While decentralized computing provides greater convenience and simpler connectivity to Internet resources for the university, in archival terms it poses several problems. The first problem is one of software incompatibility. In the centralized model decisions on the purchase and replacement of hardware and software are made at the top-level of the organization. The changes made affect every unit in the organization at one time. Theoretically then, any electronic archiving program would need concern itself with a small number of hardware and software variations. In the distributed model this is not necessarily the case. LANs may be of different hardware and software and may not be compatible with

each other, causing extreme difficulties for an Archives which would wish to acquire these diverse records.

Distributed networks cause problems even before an Archives steps in to acquire records. The decentralized approach invariably means that there is a great deal of duplication between and within offices of certain sets of electronic documents. Distributed networks do not have the same full-time specialists committed to maintaining the hardware and software systems or to establishing proper procedure for the maintenance and disposal of electronic records. The preceding chapter indicates the detailed administration of databases and strict control of legacy records by Information Services and Technology. Electronic record creation and control in units, in contrast, is on a far more ad hoc basis.<sup>67</sup> Information Services and Technology provides numerous services that, if utilized in a systematic manner would greatly enhance the archival quality of LAN records. However, users still tend to view their desktop computer documents as personal rather than corporate information. For instance, shared directories are as easy to utilize on a network as personal directories, yet shared directories are not being utilized as a common filing system of electronic documents. Corporate information stored on the desktop computer is managed in a highly personal way with users naming files in an ad hoc manner that makes future retrieval difficult. The University of Manitoba study indicated that respondents had two primary concerns with regard to the use of electronic records in the Libraries Administration office. First, that the continued storage of electronic documents in personal directories produces barriers to access by other members of the staff, and second, that the lack of a standardized system for naming and filing documents may cause difficulty in the retrieval of these documents at a later date.<sup>68</sup>

The distribution of a questionnaire was also part of the study. This questionnaire solicited responses on a number of issues associated with a possible electronic filing system. The replies helped to determine the structure of the procedure that was ultimately recommended. No objection was expressed by any respondents to the placing of important electronic mail messages into a centralized filing system resident on the shared directory. Respondents also reacted favorably to the regular retention and deletion of electronic documents. Concern was expressed, however, that the rapid change of technology could complicate this process.<sup>69</sup> Finally respondents indicated that the four principal tasks that an electronic filing system should perform were:

- To provide quick and easy access to electronic records;
- To maintain security;
- To serve as evidence of actions; and
- To provide knowledge of who created the record and when.<sup>70</sup>

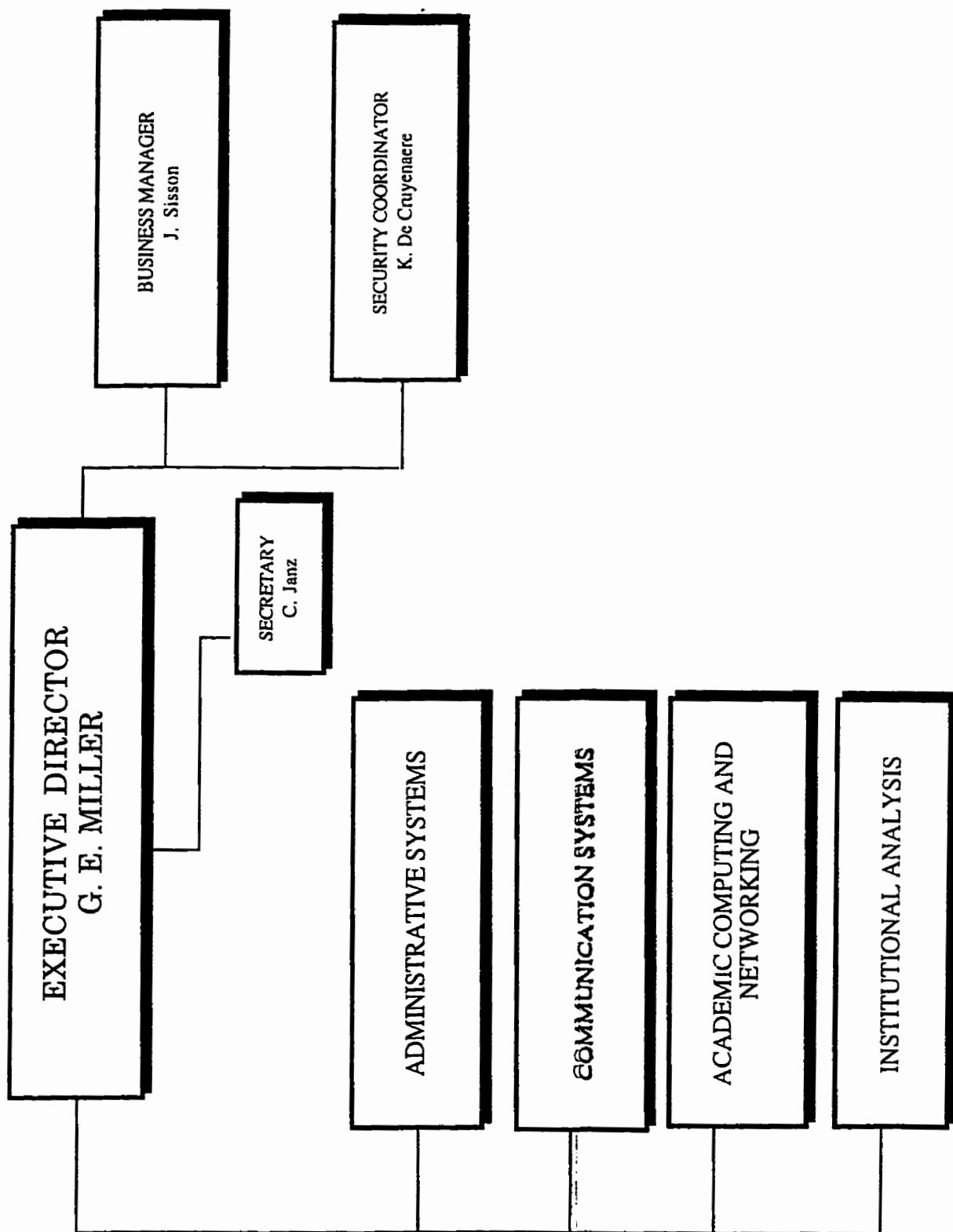
In short, the staff of the Library Administration office desires to create for electronic documents, the same kind of records management systems that most offices have for their paper files. Traditional paper-based records management is the application of systematic controls to the creation, distribution, use, retention, storage, and retrieval of documents. It creates a functional, orderly, and efficient flow of information throughout an organization. The application of these principles to electronic records represents the first step in the development of a response to the challenges posed by the electronic document at the LAN level. The trend to distributed computing within organizations will continue for the foreseeable future. The Internet itself is one vast distributed computing network, which exemplifies the superiority of this approach to computing. Since the creation and control of electronic documents is

decentralized in this approach, so too the records management efforts will be decentralized. The Archives will need to deal with not one department, as it would with the university's centralized computing systems, but with many creators of all sizes. This, however, is no different than in the traditional records management and archiving of paper records.

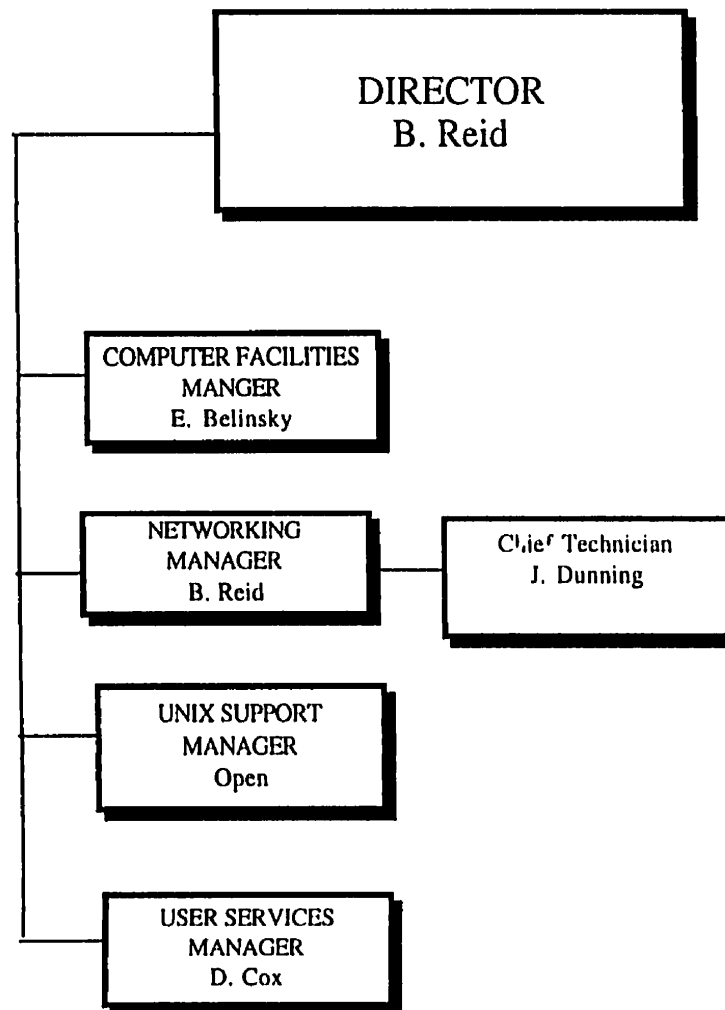
While the accelerating use of information technology has created problems that archivists and other information managers are now only beginning to come to terms with, the University of Manitoba is well positioned in the new world of the electronic record. The effective management of centralized electronic records at the University of Manitoba is well under way. Information Services and Technology maintains the hardware and the software necessary to create and utilize records. Information Services and Technology is also increasingly aware of the importance of contextual information as evidenced by the growing acceptance of the data warehousing idea. The decentralized world of LAN based computing is more problematic. The injection of archival concerns and the ability to act on those concerns is the next step.

**Information Services and Technology Organization Chart, December 1996**  
(Source: Information Services and Technology)

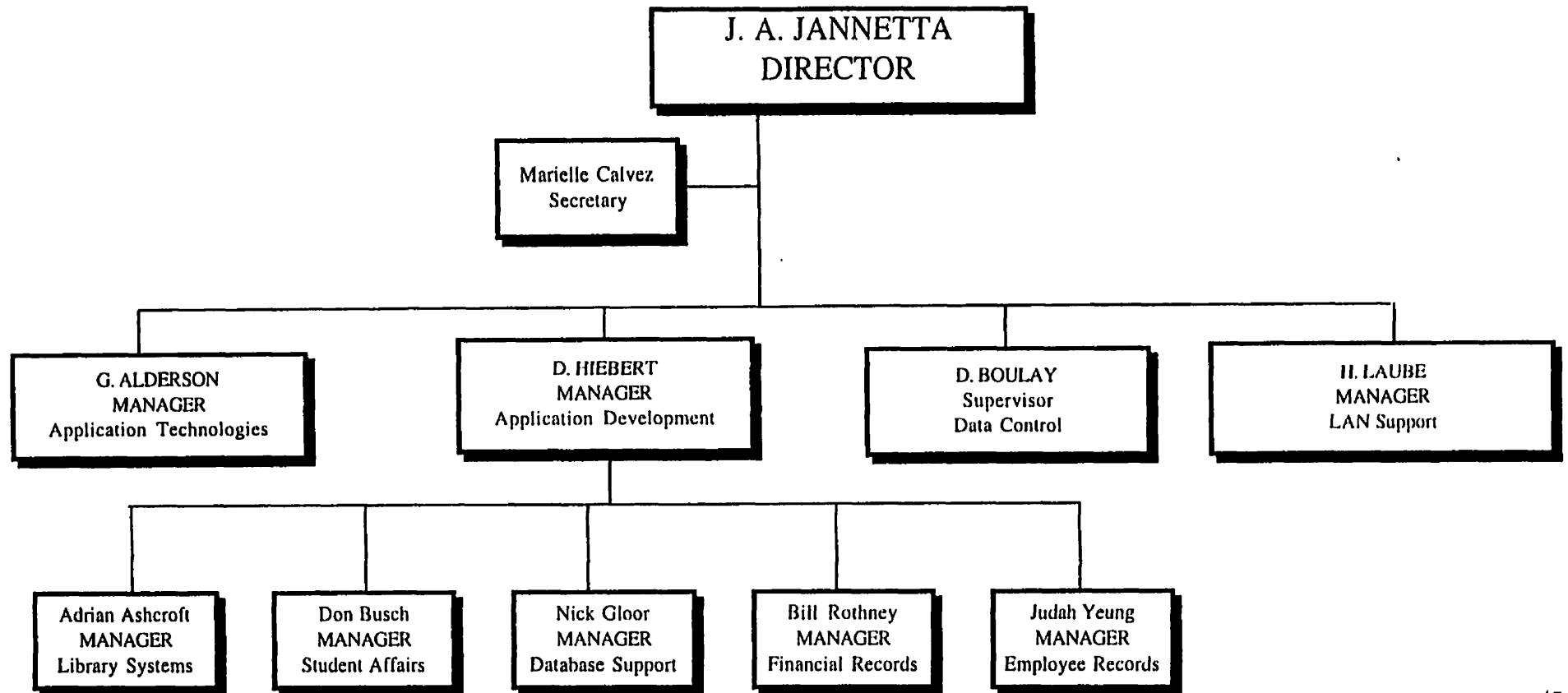
# INFORMATION SERVICES & TECHNOLOGY



# ACADEMIC COMPUTING & NETWORKING

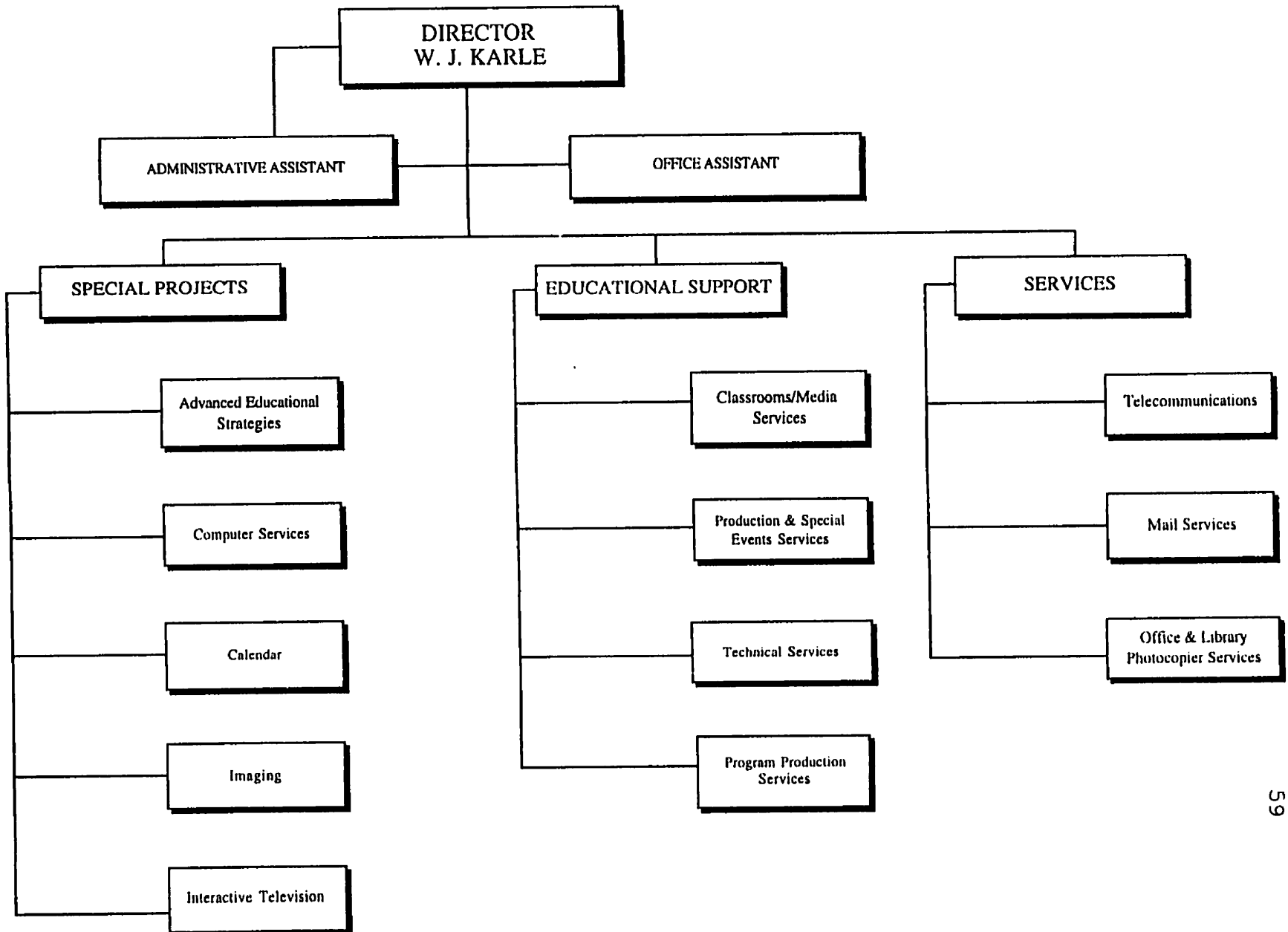


# ADMINISTRATIVE SYSTEMS

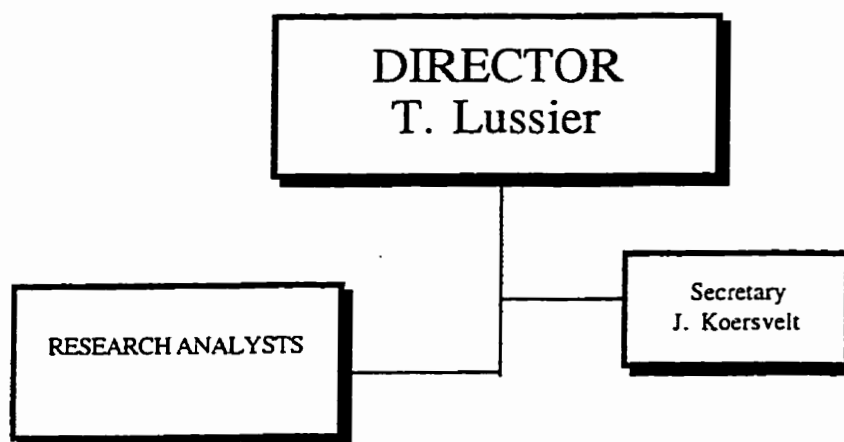




# COMMUNICATION SYSTEMS



## INSTITUTIONAL ANALYSIS



## Endnotes

1 Richard J. Cox, "The Record: Is It Evolving?" in *The Records and Retrieval Report* 10 (March 1994), p. 8.

2 Ibid.

3 University of Manitoba Computer Services, *Annual Report on Academic Computing, 1993-94*, p. 1. Since the research for this thesis was completed Computer Services has been reorganized as Information Services and Technology. The function of this new unit remains the same although the titles of its officers have changed. The text of Chapter 2 reflects these changes, the endnotes reflect the structure and titles in use at the time the research was conducted.

4 Ibid.

5 Interview with Gerry Miller, Director of Computer Services (now Executive Director of Information Services and Technology), January 9, 1995.

6 Ibid.

7 *Information Services and Technology Organization Chart*, December 1996.

8 Ibid.

9 University of Manitoba Computer Services, *Annual Report on Administrative Computing, 1993-94*, p. 3.

10 Ibid.

11 Ibid., pp. 3-4.

12 Ibid., p. 6.

13 Ibid., p. 9

14 Interview with Don Busch and Barbara Chappell, Student Affairs, March 13, 1995.

15 Ibid.

16 *Annual Report on Administrative Computing*, 1993-94, p. 9.

17 Busch and Chappell interview.

18 Ibid.

19 Ibid.

20 Interview with Dan Hiebert, Head of Database Technologies (now Manager of Application Development), March 21, 1995.

21 Busch and Chappell interview.

22 Hiebert interview.

23 *Annual Report on Administrative Computing*, 1993-94, p. 11.

24 Hiebert interview.

25 Busch and Chappell interview.

26 Ibid.

27 Hiebert interview.

28 Busch and Chappell interview.

29 Hiebert interview.

30 Interview with Jim Jannetta, Associate Head of Computer Services (now Director of Administrative Systems), February 7, 1995.

31 Ray Ferrara and Philip Naecker, "The Data Warehouse: A Giant Step Forward" in *DEC Professional* (November 1993), p. 28.

32 Ibid.

33 Hiebert interview.

34 Ibid.

35 Ibid.

36 *Annual Report on Administrative Computing, 1993-94*, p. 7.

37 Hiebert interview.

38 Ibid.

39 Ibid.

40 David Bearman, *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations* (Pittsburgh: Archives and Museum Informatics, 1994), p. 295.

41 Ibid., p. 299.

42 Ibid., pp. 300-04.

43 Busch and Chappell, Hiebert, and Jannetta interviews.

44 Hiebert interview.

45 Ibid.

46 Ibid.

47 Ibid.

48 *Annual Report on Academic Computing, 1993-94*, p. 2.

49 Ibid., p. 25.

50 Ibid., pp. 20-24.

51 Jannetta interview.

52 Ibid.

53 Busch and Chappell, Hiebert, and Jannetta interviews.

54 Jannetta interview.

55 Society of American Archivists, *Position Statement on Archival Issues Raised by Information Stored in Electronic Form*, posted on the Archives & Archivist Listserv. March 23, 1995.

56 David Bearman, "The Implications of *Armstrong v. the Executive Office of the President for the Management of Electronic Records*", in Bearman, *Electronic Evidence*, p. 119.

57 Ibid.

58 University of Missouri, *Electronic Records at the University (draft)*, October 1991.

59 University of Florida, *E-Mail @ UF: Privacy and Public Record (draft)*, 1994.

60 Jenni Davidson and Luisa Moscato, "Towards an Electronic Records Management Program: The University of Melbourne" in *Archives and Manuscripts* 22 (May 1994), p. 125.

61 *Annual Report on Academic Computing, 1993-94*. p. 26.

62 Ibid.

63 Ibid., p. 12.

64 University of Alberta Computing and Network Services. *Computing Technology Directions and Initiatives on Campus, 1993*. p. 13.

65 Scott Ruthfield, "The Internet's History and Development", *Crossroads* (September 1995). The text of this article was obtained via the Internet from <http://www.acm.org/crossroads/xrds2-1/inet-history.html>

66 Ibid.

67 See Mark Vajcner, *Proposed Electronic Records Management Procedure for the University of Manitoba Libraries*. The text of this report may be found in Appendix I.

68 Ibid.

69 Ibid.

70 Ibid.

## Chapter III

### The Shape of Things to Come?: Archives in the Age of the Computer and the Internet

Computers are sophisticated and complex machines whose use presents a number of significant archival challenges. Some of these challenges are not unlike those encountered in non-computerized record keeping systems. Computer "files", like paper files, can be poorly identified and lost or made difficult to retrieve. Furthermore, information kept electronically loses its value and needs to be systematically destroyed just as paper-based information does. A cluttered and disorganized computer hard drive or disk affects the efficiency of office operations just as a cluttered and disorganized file cabinet would. These problems are analogous to traditional records management problems and therefore can be resolved by properly applying traditional records management principles to electronic records.

#### **The IMOSA Project**

The National Archives of Canada has been at the forefront of the application of records management to electronic documents. The Information Management and Office Systems Advancement (IMOSA) project, under the direction of John McDonald, has, since its establishment in December 1989, developed a series of functional requirements and management procedures for electronic records generated on office systems.

The first phase of the IMOSA project was based on a partnership between the National Archives, the federal Department of Communication and a private company known as Provenance Systems Inc.<sup>1</sup> This phase developed and tested a prototype records management application which was installed on the local area network (LAN) in the Government Records Branch of the National Archives. The prototype was available through a list of LAN menu options and provided users with tools to file, browse, search and retrieve the holdings of the Government Records Branch, while also allowing the records manager to control and manage both electronic and non-electronic holdings.<sup>2</sup> Much of the departmental subject classification system was downloaded to the file server to ensure that consistency could be maintained between the hard copy and electronic corporate holdings.<sup>3</sup>

It quickly became apparent that it would be difficult to convince computer users to abandon individualized approaches to naming computer files and organizing directories and to move towards a coordinated filing system. A guide on managing computer directories was produced to provide advice to users on how they could build and use file directories to “respond to their individual needs but in a manner that is both consistent across the organization and in line with the corporate approach to subject clarification”.<sup>4</sup> This guide is one of the more important results of the IMOSA project.

### **Directory Structure and Naming Conventions**

To manage electronic documents effectively, a standard system for organizing and naming documents is first necessary. The first level of organization, in a typical office environment, should be the directory structure.



The directory system is most often compared to a tree, with directories and sub-directories branching off from the main, or "root" directory resulting in a hierarchical structure.<sup>5</sup> For the more general topics in the hierarchy of information, directories branching from the root directory are created. Then, sub-directories are created under each directory to break down the topics further and help with the storage and retrieval of individual documents.<sup>6</sup>

The IMOSA project established guidelines for designing the structure for electronic directories. These guidelines are:

- That the structure should be simple and logical.
- That the arrangement of the directories should proceed from the general to the specific.
- And that clear and consistent terminology needs to be used when naming directories and files. This will permit the creator as well as other users to quickly identify and retrieve documents.<sup>7</sup>

The "program/activity structure" model is the approach for organization advocated by the IMOSA project.<sup>8</sup> This model provides an excellent approach for the structuring of directories as it reflects the organization's programs, activities, sub-activities and individual tasks. The programs and activities follow a hierarchical arrangement, which is easily adapted to the directory/sub-directory hierarchy.

These principles formed the basis of recommendations made to the Director of Libraries in August 1995.<sup>9</sup> This report recommended that the Libraries Administration office establish a shared directory to serve as a centralized filing system for commonly used electronic documents. This directory

would be divided into several sub-directories, each reflecting the different functions performed within the office. The key functions of the Libraries Administration office include human resources, finance and planning, and public relations/service. Each of these functions would have a sub-directory which could then be further broken down by the various subjects that fall under that functions responsibility. This, in essence, is the program/activity structure model proposed by IMOSA.

It is within these subject, or second-level directories, that individual electronic documents would be stored. The development of naming conventions to aid in the identification of electronic documents is the second essential step toward the establishment of an effective electronic filing system. A uniform and logical directory structure is of little use if the user is unable to decipher the names of individual electronic documents. Established conventions for naming directories and files ensure that documents can be easily and quickly located and allows employees to recognize documents that others may have filed.<sup>10</sup> The report to the Director of Libraries did not go into detail about the naming of individual documents. Obviously the names chosen should reflect as closely as possible the existing names used for paper documents. This would ensure consistency between the paper and electronic record.<sup>11</sup>

The development of a directory structure and the use of naming conventions for directories and individual electronic files is akin to the development of subject-block filing systems in paper-based records management. As with subject-block filing, the approach proposed above can resolve problems in electronic records management that are analogous to the traditional management problems of clutter and misfiling. Interviews with

Libraries Administration staff, prior to the writing of the report, indicated that there was concern over the growing clutter on work station hard drives. There are, however, other challenges which paper-based records management programs do not encounter. Key among these, as identified in chapter one, are physical fragility, dependence on computer hardware, and incompatibility of differing computer hardware and software systems.

### **Archival Involvement at the Beginning of the Record's Life Cycle**

Physical fragility has never been as significant an issue with paper documents as it is with electronic records. Paper is a relatively stable medium which can be stored under almost any circumstance for long periods of time. This however, is not true of electronic information. Magnetic and other recording media are far more volatile than paper. They need to be kept in controlled circumstances to protect against excessive heat, cold, dust, and magnetic fields.

The dependence on computer hardware to view electronic information creates a further problem in the maintenance and use of electronic records. New computer systems, storage formats, and software programs appear and disappear with astonishing rapidity. For example, while optical disks may last for 25 to 30 years, the hardware and software needed to access the information may be outdated in as little as 10 years.<sup>12</sup> The obvious example is the 5 1/4 inch computer diskette. Information stored in this format is still readily readable but it is getting harder and harder to find a compatible disk drive to do so.

In addition, not all current systems are compatible. Computer hardware and software marketed by different vendors is often incompatible without undertaking conversion procedures in which information may be lost.

These are complicated problems, particularly when the goal is long-term preservation of records. The first step that archivists need to take is to reaffirm their authority in managing these types of records. A good archival program will have a policy statement mandated by the highest policy making body of the organization. A well written policy statement will grant the archivist responsibility for records regardless of form. However, many within an organization may not realize this and naturally assume that responsibility for the computer record resides with those assigned to maintaining the hardware and software (i.e.: the computer services department). Or, the assumption may be that the computer record is the responsibility and property of the individual who creates it.

An electronic records policy needs to clearly define what is to be considered a record. Business records, whether on database, e-mail, spreadsheets, or word processing software, need to be defined. The wording of the policy should not, however, limit the electronic record to these forms. Instead the statement should be sufficiently broad with the forms provided only as examples. For instance, an organization's definition of record may be as follows:

Documents include any paper, record, or other documentary material, regardless of physical form and characteristics, made or received by any authority, department, or officer of the organization and which relates to the business of the organization.<sup>13</sup>

The electronic records policy should restate the definition of a record and then indicate examples of records in the electronic form. For example:

Electronic documents include, but are not limited to: data files in databases; image files; full text (word processing) files; electronic spreadsheets; multimedia records; and e-mail and fax files.

The electronic records policy should also provide the archivist with representation on any committee or planning group that develops the specification for any new computing systems that the organization will acquire. This will allow for archival issues to be considered up front by allowing the archivist to work with systems technology people and make them aware of archival concerns. Some of these concerns can then be addressed immediately by ensuring that records management tools are built into the design of the system or clearly specified in any tender information. Procurement practices also need to address costing for the migration of legacy data. This would mean that any analysis related to a system upgrading would include, as a matter of routine, the costs associated with migration. Such a procurement policy would have benefits beyond purely archival considerations as much of the data that would be converted would continue to be quite current for at least a few years and potentially could be crucial to on-going operations and current information requirements.

Also when new systems are implemented, a determination on the value of the records the system is likely to keep and a retention schedule can immediately be made before the first record is even created. This characteristic, the early involvement of the archivist in the life cycle of the record, is the single most important change that is being wrought by the electronic document.

Traditionally archival appraisal has been done at or near the end of the records life cycle of creation, active use, semi-active use, and disposition. Even record schedules, which usually indicate the time periods that records need be kept in the creating office, the records centre, and then transferred to the archives, place the archives at the end. Archival appraisal may not occur until years after a document has been created. Such a state of affairs is not possible with the electronic document. The physical fragility and volatility of the recording medium makes appraisal at or near the creation of the record fundamental.

For example, the National Archives of Canada has become increasingly involved at the early stage of the life cycle of records. The work of IMOSA assists government institutions with managing their electronic documents long before the records are brought under the custody and control of the archives. Given the vast amount of records, both traditional and electronic, that the National Archives has responsibility for, it adopted, in 1990, a strategic approach to records acquisition represented by Multi-Year Disposition Plans (MYDPs).<sup>14</sup> These plans are negotiated with targeted federal institutions considered to create records of significant archival value. For the first time, all media, including electronic records were appraised in context, leading to better appraisal decisions, and less custodial work. One obvious result of this strategy was that for the first time electronic records of all types and formats were to be appraised in a systematic fashion long before their transfer to the National Archives.<sup>15</sup>

The National Archives has prepared numerous documents to guide archivists in their appraisal of electronic records. In these, electronic records are not considered as being distinct and separate but rather as part of the larger whole. Providing that the electronic records under consideration have sufficient

archival value to warrant preservation, the material is designated as archival. The terms and conditions of transfer either provide for the records to be transferred to the National Archives or to stay in custody of the creator under a monitoring agreement.<sup>16</sup> Since the implementation of MYDPs a number of types of electronic records have been designated as archival and have been scheduled for eventual transfer to the National Archives. These include:

- simple databases
- relational databases
- word-processing files
- spreadsheets
- correspondence tracking systems
- data modeling systems
- automated office systems
- geographic information systems (GIS), and
- computer automated drawing (CAD)<sup>17</sup>

This is only the beginning. In the near future, the National Archives is expected to begin to appraise new types of electronic records. Multi-media documents and systems, side-looking aperture radar (SLAR) imagery, and digital imagery are all examples of what will be encountered.<sup>18</sup>

Once it has been determined that the information contained in a system has archival value, the National Archives conducts a technical appraisal. Technical appraisals document the operating system on which the records reside, the software used to create/modify the records, and the quantity of records to be transferred. Although past technical appraisals were not as detailed as they could have been, they now assess file types, existing documentation (including metadata), original platform, technical description of the records, and the readability of data. They also evaluate whether functionality

will be preserved or lost and, ultimately, recommend whether the National Archives is in a position to accept, refuse or monitor the records from a purely technological perspective.<sup>19</sup> It is hoped that a more thorough investigation of systems at the appraisal phase will solve custodial problems experienced by the National Archives in the past, such as acquiring unreadable data, insufficiently documented systems, or the transfer of data other than that identified during the archival appraisal.<sup>20</sup>

Not all archivists have the luxury of beginning from scratch. Electronic records no doubt will already exist in the organization and, armed with the electronic records policy statement, and representation on the committees responsible for the creation and implementation of new systems, the archivist should begin to conduct an inventory of existing records and record keeping systems. This may be done in connection with a larger inventory program which would include paper records as well as those in other media. In most cases it is desirable to do this as interconnections and duplications between paper, electronic, and other media series will be discovered in this way.

Typically, inventories are conducted on a department by department basis and consist of collecting descriptive data concerning each record series. A record series is a group of identical or related records that are normally maintained as a unit. This approach is problematic for electronic records. Electronic records tend to be resident in individual user directories, commonly with a lower level of organization than items in individual paper filing systems. In such cases the inventory may need to be conducted on a computer-by-computer basis.



Inventory strategies and procedures for paper records have long been defined, refined, and widely accepted. Inventory techniques for electronic records will resemble those utilized for paper and photographic records but the distinctive characteristics of electronic records – especially their machine-readable content and dependence on specific configurations of hardware and software – require special consideration.<sup>21</sup>

A questionnaire should be designed and circulated to the targeted individuals and units. Alternatively archival personnel can meet with individual unit staff to conduct a physical survey of the records.

The questionnaire needs to be designed to capture all the information needed to properly control and manage the record. Traditional inventories usually ask for the following kinds of information:

- department or organization name
- name of the record series
- purpose or description of the records series
- location, and
- method of storage

While the design of the survey instrument will ultimately depend on the objectives established prior to the commencement of the inventory, questions reflecting the theoretical outlines of David Bearman and Charles Dollar, discussed in earlier chapters, need also be asked. Such questions will ascertain the level of “recordness”, or how well the information will be able to stand as evidence of actions. Poorly designed systems can then be recognized and actions taken to redesign them before neglect of the record causes problems for

the organization. The following information should be solicited in an electronic records survey:

- name of the record series
- purpose or description of the records series and if the records are maintained in another medium
- dates covered
- physical extent and description of storage medium
- media recording date
- quality of the media storage environment
- hardware and software required to access the records, and
- listing of the audit procedure<sup>22</sup>

The name, purpose and description of the electronic record series is necessary to properly identify the records and prevent loss or misplacement. Collection of the outside dates of the records furthers this identification process. This information is the same as that collected with paper record inventories, and the information serves the same purpose. Physical extent and description of storage medium, however, takes on an added importance for electronic records and the inventory must include a detailed description of the physical and technical characteristics of the storage media. The type of medium used needs to be indicated as well as the recording format.<sup>23</sup> The recording date is also an important piece of information to collect as electronic records that will need to be maintained for longer periods of time will need to be recopied or reformatted as the storage media deteriorates.

Physical fragility is complicated by the quick technological obsolescence and incompatibility of computer hardware and software systems. The inventory will need to collect information on the hardware and software used to produce and view records. This information will be vital when the organization is planning

to upgrade or purchase new hardware and software systems. Information collected during the inventory will indicate which record series will need to be converted to new formats to remain usable. This information can then be built into the cost analysis for the purchase of new computing tools.

Finally, the inventory will need to collect information on which record series maintain or, at least, have the ability to maintain audit trails and transaction logs. A transaction log is an automatic recording of what information has been altered, when it was altered, and, in some instances, by whom it was altered.

Spreadsheets and databases have a complicated existence because the information in them changes and evolves constantly over time. Adequate information regarding input procedures and the ability to maintain logs and audit trails needs to be known. If the software is incapable of maintaining transaction logs, this information is vital as well. Records that are vital to an institution's operation and which may involve the institution in litigation must have adequate logs and audit trails maintained. It is by using the transaction log that a database can be reconstructed to appear as it did at any point in the past (as long as the transaction log goes back to that point) and it is by using audit trails that the authenticity of any change can be reasonably determined.

The scheduling of electronic records should proceed in the same manner as that employed for traditional paper documents. Broadly defined, a retention schedule is a list of the record series maintained by all or part of an organization. Retention schedules may be general or program-specific in content. General schedules enumerate retention periods for specific record

series without regard to the particular program units where they are maintained. They provide one set of retention guidelines for an organization as a whole. A given program unit will maintain some, but not all, of the record series enumerated in a general schedule. Program-specific retention schedules, in contrast, are limited to those record series maintained by a particular program unit. Sometimes described as activity-oriented retention schedules, they are custom-prepared for each program unit. General and program-specific schedules are not mutually exclusive options. They can coexist in a given organization. Both types are applicable to electronic records.<sup>24</sup>

Regardless of format, a retention schedule for electronic records will indicate the period of time that each series is to be retained, the physical storage medium, the location where the records are to be stored, the date and method of final disposition or transfer instructions if disposition is not authorized. The hardware and software manuals should also be included on the schedule as they are important in ensuring access to the records. Finally, the fragility of the recording medium necessitates that a period be set after which record series must be recopied onto new media to prevent loss. The schedule now becomes a tool for retention, recopying, and final disposition.

### **Electronic Archives: Custody-Based Models**

At final disposition electronic records and documents with continuing value need to be transferred to the archives. The unique circumstances of electronic recording media described above, such as physical fragility and the trend to quick technological obsolescence, make traditional archival transfer difficult. Thus numerous archival theorists have advanced the idea that archives

should give up their traditional custodial role and concentrate their energies on monitoring record creators. Archives should, as David Bearman has argued,

re-examine the program structures and methodologies which served them reasonably well up until a generation ago but within which they still largely practice their craft. In a time of “re-inventing” government and organizations, archivists would be well served by thinking through alternatives to their current methods.<sup>25</sup>

Bearman advocates what is alternatively known as the “distributed custody” or “post-custodial” approach. In this model only the functions of providing record keeping advice, appraisal, and possible description are carried out by the archives.<sup>26</sup> All other archival operations, including custody, preservation, and reference service, are performed by the creating agency. The archival institution assumes no responsibility for the actual preservation of electronic records of continuing value, other than monitoring agency compliance with archival standards for preservation. Ultimate responsibility is devolved to the creating agency, its successors, or its delegates. Supporters of this approach argue that it makes technological sense to leave software-dependent records in the hands of the creators, because they are most likely to be able to maintain access to the records through forward migration.<sup>27</sup>

The theories of David Bearman have had appeal in Australia, but American and Canadian archives have followed a more careful approach, creating instead an amalgam of the distributed custody and custodial models. In this model, some electronic records are acquired and preserved by the archives and others are retained and preserved by the creating agency. The archives neither assumes ultimate responsibility for all the records, nor does it devolve all responsibility to the creating agencies. Rather, decisions as to the custodial

future of electronic records are made in cooperation with creating agencies according to the degree of appropriateness of the custodial strategy to a particular series of electronic records.<sup>28</sup>

This hybrid approach, however, falls victim to many of the same difficulties encountered in the post-custodial model. An abdication of responsibility for some records is still an abdication of responsibility and brings into question the purpose behind an archives just as the full post-custodial approach does. Most frightening to the archival purist, however, is that these two approaches undermine the basis of the entire archival endeavor.

Supporters of the traditional custodial approach believe that taking electronic records out of the context of the creating agency and into the control of the archives is the only way to imbue the records with true archival value. Ken Thibodeau, of the American national archives, has written that there must be a “categorical separation between the operation environment in which records are originally created and the archival environment,” and that “archival value is not only enduring value; it is value apart from the original context.”<sup>29</sup> The archival environment, according to Thibodeau, is one in which there are “adequate controls to guarantee that records will be preserved and that they will not be altered.”<sup>30</sup> No less an archival paragon than Sir Hillary Jenkinson, writing in the first quarter of this century, provided the moral defense of archives as repositories of impartial evidence and his vision of the archivist as guardian of that evidence “without prejudice or afterthought, for all who wish to know the Means of Knowledge”<sup>31</sup> has become the clarion call of the archival profession.

Being separate from the creation and use of the document, and thus not having any stake in its interpretation, allows the archives to serve in this impartial role as protector of the evidence. Despite the most eloquently written monitoring agreement, there is no assurance that the creating agency will be able to act both as interested party and impartial custodian at one and the same time. The response of post-custodialists has always been to raise the specter of technology and the perceived inability of archivists to preserve the record in its shadow. There is, however, the possibility of a third and, in many ways, new option for the long term preservation of electronic records. This approach centres not on the custody of but on responsibility for the record. For institutions such as the University of Manitoba, which manage their computing systems along the lines of a corporately centralized model, this approach is particularly well suited.

### **Electronic Archives: The Responsibility-Based Model**

Custody of electronic records in the responsibility-based model remains with the archives. Once an electronic record keeping system is deemed to contain records of long-term evidential value, through the process of committee/design representation, survey, and scheduling examined earlier, copies of the system's records and its audit logs would be periodically transferred to the custody of the archives. Once transferred, however, the creating agency would maintain some responsibility toward the record. This responsibility would be to ensure that the record remains accessible over time. Thus, when the creating agency upgrades or replaces its computing system, it would have a formal obligation to ensure that records previously deposited with the archives are either compatible, converted to be made compatible, or no

longer possess evidential or historic value and should be discarded. In this manner, the specter of technology, which so haunts the "post-custodialists" is somewhat tamed. At one and the same time, however, the issue of preserving impartial evidence, the fundamental principle behind all modern archives, is upheld.

Perhaps many electronic archives will develop along these lines. The rather haphazard and decentralized communications and computer systems implementation which has been undertaken by major government institutions, and which has prompted the development of the post-custodial option, is not necessarily the pattern for many smaller, but still sizable institutions such as the University of Manitoba. Nor is it certain that these governments will continue along the decentralized path as they too might reconfigure their computer systems management along the lines of a centralized service model. The responsibility-based model may provide guidelines for their electronic archiving strategies. But before we turn to outlining such a strategy for the University of Manitoba, let us first consider the issues of access and use and the effect of the computer and electronic archives on them.

### **Research and Use**

Since the French Revolution, access to archival documents has been one of the fundamental tenets of archival theory and application. The principle of the accessibility of archives to the public was proclaimed by the decree of 24 April 1796 which established the *Archives nationales*, and stated that, "Every citizen is entitled to ask in every depository... for the production of the documents it contains".<sup>32</sup> The opening of the archives was part of a much wider movement to



enable the new revolutionary citizen to play a proper role in a property-owning democracy based on markets. Such developments were not confined to France. In anti-revolutionary Great Britain similar principles were given institutional form in the course of the 19th century. The Public Record Office, established under the 1838 Public Records Act, was originally conceived as a repository for the safekeeping and public use of the legal records of the state.<sup>33</sup> The "public records" were to be a repository of material in which citizens could establish their legal right to property.

As we have seen in chapter one, the staffing of these new public archives was soon dominated by the historian, who also proved to be the primary client. Research, as defined and practiced by the German historian Leopold von Ranke, became a central part of what the historian/archivist saw as his, and later her, proper role. This conception has changed little since the mid-19th century. Today archival reference services are still geared toward the historian, or at least the scholarly researcher, although the largest group of users tend to be administrative users, genealogists, and other, non-historically trained researchers such as lawyers, writers, and the like.<sup>34</sup> When the Archives of American Art at the Smithsonian Institution surveyed 416 of its users in the early 1980s, it found that only 13 percent were academic faculty, while 43 percent were students. But surprisingly 31 percent -- nearly one third -- of the archives' users were private individuals researching their own art holdings, doing genealogy, or simply looking.<sup>35</sup>

Speaking at the annual meeting of the Society of American Archivists in 1982, Elsie Freeman, then Director of Academic, Professional, and Public Programs at the National Archives and Records Service of the United States,

argued that archivists have failed to recognize this shift in their clientele. "[W]e tend to be cool to the user who is not professionally trained to do research", Freeman said:

This category probably includes most of our clientele. We favor the researcher who understands, or at least does not question, our organization of the records; who is willing to do labor-intensive work to uncover the nugget he seeks; whose experience is such that he is able to use our categories of description and who can spend time browsing, a research activity that is rapidly becoming a luxury for many.<sup>36</sup>

Even among historians, whom many archivists still view as their primary clients, there has been a shift away from the traditional Rankean methodology of exhaustive primary research. Quoting a survey of American historians conducted to determine which resources were most often utilized in research, Freeman showed that for one half of respondents books and periodicals were the most frequently used items, with manuscripts running third.<sup>37</sup> Other formats that archivists consider to be primary sources, such as films, maps, photographs, microfilms, and computer printouts, ranked anywhere from seventh to thirteenth place.<sup>38</sup> Ultimately those formats seen by historians as the least convenient to use were the least used.

Freeman's warning to archivists about their changing client base and about the changing methodology of what archivists perceive to be their client base, has gone largely unheeded. But while the identity of the user remains in the background, the question of access has not. In their landmark 1985 article, "The Power of the Principle of Provenance," David Bearman and Richard Lytle argued that provenance-based retrieval, centered on a study of form, function,

and context of creation was superior to both subject and content based methods of archival access.<sup>39</sup> Retrieval according to provenance proceeds by linking subject queries with provenance information contained in administrative histories and biographies. This produces leads to files which then may be searched by using the internal structures of those files.

A user thus poses a subject question for which the archivist retrieves information by relating the subject to the activities of the organization. The archivist translates the user's subject question into terms of organizational activity. This, Bearman and Lytle argue, is in essence an inferential process in that the archivist infers from provenance information which organizational units might have "undertaken relevant activities and therefore might have produced documentation pertinent to the subject query at hand".<sup>40</sup>

The following example illustrates this inferential process. A researcher enters a university archives, in this case the University of Manitoba Archives, and asks for the original of an aerial photograph that was reproduced in a booklet marking the 75th anniversary of the University. The researcher has no information on the photograph that he wants. The booklet contains no source information either. How is the archivist to proceed?

The archivist would be able to infer, to use Bearman and Lytle's terminology, that since aerial views of campus were usually taken for public relations purposes, the most logical place to search for the photograph would be in the photograph collection of the university office responsible for public relations. Using the finding aids for this collection it would now be a rather

straightforward matter to isolate all aerial views of the university taken in the 1930s.

The provenance method of retrieval obviously rests on a detailed understanding of both the structure and processes of the organization which created the records.<sup>41</sup> Bearman and Lytle propose to use this provenance information as a means of providing "retrieval access points" to the records. Because "archival records are the consequences of activities defined by organizational functions," they argue, "such a vocabulary can be a powerful indexing language to point to the content of archival holdings".<sup>42</sup>

A more detailed examination of functions as an indexing language was provided by Chris Hurley in 1993. Drawing on the work of Stephen J. Gould, a natural historian, Hurley indicated that approaches to classification in the natural world could greatly "enlighten" archivists' understanding of relationships between functions.<sup>43</sup>

The language of functions, and Hurley does seem to treat it as a type of language, provides "a quarry of indexable headings".<sup>44</sup> These headings facilitate the retrieval of information about organizations and the records that they produce. To be effective, however, the language of functions must be controlled and standardized because "a language which is imposed over a body of records of any scope or complexity must achieve some level of consistency to be of any practical use".<sup>45</sup>

It may be argued that the development of a "language" of functions is analogous to the development of the alphabet and writing in ancient times. The

earliest record keeping systems were the cave paintings produced by Neanderthal man. These paintings represented a one to one recording of information. A painting of an animal was intended to be a replica of that animal. The first step towards abstraction occurred when clay tokens began to be used to represent objects. The token was no longer an exact replica of the object but they still represented a one to one recording of information.<sup>46</sup> Further steps toward abstraction occurred when single tokens were developed to represent multiples of things. Eventually the use of tokens faded away and a further abstraction occurred. The physical object of the token was itself replaced by symbols written on clay tablets which eventually developed into writing.

All of these steps of abstraction, from the physical object to the abstract written representation of that object, were efforts by people to cope with information as it became more and more numerous and complex. In the same way archivists face an information explosion today and need to develop methods to cope with the ever growing body of documentation. Metaphorically speaking, archivists need to find an archival form of the alphabet – a simple and powerful tool to represent information. At this early stage, the use of contextualism appears to be the best hope to parallel the information management breakthrough of ancient civilization.<sup>47</sup>

Functional indexing is greatly facilitated by the computer. The computer is in fact necessary. While the indexing of corporate or government services remains a relatively simple task, as most activities of administrative units can be described with four or five function terms,<sup>48</sup> the problem faced is the complexity of individual human activity. Individual creators have many roles in their lives and these are reflected in the documents they create. Such a complex indexing

system, in order to remain efficient and accurate, must use a computer. To extend our analogy with ancient civilization, the computer is as necessary to functional indexing and provenance-based retrieval as the clay tablet, papyrus, and the quill pen were necessary to writing.

The computer will not only affect access, it shall also have an effect on use. Computer hardware costs are declining as their power is increasing and there are no clear signs that these trends are likely to abate. Breakthroughs in computing and telecommunications make possible the transmission of an incredible amount of information at phenomenal speeds. The United States, Canada, and numerous other industrialized countries are taking major steps in transforming the Internet and their cable and telecommunications networks into an "electronic highway" as significant in scope and as important in consequences for communications as the development of highways was for transportation. Technology may thus make possible a future which once we only dreamed of -- instant access to information. Delivering his 1996 inaugural address as president of the Society of American Archivists, Nicholas Burckel painted a vision of the future in which increasingly more recent archival material will be sought. "The ideal in this information-intensive environment is that relevant information is available to users when and where they need it."<sup>49</sup> Burckel continues:

Major archival functions -- appraisal, arrangement and description, reference, preservation -- may not change, although the way those functions are practiced, will. What is changing is the delivery of services -- reducing the physical constraints of time and place.<sup>50</sup>

The computer thus provides for a revolution in the reference function of archives. Physical location will increasingly become irrelevant to the researcher as the possibility of downloading reference and finding aids through the Internet, and eventually the downloading of the documents themselves, begins to develop.

No longer will research be limited to those with the time and money necessary to travel to distant archives to "mine" the records in the traditional Rankean fashion. This, as Freeman states, is not how research is done anyway. As archives develop more user-friendly reference strategies the numbers of researchers will increase. Non-historically trained researchers such as lawyers, writers, and genealogists will find the archives more accommodating and the increase in clientele will justify continued funding in these economically stringent times.

These changes are already beginning to occur. The number of Canadian archives with website homepages is significant. These websites are becoming more and more detailed as to the information that they provide. Projects like the Archives Network of Alberta and the British Columbia Union List provide researchers with fonds-level description to the majority of archives in their respective provinces. The British Columbia project is already on the Internet and the Alberta network is soon to follow suit. The University of Alberta Archives launched a website in October 1996 which included a complete guide to its holdings. Researchers are encouraged to utilize this guide to conduct their preliminary research before visiting the archives. It will soon be possible for researchers, after consulting this guide, to obtain finding aids to further pinpoint their research. Then the researcher may either visit the archives, hire a local

researcher, or obtain photocopies of requested files. It will thus be possible to do research without travel to the archives, in the comfort and convenience of one's own study anywhere in the world. These are the first steps to the future as envisioned by Burckel.

Furthermore, once archival documents themselves are available on the Internet, archivists will be able to preserve rare and fragile documents without denying access to those who wish to study them. The British Library, for example, holds the only medieval manuscript of *Beowulf* in London. Only qualified scholars were allowed to see this rare document until Kevin Kiernan of the University of Kentucky scanned the manuscript and put the images up on the Internet for anyone to peruse. Tokyo's National Diet Library is similarly creating highly detailed digital photographs of 1,235 woodblock prints, scrolls, and other materials it considers national treasures so that researchers can scrutinize them without handling the originals.<sup>51</sup>

Libraries are at the forefront of the digitization movement. The Libraries of Cornell and Harvard universities have launched ambitious digitization projects and the Library of Congress in the United States intends to digitize five million items by 2000.<sup>52</sup> The Canadian Institute for Historical Microreproductions recently announced a digital project that will make early works of Canadian literature, native studies, and women's history accessible on the Internet. The project, known as Early Canadiana Online, will be jointly undertaken by the institute and the National Library of Canada, the Université Laval Library, and the University of Toronto Library. The objective is to digitize five thousand works of early Canadiana by September 1999. Archival endeavors at digitization have been far smaller in size and number. Nevertheless, even at this early stage



archival documents are available on the Internet. Seminal documents, such as the Magna Carta, the American Declaration of Independence, the French Declaration of the Rights of Man, and others are available as are collections relating to specific subjects such as the First World War. From the researchers' point of view, Archives and Libraries may seem indistinguishable in the future. Both will provide information on demand and the researchers, sitting before their computer terminals, will care little if that information originates from a library or an archives. But at the other end of the computer connection, there will be a difference. Archives exist to preserve evidence of past actions. This concept is fundamental and it is essential that it remain so.

## Endnotes

1 John McDonald, *Information Management and Office Systems Advancement (IMOSA)*. (Ottawa: National Archives of Canada, 1993), p. 3.

2 Ibid.

3 Ibid.

4 Ibid., p. 6.

5 *Managing Shared Directories and Files: Exposure Draft* (Ottawa: National Archives of Canada, 1995), p. 6.

6 Ibid., p. 7.

7 Ibid.

8 Ibid., p. 8.

9 Mark Vajcner, *Proposed Electronic Records Management Procedure for the University of Manitoba Libraries* (August 1995), pp. 2-3. See Appendix for the full text of this report.

10 *Managing Shared Directories*, p. 8.

11 Vajcner, p. 3.

12 Jeff Rothenberg, "Ensuring the Longevity of Digital Documents" in *Scientific American* (January 1995), p. 44.

13 Based on the definition of "document" found in *University of Alberta: Document Retention and Disposal Policy* (1974).

14 Ann Martin, *Report on the Status of the Electronic Records Program at the National Archives of Canada* (Ottawa: National Archives of Canada, 1996), p. 4.

15 Ibid., p. 4.

16 Ibid., p. 8.

17 Ibid.

18 Ibid.

19 Ibid., p. 9.

20 Ibid.

21 William Saffady, *Managing Electronic Records* (Prairie Village, Kansas: ARMA International, 1992), p. 71.

22 Compiled from various sources. These include Saffady, p. 76 and David Bearman, *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations* (Pittsburgh: Archives & Museum Informatics, 1994), p. 297.

23 Saffady, p. 78.

24 Ibid., p. 86.

25 David Bearman and Margaret Hedstrom, "Reinventing Archives for Electronic Records: Alternative Service Delivery Options" in Margaret Hedstrom (ed.), *Electronic Records Management Program Strategies* (Pittsburgh: Archives and Museum Informatics, 1993), p. 82.

26 Sheila Powell, "Elements of an Archival Electronic Records Program" (Ottawa: National Archives of Canada, 1995), p. 14. For a full discussion of the post-custodial approach see Chapter One on this thesis.

27 Ibid., pp. 14-15.

28 Ibid., p. 17.

29 Kenneth Thibodeau, "To Be or not To Be: Archives for Electronic Records" *Archives and Museum Informatics Technical Report 13* (1991), p. 3.

30 Ibid., p. 12.

31 Terry Cook, "Archives in the Post-Modern World: The Interaction of Archival Theory and Practice Since the Dutch Manual of 1898" XIIIth International Congress of Archives (Beijing, 1996), p. 6.

32 Edward Higgs, "From Medieval Erudition to Information Management: The Evolution of the Archival Profession", Second Plenary Session: XIIIth International Congress of Archives (Beijing, 1996), p. 2.

33 Ibid.

34 Elsie T. Freeman, "In the Eye of the Beholder: Archives Administration from the User's Point of View" in *American Archivist* Vol. 47, No. 2 (Spring 1984), p. 113.

35 Ibid., p. 115.

36 Ibid., p. 113.

37 Ibid., p. 114.

38 Ibid.

39 David Bearman and Richard Lytle, "The Power of the Principle of Provenance" in *Archivaria* 21 (Winter 1985-86), pp. 14-27.

40 Ibid., p. 16.

41 Ibid.

42 Ibid., pp. 21-22.

43 See Chris Hurley, "What, If Anything Is a Function?" in *Archives and Manuscripts* 21 (November 1993), p. 208.

44 Ibid., p. 209.

45 Ibid.

46 See Denise Schmandt-Besserat, "From Accounting to Written Language: The Role of Abstract Counting in the Invention of Writing" in B.A. Raftery and D.L. Rubin (eds), *The Social Construction of Written Communication* (Norwood, N.J.: Ablex Publishing, 1988).

47 This analogy was developed by Prof. Tom Nesmith and enunciated in his classes at the University of Manitoba.

48 Hurley, p. 212.

49 Nicholas Burckel, "Archivists Facing the Millennium: Preparing for an Unknown – but not Unknowable – Future" in *SAA Archival Outlook* (January February 1997).

50 Ibid.

51 Michael Lesk, "Going Digital" in *Scientific American* (March 1997). The text of this article was obtained via the Internet from <http://www.sciam.com/0397issue/0397lesk.html>

52 Ibid.

## Conclusion

The concept of preserving records as evidence of past actions, and the importance of this concept to archival theory, necessitates that archives maintain their traditional custodial role. Custody, as we have seen, is complicated by the ephemeral nature of new electronic recording media and technologies. Numerous archival theorists have considered the shape of future archives and the effect of the computer upon them. A great many of these theorists have concluded that at some point archives and archivists will need to relinquish many of the functions that they now perform and redefine themselves and their profession. But, as we have seen in preceding chapters, the computer is not the nemesis that it has been made out to be. Far from it. It provides the opportunity to greatly increase our indexing and retrieval abilities, as demonstrated by David Bearman, Richard Lytle, and Chris Hurley. It may also provide, with the increasing use of the Internet, researchers with reference services and options that would have been unimaginable only a decade ago. With regard to the actual archiving of electronic records, this too does not seem to be an impossible prospect provided archivists, information technologists, and record creators recognize the importance of the record and cooperate to preserve it.

The immediate role of archives, therefore, should be to foster awareness of the importance of the record. Archives need to impress record creators and information technology specialists of the importance of maintaining concise and

accurate records for evidential purposes. The importance of records for administrative, legal, and research purposes must be emphasized as must the archives' traditional role in this function. This awareness needs also to be extended to University administration.

### **Electronic Records Management**

The University of Manitoba defines university records as “any records or documenting material, regardless of physical form or content, made or received by any officer, authority or department of the University that relate to the University and its business”.<sup>1</sup> The Archives provides a wide range of services as part of its ongoing effort to acquire and preserve the historically significant records of the University of Manitoba. These services include records surveying, analysis, and scheduling. The Archives needs to extend these records management services to the electronic record. The management strategies, discussed earlier in connection with the IMOSA project, and forming the basis of recommendations made to the Director of Libraries<sup>2</sup> could form the basis of such strategies. Ultimately, records management strategies will need to be adapted to the conditions of each individual record creator, but the basic principles, which are little different from the basic principles of traditional records management, will remain the same.

### **Initial Inventory**

Electronic record systems of long-term value no doubt already exist within certain University units. These systems need to be identified. The most common and effective method is the undertaking of an inventory of existing records and

record keeping systems. While the design of the survey instrument will ultimately depend on the objectives established prior to the commencement of the inventory, questions to ascertain the level of “recordness”, or how well the information will be able to stand as evidence of actions will need to be asked. Poorly designed systems can then be recognized and actions taken to redesign them before neglect of the record causes legal problems for the University.

### **Archival Representation at the Systems Development Stage**

The University Archivist should have representation on any committee or planning group that develops the specification for any new computing systems that university units acquire. This will allow for archival issues to be considered up front by allowing the archivist to work with systems technology people and make them aware of archival concerns. Some of these concerns can then be addressed immediately by ensuring that records management tools are built into the design of the system or clearly specified in any tender information.

When new systems are implemented, a determination on the value of the records the system is likely to keep can be made. Thus a retention and disposition schedule can be agreed to by the Archives and record creator even before the first record is produced. Traditionally this process of archival appraisal has been done at or near the end of the records life cycle of creation, active use, semi-active use, and disposition. Even record schedules, which usually indicate the time periods that records need be kept in the creating office and then destroyed or transferred to the archives, place the archives at the end of the cycle. Archival appraisal may not occur until years after a document has been created. Such a state of affairs is not possible with the electronic



document. The physical fragility and volatility of the recording medium makes appraisal at or near the creation of the record fundamental.

### **Archival Transfer and Record Creator Responsibility**

Once an electronic record keeping system is deemed to contain records of long-term evidential value, copies of the system's records and its audit logs would be periodically transferred to the custody of the Archives. Where possible the archival copy of permanently valuable electronic records should be in read-only format.

Hardware and software is needed not only to read an item but also to determine what an item is. Therefore all electronic record media need to be properly documented before transfer to the Archives. This documentation should include:

- name of the record creator;
- record keeping system title -- name by which an electronic filing system is known to the university unit that creates or maintains it;
- date of creation;
- hardware and software requirements and the type of storage media;
- instruction on how to access the record system;
- context description; and
- supporting files -- listing of any electronic or other files that support the utilization of these records. Some computer data files, for example, contain pointers to other specified files. Knowledge of these relationships is essential to future efforts to use the data.

Once transferred, however, the record creator would maintain some responsibility toward the record. This responsibility would be to ensure that the record remains accessible over time. Thus, when the record creator upgrades or replaces its computing system, it would have a formal obligation to ensure that records previously deposited with the Archives are either compatible or converted to be made compatible, or the agency must show that the records no longer have evidential or historic value and should be discarded. The Archives will need to develop policy to provide for the conclusion of formal agreements with record creators to ensure that obligation is met. Also, to ensure that researchers have access to computing systems to view records, special research access agreements will need to exist between the Archives, Information Services and Technology, and the various record creators. The Archives cannot be expected to maintain the variety of computer systems necessary to view every kind of electronic record in its custody. Therefore, in cases where it does not possess the proper computing system, the Archives would direct individual researchers to University units with the appropriate hardware and software to view the record.

While the Archives will have ultimate custodial responsibility over the records, the records themselves would be physically stored by Information Services and Technology as this department already has the specialized storage space required to keep magnetic material. Information Services and Technology already does a fair amount of short term "archiving" -- or storage of records for emergency backup purposes. It is on this system that a more formal long term archives may be established. Recopying will be undertaken before media degradation by the Archives. As the lifespan of recording media is in almost all instances longer than the lifespan of computing system software, most copying

would be automatically undertaken by record creators when they migrate records to new hardware and software formats.

At a time of limited resources the implementation of an electronic records strategy needs to be as cost effective as possible. The shared responsibility of the Archives, record creators, and Information Services and Technology allows for the sharing of existing structures and staff to meet this end. Nevertheless additional resources will need to be obtained by the Archives. Such resources may include:

- access to an environmentally secure storage area sufficient to meet the volume needs for archiving electronic records;
- current hardware and software, including major operating systems and application software used by University departments;
- access to hardware and software for reading and copying data tapes and other recording media, and
- technical support.

The emergence of the computer has had a profound impact on the operation of modern society and institutions. Given the accelerating volume of records that are being generated, in the relatively near future the greater part of the archive of our society will consist of electronic documents. This eventuality has caused numerous archival theorists to argue for a rethinking of archival theory and the role of archives in our society. Is this necessary? The tools that archivists have devised throughout the years, such as provenance, contextualism, and the evidential importance of the record are more important now than ever. Traditional archival theory, with minor modifications to take into consideration the physical characteristics of electronic media, may be as effective for the electronic record as it has proven for the paper record.

Confidence in this fact will lead archivists to successfully apply their expertise to electronic records and thus to play a critical role in the evolving information and knowledge handling processes that have become central to our modern society.

**Endnotes**

1 University of Manitoba Department of Archives and Special Collections, *The Retention and Disposal of University Records: Policy, Guidelines, and Services*. p. 1

2 Mark Vajcner, *Proposed Electronic Records Management Procedure for the University of Manitoba Libraries* (August 1995).

**Appendix I**

**Proposed Electronic Records Management Procedure for the  
University of Manitoba Libraries**

Report Submitted to the Director of Libraries

August 1995

Prepared by Mark Vajcner,  
Department of Archives and Special Collections

## INTRODUCTION

The use of computer technology has become an integral part of the operation and administration of the modern office. Unlike paper based documents, where policies and procedures exist for the creation, organization, use, and disposition of material, no formal guidelines exist for the management of electronic records.

As electronic information makes up an increasing portion of the information holdings of many organizations, procedures for the effective and efficient administration of electronic records need to be developed.

In an effort to develop these policies and procedures the Department of Archives and Special Collections has undertaken a study in connection with the Libraries Administration Office. The guidelines which follow have been developed from this process and are recommended as an initial step toward the efficient and effective management of electronic records.

## FINDINGS OF THE STUDY

From May 31 to June 22 several interviews were conducted within the Libraries Administration Office. The purpose of these interviews was to provide a general knowledge of the creation, use, and storage of both paper and electronic records within the office.

Several trends and concerns regarding the management of electronic records emerged during this process.

### Trends

1. Many electronic records, particularly those generated with WordPerfect are working copies from which paper versions are eventually produced. These working copies are maintained for the production of revised documents while the paper printout is usually consulted in day to day operations.

2. The use of electronic mail is increasing. Most messages tend to be short consisting of two or three lines of text. Messages which contain information that may be needed at a later date are usually printed and filed with other paper correspondence.

3. The University is beginning to introduce electronic documents to conduct certain routine administrative transactions. These documents exist in the electronic form only.

## Concerns

1. That the continued storage of electronic records in personal directories may produce barriers to access by other members of the staff or result in the erasing or misfiling of records. A similar concern exists for electronic mail where the subject is work related.

2. There is also concern with the naming of computer files. The lack of a standardized system for naming files may cause difficulty in retrieval at a later date.

## Survey Results

The distribution of a questionnaire was also part of the study. This questionnaire solicited responses on a number of issues associated with a possible electronic filing system. The replies helped to determine the structure of the procedure that is now being recommended.

No objection was expressed by any respondents to the placing of important electronic mail messages into a centralized filing system. Respondents also reacted favorably to the regular retention and deletion of electronic documents. Concern was expressed, however, that the rapid change of technology could complicate this process.

Finally respondents indicated that the four principal tasks that an electronic filing system should perform were:

- provide quick and easy access to electronic records;
- maintain security;
- serve as evidence of actions;
- provide knowledge of who created the record and when.

## **RECOMMENDATIONS**

### Directory Management

It is recommended that the Libraries Administration Office establish a shared directory intended to serve as a central filing system for electronic files deemed important to office administration. This directory would be divided into several sub-directories, each reflecting the different functions performed within the office.



For example, sub-directories could be established for the human resource, finance and planning, or public service functions of the office. These sub-directories can then be further broken down by subject. For example, the human resource sub-directory could be divided into sub sub-directories for:

UMFA (University of Manitoba Faculty Association)  
 Job Descriptions  
 Health and Safety Committee  
 etc...

It is within these sub sub-directories that individual computer files would be stored.

### File Naming Conventions

It is recommended that the Libraries Administration Office develop naming conventions to aid in the identification of these computer files. The names chosen should reflect as closely as possible the existing subject classification system used for paper documents. This will ensure consistency between paper and electronic records.

File extensions, the three character suffix added to computer file names, are useful in further identifying a record. It is recommended that the Libraries Administration Office use extensions to identify the type of record. The following is a list of some suggested extensions:

Agenda	.AGD	Meeting Notes	.MTG
Briefing Note	.BRF	Notes	.NOT
Contract	.CON	Plan	.PLN
Draft	.DFT	Presentation	.PRE
Form	.FOR	Press Release	.PRS
Index	.IND	Project	.PRO
Letter	.LTR	Report	.REP
List	.LST	Schedule	.SCH
Memorandum	.MEM	Summary	.SUM
Minutes	.MIN	Supplement	.SUP
Miscellaneous	.MIS		

It is vitally important that the extensions used be standardized so that all office staff will be able to quickly identify the subject and type of document.

### Information About the Record

Information about the document itself is also required for the record to serve its proper role. The hallmark of a good recordkeeping system is that it

does not simply provide information but links the information to the transactions documented. The records may then be consulted for information or for a completely other purpose because the recordkeeping system captures, maintains, and accesses evidence of transactions over time as required to meet the administrative, legal, financial, and historical needs of the creating institution.

Archival theory maintains that to fulfill these tasks records must exhibit several characteristics. These characteristics are usually present in paper based documentation but this is less true of records in the electronic form. To meet the requirements of proper recordkeeping, electronic records should contain:

- the title of the file;
- its location in the directory and sub-directory;
- the date of creation; and
- information about who created the file.

Title and date information is recorded by the operating system and displayed when a directory is called up to the screen. The date information, however, changes each time that the record is modified therefore it is a good idea to include all data concerning the origin and creation of the record somewhere within the text of the document.

With a letter, for example, date and author information is included in the form of the letter. The title and location of the file could then be added at the bottom of the letter as follows:

s:\hr\umfa\example.ltr

Adding the above line would indicate that the letter entitled "example" is found in the University of Manitoba Faculty Association sub sub-directory of the human resources sub-directory. The letter would therefore meet all the requirements listed above.

### Retention and Disposal

Active records, or records referred to regularly by office staff in the conduct of their business, would be maintained on the shared directory. Those records that are used infrequently but remain important for administrative, legal, or fiscal purposes may be stored off-line on diskettes. The management of information on diskettes, however, should follow the same principles used for information on the shared directory.

Each diskette, or series of diskettes, could contain the documents under one sub-directory. A printout of the document index could be stored with each

diskette for retrieval purposes as is current practice. If necessary copies of these printouts could be collected in a binder for quick reference.

Access to the shared directory would be given to all office staff. If storage of confidential or sensitive files is required restricted hierarchical access could, theoretically be established by the LAN administrator. Diskette storage is also relatively secure as confidential material may be stored in a vault. Given the nature of documents maintained on the computer network at present, the establishment of restricted access does not appear to be a priority.

Once electronic records are no longer required for the functioning of the office retention and disposal may be undertaken. In the area of paper records the Department of Archives and Special Collections requires the "permanent retention" of records that

- are essential to the conduct of the business of the office;
- reflect the history of the office's development;
- reflect the history of the University and the role of the office in that history;
- provide testimonial or legal evidence of actions taken or not taken;
- establish fiscal responsibility and document revenues and expenditures;
- support administrative policies, programs and proposals; and
- record confidential, privileged or personal information.

Records that are a duplication of a record maintained elsewhere are also discardable. The survey of electronic records conducted earlier this summer indicated that many of the electronic records produced in the Libraries Administration Office are printed out sometime during their life cycle. It is therefore recommended that the paper version be maintained for transfer to the Archives in the normal way. The electronic version may then be destroyed.

The contents of the shared directory and diskettes should be reviewed on a regular basis to allow for the retention of active information and the deletion of records no longer required. Regular deletion of inactive and non-archival information is a good practice and should be undertaken semi-annually. Active information is easier to identify without sorting through numerous outdated files to locate the required document.

### Electronic Mail

Electronic Mail (E-mail) is particularly well suited to the communication needs of administrative decision and policy making. As the medium becomes more and more accepted by administrators the value of records generated and

communicated via E-mail will no doubt increase. As such, the preservation of E-mail to meet legal, fiscal, and historical requirements of the University will be an issue that needs to be dealt with.

At present, electronic mail is very amenable to preservation in paper form. Printing simplifies filing and classification as the paper filing system is already well established. An added benefit is that records on any transaction will remain together rather than being split along media lines.

#### Metadata Components and Filing Procedure for E-mail

As with computer files, information about the record (the metadata) is vital if E-mail records are to serve as a record of action. E-mail messages should contain information on:

- the originator;
- the date and time the message was sent or received;
- the recipient; and
- multiple recipients (e.g.: the "cc" line).

This material is usually included in the "header" at the top of the message. Once printed and filed, this is an indication that the message was received. An additional recognition of receipt would be to have the message initialed or stamped as would be done with conventional correspondence. This provides further evidence of receipt.

In order for such a system to be effective, however, the collection of information must be complete. For example, in a back and forth exchange of E-mail between two individuals on an important issue, all the messages need to be printed and filed in order to provide a proper record of the discussions and any actions taken.

#### Future Directions

The establishment of an effective electronic records management process represents the first step in the development of a response to the challenges posed by the electronic document. Given the ephemeral nature of electronic documents an effective records management policy is essential. Such a policy will not only provide for the more efficient use of electronic documents within an office, but will also provide archivists with a means of identifying records that require continuing preservation to meet the record retention responsibilities of the University.

As more and more administrative work is conducted via the computer, the office that understands the importance of what archivists call metadata, or the

information about the record and its origins, will have better command of its information resources. This is absolutely essential in a world of continually and rapidly changing technology where it is easy to lose sight of the fundamental characteristics of records and recordkeeping.

The guidelines presented in this report are thus intended to reaffirm these fundamental characteristics for electronic records and provide a practical and simple method for basic electronic records management.

## **BIBLIOGRAPHY**

Cox, Richard. "The Record: Is It Evolving?" in *The Records and Retrieval Report* 10 (March 1994).

*Managing Your Computer Directories and Files*. Ottawa: Minister of Supply and Services. 1993.

O'Brien, Jeff. "Electronic Mail In a Records Management Environment" (Unpublished paper. 1995).

*Retention and Disposal of University Records: Policy, Guidelines and Services*. Department of Archives and Special Collections.

## **Appendix II**

### **The Department of Archives and Special Collections**

#### **Retention and Disposal of University Records: Policy, Guidelines and Services**

"The record of the development of this great teaching institution from modest beginnings, closely paralleling and in certain important respects reflecting the development of the province itself, is a fascinating story."

Victor Sifton  
Chancellor,  
University of Manitoba  
1952-1959

#### **What are University Records?**

University records are defined as any records or documenting material, regardless of physical form or content, made or received by any officer, authority or department of the University that relate to the University and its business.

#### **Control of University Records**

University records are the property of the University. Responsibility for their retention and disposition rests with the Board of Governors. Staff members leaving the University must leave all University records for their successors.

#### **Permanent University Records**

Those University documents deemed worthy of permanent retention are those which:

- are essential to the conduct of the business of the office;
- reflect the history of the office's development;
- reflect the history of the University and the role of the office in that history;
- provide testimonial or legal evidence of actions taken or not taken;
- establish fiscal responsibility and document revenues and expenditures;
- support administrative policies, programs and proposals;
- record confidential, privileged or personal information.

Permanent University records may include:

- acts, by-laws, policies and procedures and other foundation documents that regulate or govern the administration of the creating office;
- correspondence or memoranda which record or provide information on policies, operations, inter-organizational activities and relationships, or which review the actions of committees, councils, departments or boards;
- minutes and agendas of meetings of boards, councils, faculties, departments and committees native to the creating office;
- reports, studies, plans, projections, proposals, and accreditations;
- personal files including faculty appointments and career files;
- selected photographic and audio-visual records as well as electronic records which, if in hard copy form, would be deemed to have permanent value;
- printed and published documents that relate to the University's functions, such as calendars, annual reports, newsletters, and yearbooks.

### **Discardable University Records**

Those University documents deemed discardable are those that:

- may be a duplication of an official copy maintained permanently elsewhere;
- may be a document without any enduring value (form letters, telephone message slips, invitations, etc.);
- may be a general file bearing no direct relationship to the University (circulars, catalogues, conference programs, etc.).

Discardable University records may include:

- copies of minutes and working papers of other boards, councils, faculties, departments and committees distributed throughout the University;
- routine correspondence and memoranda consisting of announcements, invitations, thank yous and acknowledgments, circulars, etc.;
- copies of financial statements, receipts, purchasing department records, budget working papers and memoranda, and any other financial records which are eventually consolidated into a year-end statement or which are held by the University's central financial department;
- copies of annual or routine reports received from other offices, departments, institutions, or organizations;
- printed and published documents unrelated to the University and its functions.

### **What is Records Management?**

Records management involves the surveying of existing records and the classifying of them according to the value they have to the creating office. The value of the records to the creating office is initially determined on the basis of whether the records are:

- **Active:** referred to or used regularly by an office in the conduct of its business;
- **Semi-Active:** referred to or used irregularly by the office, but remaining important for administrative, legal or fiscal purposes;
- **Inactive:** no longer required by the office for administrative, legal, or fiscal purposes.

Once the activity of the records has been determined the Archives recommends retention and disposal schedules for each series. The schedules recommend if and when the records should be transferred to the Archives.

Records management is an approach to the establishment of systematic controls over the creation, accumulation, use, maintenance, and disposition of recorded information. A records management program assists an organization to ensure:

- the retention of records required to meet administrative and operation requirements;



- the retention of records required to meet legal and fiscal obligations;
- the permanent retention of records of archival and historical value;
- the security of essential and vital records;
- the regular, authorized destruction of routine and obsolete records;
- the improved flow of information throughout the organization.

The objective of records management is to ensure an organization creates, accumulates, and maintains fewer records, better records, and effective records.

### **The University Archives**

The Department of Archives and Special Collections is a separate unit within the University of Manitoba Libraries and is located on the third floor of the Elizabeth Dafoe Library. Established in 1978, the Department has as its mission to acquire, catalogue, and preserve the special research collections which further the educational aims of the University of Manitoba and to promote and provide wide access to them. The Department has been given the mandate for managing the Archives of the University with its attendant acquisition, preservation, and records management functions. As stated in the Board of Governors By-law 7.00, Section 4.03:

"The University Archivist shall manage the Archives, and in so doing and without limitation shall appraise, collect, preserve, describe, and make accessible non-current but important and historically valuable University documents."

### **University Archives Holdings**

The Department's holdings of official University records has reached impressive dimensions. Now over 500 metres, the University Archives holds a number of major collections only a few of which are listed below:

#### Governance

Board of Governors minutes, 1917-1989

Senate, 1936-1992

University Council, 1877-1936

**Administrative Offices and Support Services**

President, 1904-1985

Vice-Presidents, 1934-1987

Registrar, 1900-1950

**Faculties and Departments**

Faculty of Agriculture, 1904-1985

Faculty of Arts, Dean's Office, 1960-1979

Continuing Education Division, 1925-1991

**Research Centres and Institutes**

Centre for Settlement Studies, 1966-1977

Centre for Transportation Studies, 1966-1985

**Other University-Related Organizations**

Alumni Association, 1920-1978

University of Manitoba Students' Union, 1960-1983

**University Archives Services**

The Department provides a wide range of services as part of its ongoing effort to acquire and preserve the historically valuable records of the University of Manitoba. These services include:

- records surveying and analysis;
- records scheduling;
- records retrieval;
- reference services and access to University records;
- archival processing and preservation of transferred material;
- advice on filing classification systems;
- microfilming or microfiching of University records;
- information on University history;
- orientation and training of staff regarding records management procedures;
- photocopy and photographic reproduction services.

## Bibliography

### Primary Sources

#### Interviews with University of Manitoba, Computer Services Staff

Gerry Miller, Director of Computer Services. January 9, 1995.  
Jim Jannetta, Associate Head of Computer Services. February 7, 1995.  
Don Busch and Barbara Chappell, Student Affairs. March 13, 1995.  
Dan Hiebert, Head of Database Technologies. March 21, 1995.

#### Reports and Policy Documents

National Archives of Canada. *The IMOSA Project: Functional Requirements for a Corporate Information Management Application*. 1992.

\_\_\_\_\_. *Managing Shared Directories and Files: Exposure Draft*. 1995.

Society of American Archivists. *Position Statement on Archival Issues Raised by Information Stored in Electronic Form*. 1995.

University of Alberta. *Document Retention and Disposal Policy*. 1974.

University of Alberta Computing and Network Services. *Computing Technology Directions and Initiatives on Campus*. 1993.

University of Florida. *E-Mail@UF: Privacy and Public Record*. 1994.

University of Manitoba. *Retention and Disposal of University Records: Policy, Guidelines, and Services*.

University of Manitoba Computer Services. *Annual Report on Academic Computing, 1993-94*.

University of Manitoba Computer Services. *Annual Report on Administrative Computing, 1993-94*.

University of Manitoba Computer Services. *Organization Chart, December 1994*.

University of Missouri. *Electronic Records at the University. Draft*. October 1991.

Vajcner, Mark. *Proposed Electronic Records Management Procedure for the University of Manitoba Libraries*. 1995.

## Secondary Sources

Acland, Glenda. "Archivist -- Keeper, Undertaker, or Auditor" in *Archives and Manuscripts*, 19 (May 1991).

Bearman, David. (ed). *Archival Management of Electronic Records*. Pittsburgh: Archives and Museum Informatics. 1991.

\_\_\_\_\_. *Archival Methods*. Pittsburgh: Archives and Museum Informatics, 1989.

\_\_\_\_\_. "Diplomatics, Weberian Bureaucracy, and the Management of Electronic Records in Europe and America" in *The American Archivist* 55 (Winter 1992).

\_\_\_\_\_. *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations*. Pittsburgh: Archives and Museum Informatics, 1994.

Bearman, David and Richard Lytle. "The Power of the Principle of Provenance" in *Archivaria*, 21 (Winter 1985-86).

Bennett, Richard E. (ed). *A Guide to the Major Holdings of the Department of Archives and Special Collections*. Winnipeg: University of Manitoba. 1993.

Burckel, Nicholas. "Archivists Facing the Millennium: Preparing for an Unknown - - But Not Unknowable -- Future" in *SAA Archival Outlook* (January/February 1997).

Cook, Terry. "Archives in the Post-Modern World: The Interaction of Archival Theory and Practice Since the Dutch Manual of 1898" in *Proceedings of the 13th International Conference of Archives*. Beijing. 1996.

Cox, Richard. "The Record: Is It Evolving?" in *Records and Retrieval Report* 10 (March 1994).

Davidson, Jenni and Luisa Moscato. "Towards an Electronic Records Management Program: The University of Melbourne" in *Archives and Manuscripts* 22 (May 1994).

Dollar, Charles M. *Archival Theory and Information Technologies*. Macerata, Italy: University of Macerata. 1992.

Ferrara, Ray and Philip A. Naecker. "The Data Warehouse: A Giant Step Forward" in *DEC Professional* (December 1993).

Freeman, Elsie T. "In the Eye of the Beholder: Archives Administration from the User's Point of View" in *The American Archivist*. Vol. 47, No. 2 (Spring 1984).

Hedstrom, Margaret (ed). *Electronic Records Management Program Strategies*. Pittsburgh: Archives and Museum Informatics, 1993.

Higgs, Edward. "From Medieval Erudition to Information Management: The Evolution of the Archival Profession". *Proceedings of the 13th International Conference of Archives*. Beijing. 1996.

Hurley, Chris. "What, If Anything is a Function?" in *Archives and Manuscripts* 21 (November 1993).

Lesk, Michael. "Going Digital" in *Scientific American* (March 1997).

Martin, Ann. *Report on the Status of the Electronic Records Program at the National Archives of Canada*. Ottawa: National Archives of Canada. 1996.

McDonald, John. *Information Management and Office Systems Advancement (IMOSA)*. Ottawa: National Archives of Canada. 1993.

Nesmith, Tom. (ed). *Canadian Archival Studies and the Rediscovery of Provenance*. Metuchen, New Jersey: Scarecrow Press. 1993.

\_\_\_\_\_. "Rethinking the Archival Document: The Next Frontier in Computing?". Unpublished paper. 1996.

Posner, Ernst. "Max Lehmann and the Genesis of the Principle of Provenance" in Ken Munden (ed) *Archives and the Public Interest*. Washington D.C.: Public Affairs Press. 1967.

\_\_\_\_\_. "Some Aspects of Archival Development Since the French Revolution" in *The American Archivist*. Vol. 3, No. 3.

Powell, Sheila. *Elements of an Archival Electronic Records Program*. Ottawa: National Archives of Canada. 1995.

Rothenberg, Jeff. "Ensuring the Longevity of Digital Documents" in *Scientific American* (January 1995).

Ruthfield, Scott. "The Internet's History and Development" in *Crossroads* (September 1995).

Saffady, William. *Managing Electronic Records*. Prairie Village, KS: ARMA International, 1992.

Schellenberg, Theodore R. *The Management of Archives*. New York: Columbia University Press. 1965.

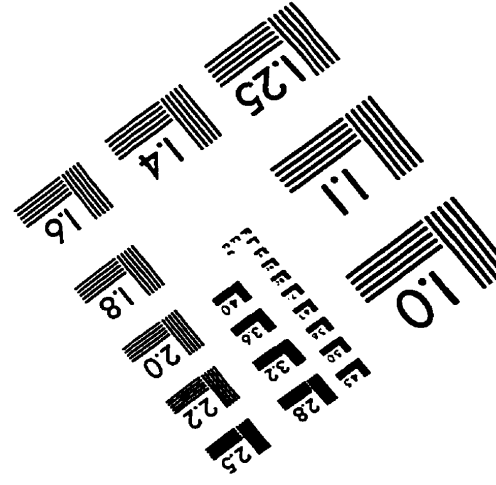
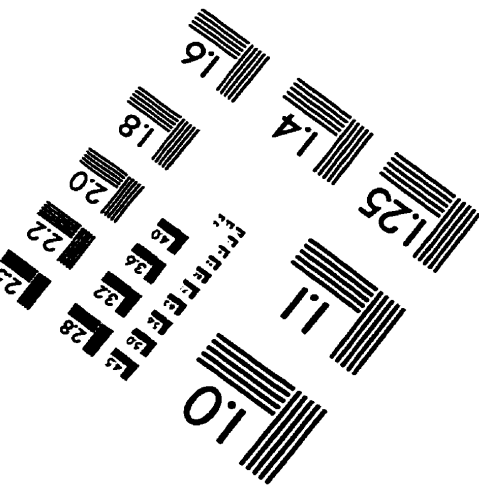
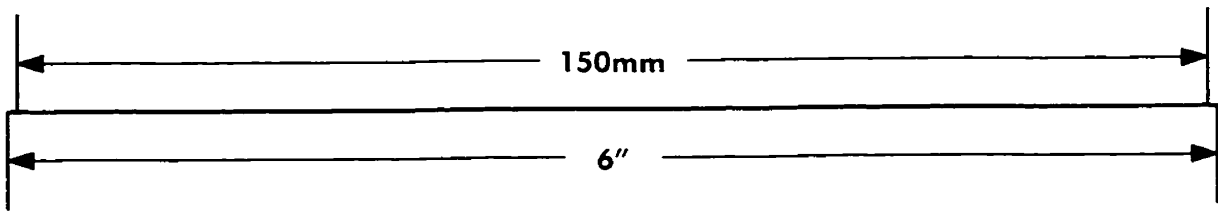
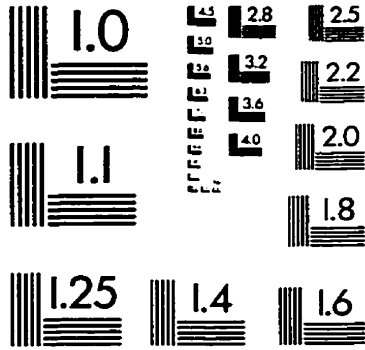
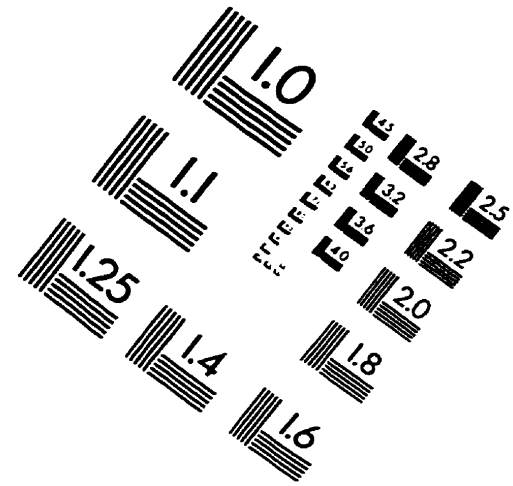
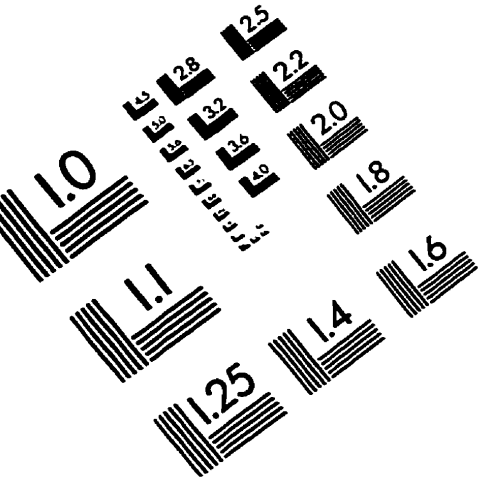
Schmandt-Besserat, Denise. "From Accounting to Written Language: The Role of Abstract Counting in the Invention of Writing" in B.A. Raforth and D.L. Rubin (eds). *The Social Construction of Written Communication*. Norwood, N.J.: Ablex Publishing. 1988.

Taylor. A.J.P. *Europe: Grandeur and Decline*. London: Penguin Books Ltd. 1967.

Thibodeau, Ken. "To Be or Not To Be: Archives for Electronic Records" in *Archives and Museum Informatics Technical Report 13* (1991).

Wallace, David A. "Metadata and the Archival Management of Electronic Records: A Review" in *Archivaria*, 36 (Autumn 1993).

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