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Contents

LETTER FROM THE EDITOR

This issue of *Archives and Museum Informatics: Cultural Heritage Informatics Quarterly* is unique among those we have published to date in not containing the usual news and reviews. It is, therefore, a "special issue" in every respect. Ever since I began publishing the journal (then Newsletter) I have hoped to find a way to "catch up" on the publication schedule under which the first issue of each volume appeared in May. Publishing this special issue at the end of 1994 finally provides me with a way of moving the publication schedule so that the first issue of 1995 will appear by the end of February. Volume 9, #1 will resume the usual mixture of articles, news and reviews.

Nineteen ninety-four was a banner year for electronic records management. Three of the major journals in the field of archives published a special issue on the subject during 1994 and several major conferences were devoted entirely to the subject. A smaller, but particularly valuable meeting sponsored by Archives & Museum Informatics is covered in depth in this issue. It was designed to identify areas of agreement and of continued dispute, and it made considerable progress towards greater consensus.

One reason that the year has been so productive is that the research project on electronic recordkeeping at the University of Pittsburgh has contributed a number of conceptual tools that have enabled others to measure the effectiveness of their electronic records effects. The "Functional Requirements for Electronic Recordkeeping" and the detailed specifications and formal production rules derived from them, serve as a framework for measuring programmatic interventions. These are reported on in this issue by Richard J. Cox.

While it may at first appear that electronic records are of interest only to archivists, and only to a small subset of archivists at that, in fact they are critical to all aspects of the preservation of our cultural heritage. We are rapidly becoming a society that employs electronic means to create and disseminate its culture.

ARTICLE

Re-Discovering the Archival Mission: The Recordkeeping Functional Requirements Project at the University of Pittsburgh, A Progress Report

Richard J. Cox

Abstract

What follows is a description and interpretation of progress and potential implications of a research project being carried out at the University of Pittsburgh School of Library and Information Science (1993-1996) and funded by the National Historical Publications and Records Commission. The official name of the project is "Variables in the Satisfaction of Archival Requirements for Electronic Records Management," NHPRC Grant No. 93-030. Co-principal investigators for the project are Richard J. Cox and James Williams, Pittsburgh SLIS faculty members; the Project Consultant is David Bearman. Doctoral students involved with the project have included Wendy Duff, Ingjerd Skogseid, David Thomas, and David Wallace.

The 1991 "Working Meeting on Research Issues in Electronic Records" and its report, Research Issues in Electronic Records, presented a major breakthrough in articulating the specifics of an electronic records research agenda. In response to this meeting and report, the University of Pittsburgh School of Library and Information Science received a $360,000 grant from the NHPRC in 1993 for a three-year project to examine how recordkeeping functional requirements can be used for administering electronic information systems including the maintenance of those records possessing archival value.

Introduction

Within the past five years, a new attitude has seemingly emerged when the archival profession speaks about managing electronic records.[1] There has been a definite shift, at least by the small corps of archivists working with electronic records, from viewing the technology as unresolvable dilemma, then to challenge, and, finally, to opportunity (as a better means for meeting

archival requirements). The University of Pittsburgh research project is *both* part of that transformation within the archival profession to understand the potential of the electronic recordkeeping technology *and* an indication of the re-discovery of the fundamental mission of the archival profession to maintain evidence.

Through the 1970s, archivists, primarily at the National Archives, developed methodologies for appraising, preserving, and making accessible large statistical databases and other records and information systems utilizing such technology. Through the 1980s-- with the advent of the mini and personal computer, declining costs for more storage, and more sophisticated and user-friendly software--archivists' attention was diverted to concerns about the impact of electronic records on the archival mission and archival principles. However, despite the magnitude and the long-term nature of the concern, archivists devoted little attention to basic research (searching for answers and better methods) about electronic records.

Prior to 1990, the only consensus within the archival profession about management of electronic records seemed to be the profession's consideration of the technical requirements needed for maintaining certain routine data bases; even as the best statements on the techniques needed for performing such a responsibility appeared in the mid-1980s, authors Margaret Hedstrom and Harold Naugler cautioned their readers that such files represented the most basic technology and that the uses of the technology for recordkeeping and information systems were rapidly changing.[2]

All around this earlier consensus, however, flowed debate about *how* and *whether* archivists could cope with electronic records. Archivists debated the relevance of archival principles, whether electronic records could be effectively accessioned into and held by archival repositories, and the role of traditional paper and eye-readable recording formats in the information age and, hence, the role of archival programs in this age. For a generation, however, the debate and anxiety--along with the lack of an appropriate archival infrastructure of education and research/development units--weakened archivists' ability to conduct research about or to try new methods to cope with electronic records issues which would provide answers to how archivists could contend with the technology.[3] Despite the fact that earlier government archivists like Margaret Cross Norton in the 1920s through the 1950s and Samuel S. Silsby, Jr., in the 1970s and 1980s had held a view of archival work that encompassed the management of records and a perspective on recordkeeping functions and activities (rather than an over-emphasis on the cultural role of archives), it took another generation to start a return to such a view.[4] In some ways, the debates and discussions masked archivists' own lack of relevant experience in managing the rapidly changing nature of electronic recordkeeping and information technology employed by organizations.

About five years ago, the primary evidence of shifting attitudes by those archivists working with electronic records appeared, and the transformation represented by these changes also illustrated the birth pangs of the research project currently being conducted at the University of Pittsburgh. A number of benchmarks reflect the possible recent paradigm shift in our profession. An advanced institute held from 1989 through 1994 for government (mostly state) archivists and records administrators at the University of Pittsburgh provided one opportunity for hearings about the challenges of and approaches to handling electronic recordkeeping systems that included records with archival value; this institute helped to show how far from real resolution of electronic records issues were the earlier and fairly traditional methods of managing electronic records.[5] The need to experiment with new approaches, quite different from scheduling or centrally storing the records in a repository, led to efforts by programs like the National Archives of Canada and its Information Management and Office Systems Advancement (IMOSA). The functional requirements developed with IMOSA focused on filing, retrieving and searching, editing corporate documents, records management, and document classification; the newness of this effort was the attempt to build systems which offices could utilize (a decided effort to jettison archivists working at the end of the life-cycle of records and recordkeeping systems) to ensure that archival records in electronic form were maintainable in a meaningful way.[6] The newsletter and technical reports published by David Bearman (starting in 1987), including many of his writings, also served as a conduit for news about such efforts from around the world, and these publications played an extremely important role in building a commonality of purpose for the need for such endeavors, including improvements in education and in research.[7]

The two most important elements of evidence regarding changing perspectives about and methods for managing electronic records were renewed interests in *education* to prepare archivists for working with electronic records and in *research* about new means to administer such records with an assurance of the records' archival integrity. The Society of American Archivist's Committee on Automated Records and Techniques, long a leader in designing and offering workshops on electronic records for archivists, undertook a massive new effort to develop curriculum guidelines for graduate and continuing education in electronic records management and created a new definition of base knowledge needed by the archivist for working in such systems.[8] Starting from the premise that a good electronic records archivist must understand archival principles and methods, these curriculum guidelines also reflected both how far the profession had come in working with such records (they certainly reflected improved knowledge gained from experience) and how far it still had to go (no current graduate archival program had a sufficient foundation for educating electronic records archivists).[9]

The second most important indication of a shift was a research conference on electronic records management organizd by the Minnesota Historical Society (MHS) in 1991, with funds from the National Historical Publications and Records Commission. The conference came in response to a 1990 report issued by the Commission regarding concerns about electronic records and its priorities for future funding.[10] Forty-six individuals attended the conference to "identify issues, describe research opportunities, methodologies, and projects, and determine priorities for projects contributing to the better management of archival information in electronic form." The resulting report described ten priority areas constituting a research agenda for the archival management of electronic records and these priorities were the immediate impetus for the University of Pittsburgh project.[11] Given that this was the first major research agenda backed by a funding source, and that the agenda related to an important and troubling professional issue, its impact will probably be much greater than other similar agendas.[12]

The University of Pittsburgh and the Project

The NHPRC research agenda established priorities to "define the requirements of archival electronic records programs; explore the conceptual, economic, and technological constraints on the long-term retention of electronic records; and establish criteria against which to measure the effectiveness of policies, methods, and programs."[13] The report also stated some basic requirements for how these research projects should look, including being "multidisciplinary in conception and execution" and able to "produce usable models or have generalizable results."[14]

The University of Pittsburgh School of Library and Information Science responded to this call with a specific research application submitted to the NHPRC, which was subsequently funded for three years (beginning in February 1993) at a cost of $360,000. I will briefly discuss the School's interest in undertaking this research, then describe the nature of the project, and finally provide a progress report (with a description of some of its initial accomplishments) on the project. It should be noted at the outset that the project has a long way to travel in demonstrating the *practical* value of the recordkeeping functional requirements to organizations utilizing computer technology, so what I am describing here is, at best, a preliminary report to the profession which should not preclude other programs from conducting similar research. However, there is no question in my mind that the *conceptual* value of these requirements is quite high.

Given the School's major focus on both library and information sciences, with the more recent addition of archival science, it should not be surprising that the School would respond to any call for interdisciplinary research in any of the information professions. The experience in hosting the electronic records and information policy institute also involved a sizeable number of

both library and information science faculty, increasing interest in archives and government information policy. Moreover, the School has had a number of other educational and research interests, such as information technology standards, that make a focus on electronic records management and archival science natural areas of interest for faculty and students.[15]

The design of the research project funded by the NHPRC is straightforward and in direct response to the three priority areas identified by the 1991 research conference. An interdisciplinary team of library, information, and archival science experts has been assembled to study the following issues:

(1.) Recordkeeping functional requirements for electronic information systems.

(2.) Variables in organizations that affect the way in which both software and hardware are utilized and which may affect the degree to which archival functional requirements can be adopted.

(3.) Technical capabilities of organizational software products to satisfy archival requirements.

(4.) Other means, such as policy and standards, to satisfy archival functional requirements.

(5.) Effectiveness of technology and policy strategies to ensure that archival interests can be met.

The research team is studying these issues in several ways: analysis of various software products; in situ study of the use of software and information technology in four different organizational requirements; and review by archival and other information science experts. The major intended product is a set of research products that address the viability of recordkeeping functional requirements, now seen as a major venue for preserving electronic information with archival value,[16] that can be used by both archivists and records and information resource managers in their own institutions.

Like any research project, there are a number of hypotheses being tested. These hypotheses relate to the research design pictured in *Figure 1*. These hypotheses, regarding the utility of recordkeeping functional requirements and their effect by various tactics and a variety of variables, are as follows:

(1.) The functional requirements for the archival management of electronic records are the same as for traditional records, although many functional requirements will not be satisfied by traditional record systems.

(2.) It will be possible to satisfy each of these functional requirements following any or all of the four tactics, although many requirements will be more fully satisfied for electronic records than they could for paper records.

(3.) Different business applications will share different sets of archival functional requirements, and differing degrees of risk are associated with the non-satisfaction of these requirements in different business applications.

(4.) Different software applications will not dictate different recordkeeping functional requirements, but different packages within the applications categories will satisfy the recordkeeping functional requirements to different degrees.

(5.) Recordkeeping functional requirements will be the same for each business sector, and different sectors will not determine the choice of tactics as much as different corporate cultures.

(6.) The best way to satisfy functional requirements will depend heavily on an organization's corporate culture, but the technological capabilities of the archives and its agents will be less critical in satisfying archival requirements than will be the acceptance of archival responsibility by managers throughout an organization.

A methodology is being utilized in conducting research on recordkeeping functional requirements and electronic records management and to test the hypotheses described above. Figure 1 provides a representation of the methodology being employed. The *functional requirements* for recordkeeping have been defined. While these requirements presently represent the best current statement the profession possesses for archiving, it is intended through this project to refine the requirements statement; a definitive statement of such requirements will be one result of this project. The various *tactics* are those which have long been discussed by archivists in both traditional paper-based recording and electronic records systems. Each tactic, separately and in combination with the others, will be tested to determine its validity and relevance in the archival management of electronic records. Policy is the development of procedures governing the creation and use of recordkeeping systems. Design is the intervention of requirements, such as those for archival functions, into the maintenance of a recordkeeping system. Implementation is the practical utilization of the recordkeeping functional requirements in electronic recordkeeping systems. Standards constitute both existing and potential information technology and related standards which may support the recordkeeping functional requirements. The *variables* are those aspects of any organization which may affect the use and effectiveness of recordkeeping functional requirements, such as specific business practices, current utilization of software, the external and other requirements of a particular organizational type, and the corporate culture of an organization; all of these, and others, may affect the potential integration of recordkeeping functional requirements into a specific organization's recordkeeping practices.

There are other intended products of this project. A major portion of the funds has been set aside for doctoral student fellowships. It is hoped that not only will doctoral students contribute in meaningful ways to the research project, but that these students will develop long-term interests in research questions on archival issues. Moreover, it is hoped that this project will aid in the enhancement of the existing graduate program in archival science at the School, enhancing its ability to equip archives students with a working knowledge of electronic records. As mentioned earlier, few such programs have a focus on electronic information systems and policies and the University of Pittsburgh seems to be a likely candidate to join these ranks and to be able to offer more due to its size, resources, and current faculty interests. Finally, the project is seen as a vehicle for building a foundation for research in archival issues at the School, a major problem in the archival profession. With the exception of a short-term summer fellowship program offered at the University of Michigan Bentley Historical Library, the American archival profession does not have any structures or other incentives for supporting research; this has showed in the archival literature.[17] It is hoped that within the next few years that doctoral students in archival science will be increasingly attracted to the School and that the masters program in this field will be expanded to include a greater requirement for and focus in basic applied research areas.

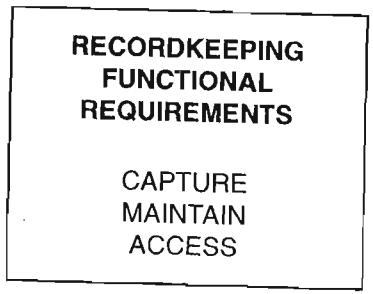
Progress of the Project

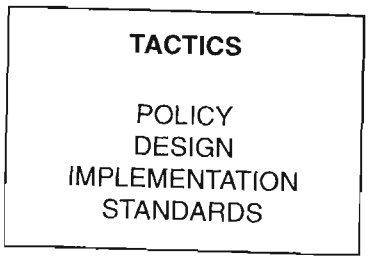
According to the original project narrative, a number of tasks were to have been completed by this stage of the project. What follows is a brief description of each of these tasks.

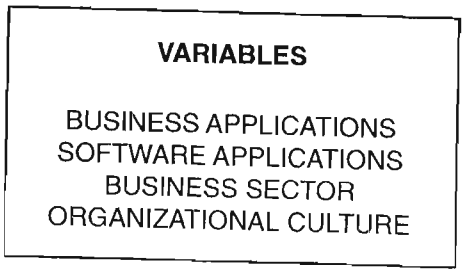
Organizational Test Sites. Organizational test sites were selected, mission statements and additional information about the sites were assembled, potential software and business applications were to have been selected for study, and various research work and analysis at the test sites begun. Work has begun at three of five organizations selected for this project. During the Fall 1993 we had a luncheon meeting with individuals representing specific test sites, and at this meeting we discussed the project and our needs for assistance from the sites. Out of this emerged five sites, including manufacturers, local government, a hospital, and a university. Preliminary visits by the research team were made at three of the five sites. Two of the sites have had organizational culture profiles completed. It is anticipated that all five of the organizations will have had their cultures profiled by early 1995, and we expect to have made presentations about the recordkeeping functional requirements at all five of the sites shortly thereafter.[18]

We have developed an additional set of hypotheses regarding organizational culture and the reaction of particular institutions to the recordkeeping functional requirements:

Figure 1
Research Methodology







* Informants within the five organizations being studied will have more similar views of their respective cultures than informants selected randomly.
* Specific values along each dimension will correspond with specific attitudes held by the informants towards the recordkeeping functional requirements.
* The rationales provided for selecting recordkeeping functional requirements and the tactics suggested for their use will correlate with the characterization that informants provided of the organizational culture.

If the above are confirmed, we would expect to be able to make the following conclusions:

* Particular dimensions of organizational culture may incline people to suggest particular attitudes towards the recordkeeping functional requirements.
* Specific testimony on organizational cultural variables is directly related to the explanations that the informants will give for the use of the recordkeeping functional requirements.
* A predetermination of the attitudes of informants about their organizational cultures can help in presenting the recordkeeping functional requirements and tactics.

Early in the project, some difficulties arose in developing or adapting appropriate mechanisms for acquiring profiles of the organizations we were studying, and the resolution of such problems is worth some discussion as well. David Bearman, in an earlier essay, hypothesized that there is a relationship between an organization's culture and two decisions that the organization makes about electronic recordkeeping. These two decisions are (1) the organization's determination that a recordkeeping requirement ought to be satisfied and (2) the organization's choice of tactics by which to meet the requirement.[19]

This study wishes to examine whether such a relationship might exist and, if so, if it can be used in a *pragmatic* way to help identify an approach that records managers and archivists can utilize in an organization involved in making decisions about electronic recordkeeping. Recognizing that resources would prevent a complete analysis of the organizational culture of the institutional test sites as a precondition for working on electronic recordkeeping functional requirements strategies, we are not attempting to characterize in any precise manner the cultures of the sites we are studying. Instead, we will focus on the perceptions held by the informants with whom we are working, and we will try only to determine if these perceptions can help guide us in proposing requirements and tactics. Any tentative con-

clusions we might make about the institutions' cultures and the manner in which they respond to the recordkeeping functional requirements will be used to suggest the need for other more systematic research in organizational cultures and electronic recordkeeping.

The methodology we are using relies on the use of semi-structured interviews. We conduct an interview with each informant in which we categorize their perception of the institution's culture, using a set of dimensions examined in other studies of organizational culture and described in a background paper prepared by David Wallace.[20] On a subsequent occasion these same informants will be presented with functional requirements for recordkeeping systems. During this second session, the explanations they provide for why the recordkeeping requirement must or need not be satisfied and what tactics the informants would select to implement those which should be met will be categorized (using the same dimensions) in order to determine what these tactics suggest about the organizational culture.

In each interview situation, two researchers are present. One engages the informant in the unstructured interview and one independently records their impressions of the responses using a pre-defined scale. Based on notes taken during the session, the two then establish a working profile of each informant's responses. A summary of each interview is reviewed by its interviewee in order to confirm its accuracy. The responses from the second interview session about the recordkeeping functional requirements are compared with the general profile on organizational culture obtained from the first interview.

To facilitate this form of data-gathering in the institutions, the following steps are being followed:

Orientation Meeting. This meeting is held at the institution to review the purpose of the project, inform the test sites of what we will be doing, and ask for certain information (such as organizational chart and mission statement). Prior to the meeting we discuss the purposes with our contact person and ask for them to identify other individuals who should be present at this meeting.[21] It lasts about one to one-and-a-half hours. We also endeavor to meet privately with the contact person in order to identify other information which would be useful for us to have, to discuss any perceived problems, and to answer any other questions.

Organizational Culture Interviews. These meetings with individuals seek to develop a profile of their perceptions of the organizational culture. Each interview lasts approximately one hour to one-and-a-quarter hours.

Recordkeeping Functional Requirements Meeting. After the completion of the organizational culture interviews, a general meeting will be held to discuss the recordkeeping functional requirements (to date, none of these have been held as part of the research project). Copies of the functional requirements will be provided. This meeting is anticipated to take about two hours.

Recordkeeping Functional Requirements Interviews. About one month after the general meeting on this topic, the same interview team will return to the institutional test sites and present the recordkeeping functional requirements for discussion to the individuals who discussed organizational culture. During these interviews, general reactions to the functional requirements as well as tactics for their implementation will be considered. These interviews will last about one hour.

Group Review of Tactics and Implementation. Based on the second group of individual interviews, a set of tactics for the implementation of the recordkeeping functional requirements will be compiled. At this general meeting at each test site, there will be a presentation of the tactics for general discussion.

Final Paper. A paper will be written summarizing the notion of organizational culture and its impact on the use of the recordkeeping functional requirements. This paper will serve as one of the primary research products of the project.

Recordkeeping Functional Requirements. The original research design called for a literature review, the preparation of a draft statement of requirements, and the beginnings of the application of these requirements at test sites by the end of the first year. The advisory group met in May 1993. A draft of the functional requirements was prepared and mailed to over one hundred archivists, records managers, and other information professionals, and their comments were considered in a revision.[22] This draft was utilized in the preparation of several publications by project members and work on refining the requirements continued. The draft of the recordkeeping functional requirements has been widely distributed in North America, Europe, and Australia, and they have been favorably discussed by many archivists and records managers. David Bearman's offering of an intensive two-week workshop at Edith Cowan University in Perth, Australia, in June 1993 and the sponsorship of a three-day working meeting on electronic records with an international cast by Archives and Museum Informatics in April 1994 in Pittsburgh, in addition to mailings from the project, have served this wide distribution and discussion. In the November 1993 issue of the Australian records management quarterly, *Informaa*, for example, there is a brief discussion of the recordkeeping functional requirements (including their reproduction) and the concepts supporting them.[23] Sue McKemmish, also of Australia, has provided another description of the functional requirements as presented in the June 1993 Bearman workshop.[24] These requirements have been drawn upon for some publications by Bearman and Cox, enabling the wider dissemination of the requirements for discussion in the profession.[25] The Project Team also discussed and prepared a response to the proposed draft of specifications for the Government Information

Locator System (GILS), using the functional requirements as a means of expanding the bibliographic elements to encompass not just government publications and databases but electronic information recordkeeping systems as well. Ken Sochats of the Department of Library Science has developed a first complete set of production rules (a heuristic) for the draft functional requirements.[26]

One of the difficulties encountered in surveying the existing archival literature for statements about recordkeeping functional requirements is that most of the related literature has been focused on requirements for archival management systems. But there are some substantial differences between these two different categories of requirements. Recordkeeping functional requirements, the topic of this research study, are elements guaranteeing that the integrity or substance of an archival record can be maintained. The current glossary of the Society of American Archivists states that a record is a "document created or received and maintained by an agency, organization, or individual in pursuance of legal obligations or in the transaction of business."[27] An archival record is a record "preserved because of [its] continuing value."[28] These definitions are not nearly specific enough. Requirements for archival management systems are generally to assist archivists in managing their basic activities such as appraisal, acquisition, preservation, reference and access, and arrangement and description. As David Bearman has noted, "we find that the functional requirements of archival and museum collections management systems reflect the (common) activities of managing collections, not the (unique) characteristics of the items in their care."[29]

In drafting the recordkeeping functional requirements we have defined archival records as evidence of transactions. It could be considered that this is one way by which we have limited our research design, an important limitation given that archivists have developed effective ways of handling statistical and related data sets created for and maintained solely for informational purposes. Our Australian colleagues have provided some of the most important statements on this matter. As Glenda Acland has noted, "the pivot of archival science is evidence not information. Archivists do not deal with isolated and free-floating bits of information, but with their documentary expression."[30] In this sense we have drafted recordkeeping functional requirements that seek to preserve within an organizational environment (the records creator) the sense of a record as an organizational transaction that preserves evidence of that transaction. We see *other* informational values as important but as secondary to this role.

Research Teams. Teams of faculty, the consultant, and the doctoral students were assembled to conduct research at the test sites and to do additional analysis about the recordkeeping functional requirements. A revision of the existing records management course was intended to assist the work of the teams. Four doctoral students were assembled for the project, the research teams identified, and the revised records management course

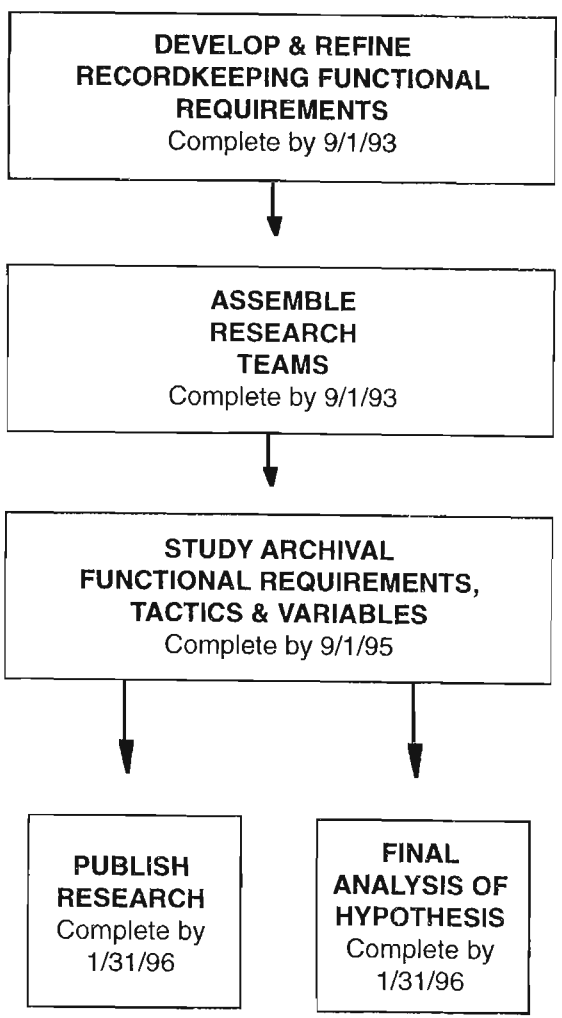
taught once in 1993 and another version was being offered in the Fall 1994 term. Shifts in the composition of the doctoral students has led to different expectations in the project timetable.

Assessment Tools for Working in Organizations. Much of the second phase of the project has been expended in the preparation of tools to be used in the test sites. Ideally, this work will lead to the development of instruments which can be readily used by other archivists and records managers to determine the nature of their organizations and the potential obstacles and supports they face in developing effective mechanisms for managing electronic records. We have the recordkeeping functional requirements, their production rules, a set of dimensions (information management, decisionmaking, management, career and employment issues, and human relations) and methodology (unobtrusive observation and semi-structured interviews) for developing a profile of the various institutional cultures. An effort, somewhat unsuccessful, was made to develop a similar methodology for developing an overall profile of organizational functions that archivists and records managers can use to target certain high-profile and essential ones.[31] While there was an array of methodologies for use in the corporate culture assessment, we have had to develop a more experimental methodology requiring more evaluation. We are also just now beginning to develop an assessment tool that will yield a profile of the information technology employed by a particular organization.

Discussion of the Research Project. We have been discussing the project and its intended products within the profession. In addition to disseminating reports and preparing some articles for publication, we have made every effort to create opportunities for discussion of the project at professional conferences including, presentations at the 1994 Society of American Archivists meeting. In April 1994, the four doctoral students and co-Principal Investigator Cox participated in a conference hosted by Archives & Museum Informatics in Pittsburgh of electronic records experts from around the world. This provided an opportunity for us to report on our project, to receive feedback from experts, and to learn from others approaches to the management of electronic records that might be useful to the project's remaining two years. In May 1994, Cox, Duff, and Wallace attended the Association of Canadian Archivists meeting in Ottawa which featured a core number of sessions on electronic records management. This provided us another opportunity to gather information about related work with such records and to share where we are in our project with relevant experts. In May and June 1994, Bearman conducted another week-long workshop in electronic records management in Australia, again affording us the opportunity to have some discussion of our project results to that point. This workshop was part of a project by the Edith Cowan University to develop distance education packages on archival science topics to be offered electronically via the Internet. Bearman has prepared a module on electronic records management which builds on the work of this project on recordkeeping functional requirements

Figure 2

Plan of Work



and which will serve as a very convenient means of disseminating information about it.

Accomplishments: Building Research Team Resources. During the course of the project, we have also gathered and organized reports, studies, articles, manuals, and other materials related to the management of electronic records. These files have been organized, abstracts entered on ProCite for easy retrieval, and a bibliography compiled from these by Cox for publication in Margaret Hedstrom, ed., *Electronic Records Management Program Strategies* (Pittsburgh: Archives & Museum Informatics, 1993).[32] The publications and other related materials being gathered by this project have proved to be a valuable resource for the doctoral students and other members of the project. They will be useful after the project is completed for students studying archival science or other topics in which the management of electronic records is a pertinent issue.

Electronic Records Course.The Records and Information Resources Management course, offered annually during the Fall term as part of the archival science specialization, was re-designed in 1993 to focus on electronic records management. Richard Cox taught the first six weeks, providing the students with a general orientation to records and information resources management, and remained the lead faculty for it. David Bearman taught four weeks, focusing on electronic records and the issues of their management and nature, and participated in all of the class sessions. Ken Sochats, one of the other Project Team members, provided a guest lecture on systems design and electronic records. Two of the Project Team doctoral students, David Wallace and David Thomas, also took the course, preparing papers on corporate culture and business functions respectively. The remaining students were required to prepare papers on the recordkeeping functional requirements developed for the project. Each student also made an oral presentation to the class on this paper topic. The enhancement of this course moves the School into a new phase of providing some form of archival education on electronic records issues and reflects a move other programs must also make.[33]

Other Products. Throughout the year there have been other spinoff products from the project, usually the result of specific members of the Project Team following up on their own interests. David Wallace, for example, prepared a thoughtful analysis of the concept of metadata requirements for archivists, recently published in *Archivaria*.[34] Richard Cox has been working on a paper describing how the concept of "archives" has been used across a variety of professional disciplines and their literatures, considering the matter of professional cultures as opposed to the corporate culture notions David Wallace has been using.[35] It is likely that the project will continue to stimulate other research and writing on archival topics by the various members of the project.

Conclusion

We have finally reached that point in the project where we will be evaluating specific aspects of the recordkeeping functional requirements at the test sites and in their relationship to certain software applications. Most of the products have been more conceptual in nature. From this point, and in the remaining reports of this project, we expect the results to be specific assessments of the recordkeeping functional requirements in the test sites. We will be developing heuristics which provide realistic tools for the archival, records management, and related information professions to use in the maintenance of records in electronic systems.

It is important to bear in mind that the research project described here and the work of the University of Pittsburgh's School of Library and Information Science has only just begun its work. It is unrealistic to expect that a profession that has not effectively dealt with the full-range of electronic records for three decades could resolve the problem overnight. The best long-term solution may be the education of beginning archivists in information science and policy and their commitment to ongoing research such as being undertaken by the project.

It is difficult at this stage to predict what the outcomes will be. The dearth of research on electronic records makes it difficult to see this research project as anything more than very preliminary. Unfortunately, there are already indications that some in the field are looking to this project as if its aim was to discover a "magic bullet" solution for archivists for working with electronic records. Those involved in the project see it as an opportunity to learn more about the relevance of record-keeping functional requirements for electronic information systems. It is a beginning of understanding what we must do to preserve the portion of our documentary heritage that is electronic.

However, there is something, in my estimation, already accomplished by this project. At the beginning of this paper, I noted that the University of Pittsburgh research project is *both* part of that transformation within the archival profession to understand the potential of the electronic recordkeeping technology *and* an indication of the re-discovery of the fundamental mission of the archival profession to maintain evidence. American archivists have operated, for far too long, as if their mission was only a cultural mission, when in fact the real mission should be to ensure that the essential evidence of organizations will be maintained, in whatever form is necessary -- including electronic. Considerable interest shown in this project and the recordkeeping requirements from archivists around the world suggest that we are, as a profession, experiencing a paradigm shift in our mission and approaches. The preservation of the evidence will provide more than is necessary for historians and others to conduct their research, and this focus on evidence -- which the recordkeeping functional requirements return us to -- is much more manageable *and* crucial to the archival mission.

Endnotes

(1.) I say "seemingly" because it seems as if this new attitude or consensus has emerged among a fairly distinct and small portion of the archival profession. There remains strong sentiment that old models of ways to manage electronic records -- accessioning them into the archives, refreshing the tapes, and providing copies of the tapes to researchers (the old social science data archives approach) -- is relevant for all electronic records, and, moreover, that paper records would remain the prevalent form of recordkeeping in institutions. Are we at the point of a real paradigm shift, such as described by Thomas Kuhn, that is, just how widely shared is this new paradigm and, just as important, can there be a real shift if it is isolated to a very small portion of the archival profession when the entire profession faces responsibility for electronic records? Refer to Thomas S. Kuhn, **The Structure of Scientific Revolutions**, 2nd ed., enlarged (Chicago: University of Chicago Press, 1970) and Paul Hoyningen-Huene, **Reconstructing Scientific Revolutions: Thomas S. Kuhn's Philosophy of Science** (Chicago: University of Chicago Press, 1993) for some thought-provoking reading on this kind of issue.

(2.) Hedstrom, **Archives & Manuscripts: Machine-Readable Records**, Basic Manual Series (Chicago: Society of American Archivists, 1984);Naugler, **The Archival Appraisal of Machine-Readable Records: A RAMP Study with Guidelines** (Paris: General Information Programme and UNISIST, UNESCO, 1984).

(3.) Terry Cook, "Easy To Byte, Harder To Chew: The Second Generation of Electronic Records Archives," *Archivaria* 33 (Winter 1991-92): 202-16 is an excellent, brief introduction to the shift in attitudes. Reviewing eight reports released in 1990-91, Cook argues that archivists have moved from a first generation - "when electronic records archivists turned to others using computerized records for advice and inspiration" - to a second generation of experienced and competent electronic records archivists developing their own solutions and programs. For the challenges faced by archivists before this shift, see my own **The First Generation of American Electronic Records Archivists: A Study in Professionalization** (New York: Haworth Press, 1994). This latter study considers the various efforts by American archivists to manage electronic records in the period 1960-1990, and it considers how the failure to develop a real, logical consensus was the result of a weak professional infrastructure. The profession's structural weaknesses include the following: a lack of rigor of educational entry requirements; the lack of comprehensiveness of continuing education; poor credentials for practice; low status and image, important for credibility for working with other information professionals and policymakers; and a low degree of research on relevant matters.

(4.) Thornton W. Mitchell, ed., **Norton on Archives: The Writings of Margaret Cross Norton on Archival & Records Management** (Carbondale: Southern Illinois University Press, 1975) and Samuel S. Silsby, Jr., **Public**

Administration of Integrated Public Records Programs, Informational Bulletin no. 9 (Augusta: Maine State Archives, 1981). In my own view, I believe this perspective was lost because of the weakness of archival education and the predominance of a historical-cultural perspective in the profession; I discussed these views in my "The Archival Profession and Information Technology Standards," *Journal of the American Society for Information Science* 43 (September 1992): 571-75. A historical orientation is important, but it is not important because it provides a subject knowledge; it should be important because history provides a broader perspective necessary for understanding the context of records and record-keeping systems and because it enables archivists to understand methods used by certain users of archives -- a very different perspective on the value of and role for history in archival science.

(5.) A chapter on the institute is included in my **First Generation**, although in this I am mainly considering the institute as a form of continuing education. Narrative descriptions of the institute were prepared by me and distributed as **Archival Administration in the Electronic Information Age: An Advanced Institute for Government Archivists** (Pittsburgh: School of Library and Information Science, University of Pittsburgh, August 15, 1989). Reports of the same title were published on the 1990 and 1991 Institutes.

(6.) See John McDonald, "Managing Information in an Office Systems Environment - The IMOSA Project," in **Information Handling in Offices and Archives**, ed. Angelika Menne-Haritz (New York: K. G. Saur, 1993), pp. 138-51. This project is different from the one being researched at the University of Pittsburgh; instead of trying to give a tool that can be used by administrators and others responsible for an organization's record-keeping, the Pittsburgh effort is intended to determine whether an organization's current software applications meet or can be easily made to meet a set of record-keeping functional requirements through a variety of technical and policy approaches. Either approach has merit, depending on the organization's corporate culture, and both approaches are infinitely better than the old method of appraising old recordkeeping systems long after their current usefulness has declined.

(7.) See, for example, David Bearman, ed. **Archival Management of Electronic Records**, Archives and Museum Informatics Technical Report no. 13 (Pittsburgh: Archives & Museum Informatics, 1991); Margaret Hedstrom, ed., **Electronic Records Program Management Strategies**, Archives and Museum Informatics Technical Report no. 18 (Pittsburgh: Archives & Museum Informatics, 1993); and David Bearman, **Electronic Evidence: Strategies for Managing Records in Contemporary Organizations** (Pittsburgh: Archives & Museum Informatics, 1994). Bearman has also published essays in the mainstream archival literature, most notably the *American Archivist*, *Archivaria*, and *Archives and Manuscripts* and recently collected in his **Electronic Evidence: Strategies for Managing Records in Contemporary Organizations** (Pittsburgh: Archives & Museum Informatics, 1994).

(8.) The final report and supporting papers were published in a special issue of the *American Archivist*, volume 56, Summer 1993.

(9.) In my own opinion, I have become increasingly convinced that the only effective means by which to educate electronic records archivists would be to have students first complete a comprehensive archival education program (comparable to the Masters in Archival Studies degree currently offered in several schools in Canada and recently endorsed in principle by the Society of American Archivists) and then take an additional year for study in electronic information technology, record-keeping, and information systems. This poses an extremely difficult question about the costs associated with such an educational program and whether the profession is willing to support such costs by offering sufficient positions with decent salaries in electronic records management.

(10.) National Historical Publications and Records Commission. **Electronic Records Issues: A Report to the Commission**, Commission Reports and Papers, no. 4 (Washington, D.C.: National Historical Publications and Records Commission, March 1990).

(11.) National Historical Publications and Records Commission. **Research Issues in Electronic Records** (St Paul, MN: Minnesota Historical Society for the National Historical Publications and Records Commission, 1991).

(12.) The American archival profession has produced a steady stream of research agendas since 1978, but the response to these has been, at best, a sporadic one. Many reasons are offered for this -- lack of time, too few academics, lack of stress on research in archival education, insufficient research skills -- but the lack of funding has certainly been a major reason for this. I have described the research agendas and actual research in my essay, "An Analysis of Archival Research, 1970-1992, and the Role and Function of the American Archivist," *American Archivist*, forthcoming.

(13.) **Research Issues**, p. 7. See also Margaret Hedstrom, "Understanding Electronic Incunabula: A Framework for Research on Electronic Records," *American Archivist* 54 (Summer 1991): 334-54.

(14.) **Research Issues**, p. 23.

(15.) See Michael B. Spring and Martin B. Weiss, "Education in Information Systems Standards," in **A Sourcebook of Standards Information: Education, Access and Development** (Boston: G. K. Hall and Co., 1991), pp. 53-72.

(16.) See, for example, David Bearman, "Diplomatics, Weberian Bureaucracy, and the Management of Electronic Records in Europe and America," *American Archivist* 55 (Winter 1992): 168-80.

(17.) In a paper I delivered at the Spring 1993 Midwest Archives Conference on archival research, I concluded that since 1970 the archival journals have published a average of less than four research articles a year. And the research methodologies have been limited mostly to historical essays and surveys, and the quality of these is also very uneven. A version of this paper is being published in a special forum of the *American Archivist* focused on archival research.

(18.) Progress on these aspects of the project was less than originally anticipated due to changes within the project staffing by doctoral students. Although we anticipate the need for a project extension, this extension will not been extensive and the project will be completed during 1996.

(19.) David Bearman, "Diplomatics, Weberian Bureaucracy, and the Management of Electronic Records in Europe and America."

(20.) "Satisfying Recordkeeping Functional Requirements: The Organizational Culture Variable," included in the "University of Pittsburgh Recordkeeping Requirements Project: Reports and Working Papers," **University of Pittsburgh School of Library and Information Science Research Reports**, LIS055/LS94001 (Pittsburgh: The School, September 1994). A copy of this report may be obtained by contacting Richard J. Cox, School of Library and Information Science, University of Pittsburgh, Pittsburgh, PA 15260 or rjc@icarus.lis.pitt.edu.

(21.) Generally, we have asked for the following individuals to be present: information technology systems designers; records manager and/or archivist; a senior management representative; an internal auditor; legal counsel; and any individuals responsible for what the organization considers to be critical, mission-based systems within the institution.

(22.) Written comments were received from half a dozen individuals, although we subsequently had verbal discussions from many others. Most of the written comments were extremely favorable, although the depth of critical analysis was not very significant. This is as was expected at this early point in the project. For some, the concepts represented were quite new and these individuals expressed an interest in further reflection and wanting to have additional progress reports on the projects. Sue McKemmish, writing on behalf of her Australian colleagues, noted that archivists in her country were working to determine the viability of the recordkeeping functional requirements while believing that what we had was an important start in re-evaluating and re-defining archival work. There were a few statements on very specific aspects of the functional requirements, one being that there had been "inadequate attention to ensuring authenticity through the primary functional requirements."

(23.) Laurie Varendorf, "Electronic Records Conference Shocks Audience," *Informaa*, November 1993, pp. 17-18.

(24.) "Understanding Electronic Recordkeeping Systems: Understanding Ourselves," *Archives and Manuscripts* 22 (May 1994): 150-162.

(25.) David Bearman provided a description of the earliest draft of the requirements in his "Record-Keeping Systems," *Archivaria* 36 (Autumn 1993): 16-36 and "Archival Data Management to Achieve Organizational Accountability for Electronic Records," *Archives and Manuscripts* 21, no. 1 (1993): 14-28. Bearman also used these requirements in his discussion about a landmark records court case in his "The Implications of Armstrong v. Executive of the President for the Archival Management of Electronic Records," *American Archivist* 56 (Fall 1993): 674-89 and a companion essay, "Managing Electronic Mail," *Archives and Manuscripts* 22, no. 1 (1994): 28-50, which, utilizing the recordkeeping functional requirements and the various organizational tactics of policy, design, implementation and standards being tested in the University of Pittsburgh research project, the author considers how electronic mail can be managed. These, and other related essays, have been included in David Bearman, **Electronic Evidence: Strategies for Managing Records in Contemporary Organizations** (Pittsburgh: Archives & Museum Informatics, 1994). Richard Cox, in his "The Record: Is It Evolving?" *Records & Retrieval Report* 10 (March 1994): 1-16, has provided another presentation of an early draft of the project's recordkeeping functional requirements, although his view described here is that the definition of the record as represented by the suite of functional requirements is, in fact, a rediscovery of older principles and concepts employed by archivists, records managers, and the creators of the records.

(26.) See David Bearman and Ken Sochats, "Formalizing Functional Requirements for Recordkeeping," in the **University of Pittsburgh Recordkeeping Functional Requirements Project: Reports and Working Papers**.

(27.) Lewis J. Bellardo and Lynn Lady Bellardo, comps., **A Glossary for Archivists, Manuscript Curators, and Records Managers** (Chicago: Society of American Archivists, 1992), p. 28.

(28.) Bellardo and Bellardo, **Glossary**, p. 3.

(29.) See, for example, David Bearman, **Automated Systems for Archives and Museums: Acquisition and Implementation Issues** (Pittsburgh: Archives & Museum Informatics, Winter 1987/88) and **Functional Requirements for Collections Management Systems** (Pittsburgh: Archives & Museum Informatics, Fall 1987), p. 1.

(30.) Glenda Acland, "Managing the Record Rather Than the Relic," *Archives and Manuscripts* 20, no. 1 (1992): 58.

(31.) David Thomas, "Business Functions: Toward a Methodology," in included in the **University of Pittsburgh Recordkeeping Requirements Project: Reports and Working Papers.**

(32.) "Readings in Archives and Electronic Records: Annotated Bibliography and Analysis of the Literature," in Margaret Hedstrom, ed., **Electronic Records Management Program Strategies** (Pittsburgh: Archives & Museum Informatics, 1993), pp. 99-156.

(33.) Archival science is a recent introduction to this school founded in 1962, and having the distinction of being the first school to include "information" and "library" in its name. The School's interest in archival science was, until more recently, fairly erratic (not unlike the patterns shown by many other such schools). It was not until the mid-1970s that the School offered its first archives course, offered irregularly and taught by an adjunct. A faculty retreat held in 1987 identified archives and records management as a potential area for new development in specialization and resulted in 1988 in the hiring of a faculty member to develop a curriculum in archival science. Since 1988 the curriculum has expanded significantly with records management and introductory library and archives preservation courses, an advanced course in archival appraisal and an advanced course in preservation management, and another advanced course in archival arrangement, description, and reference was added. In addition to these courses there are closely related courses, such as oral history and tradition, the history of books and printing, and critical bibliography. And there are, of course, numerous courses in information technology available to the archives student.

(34.) "Metadata and the Archival Management of Electronic Records," *Archivaria* 36 (Autumn 1993): 87-110.

(35.) This essay will be used in a collection of essays he is preparing for publication on the topic of archivists and their various "publics."

CONFERENCE

Working Meeting on Electronic Records

Wendy Duff, David Thomas, and David Wallace

On 8-10, April 1994, record managers and archivists from around the globe (see appendix) assembled in Pittsburgh, Pennsylvania, to share their experiences and ideas concerning the management of electronic records. David Bearman, of Archives & Museum Informatics, invited the participants to gather together to face the challenges presented by electronic records management. The thirty-five invited attendees, hailing from Australia, Canada, France, Germany, Israel, The Netherlands, Switzerland, and the United States, represented a diverse range of institutional settings, including national archives, state archives, provincial archives, federal and local government records offices, international development organizations, historical societies, consulting groups, private industry, research organizations, and universities. Accompanied by a full compliment of the latest grey literature from active electronic records management programs around the world, the participants set about to address the issues and to find solutions. Through a series of formal and informal presentations, workshops, small breakout sessions, as well as general discussions, the group clarified their concerns over electronic records issues. Over the course of 2-1/2 days, with strong participation from all present, the group reached consensus on many major issues and new directions for implementing electronic records management and archives programs emerged. The emphasis throughout the meeting was participatory and educational with archivists and record mangers sharing their insights and gaining new knowledge. At the conclusion of the meeting, everyone had gained a fresh perspective and concrete strategies for managing electronic records.

The formal agenda, presented below, included lectures/discussions, workshops, reports, and breakout groups. An account of the meeting follows the schedule of events.

April 8

10:00 am - 12:30 am

Introductions

Creating Electronic Evidence
David Bearman, Archives & Museum Informatics

Lecture/Discussion
Functional Requirements for Recordkeeping

Workshop
Metadata for Documentation of Transaction

2:00 pm - 4:30 pm

Making Systems Work
Richard Barry, Barry Associates

Lecture/Discussion
Implementing a Document Management System in the World Bank

Workshop
Policy & Organizational Issues in Systems Implementation

7:00 pm-10:30 pm

Participants Project Reports

Liisa Fagerlund, United Nations
Alan Kowlowitz, New York State Archives & Records Administration
Dagmar Parer, Australian Archives
Peter Waters, Administrative Coordination & Information SystemsDepartment, Ministry of Home Affairs, The Netherlands
Ron Zweig, Institute for Research in the History of Zionism, Tel Aviv University, Israel
Angelika Menne-Haritz, Archivdirektorin, Archivschule Marburg

April 9

9:00 am - 12:30 pm

Planning Disposition

Lecture/Discussion & Workshop
Negotiated Scheduling
Terry Cook, National Archives of Canada

Lecture/Discussion & Workshop
Appraising Active Records (GIS, e-mail)
Michael L. Miller, US Environmental Protection Agency

2:00 pm- 4;30 pm

Managing Active Records
John McDonald, National Archives of Canada

Lecture/Discussion
Office Records Management: Lessons from Project IMOSA

Workshop
Corporate Memory Management

8:30 pm - 10:30 pm

Ad-Hoc Breakout Groups

PIVOT Project
National Archives and Records Administration Proposed Guidelines for Electronic Mail Systems
Open SystemEnvironment and Data Process Models
Switzerland Archives Electronic Document Classification Registration System
Government Information Locator Service Project
Research Agenda

April 10

9:00 am - 11:45 am

Making Electronic Records Programs Work
Margaret Hedstrom, New York State Archives & Records Administration

Lecture/Discussion
Program Strategies

Workshop
Reinventing Archives

12:00 noon - 1:00 pm

A Research Agenda for Electronic Records Management
Lisa Weber, National Historical Publications & Records Commission

April 8

Introduction - *David Bearman, Archives & Museum Informatics*

David Bearman, the convener of this international conference, opened the meeting by announcing that its primary purpose was to inch forward the state of the art of electronic records management. He then presented the first lecture and led the discussion on creating electronic evidence.

Creating Electronic Evidence - *David Bearman, Archives & Museum Informatics*

Bearman introduced the University of Pittsburgh's Electronic Records Project's functional requirements for recordkeeping, noting that they should be seen as an ideal absolute requiring testing in real world environments in order to be concretely realized. What they currently provide is a meaningful framework and benchmark for analyzing existing live systems. Archivists and records managers must intervene to ensure that organizational information systems satisfy these functional requirements. Doing so will provide for the capture of records which will document organizational transactions and ensure accountability.

Bearman's presentation assumed that:

* Not all information systems are recordkeeping systems. Most do not make records because they were not intended to do so.
* Recordkeeping systems capture, maintain, and access evidence.
* Understanding recordkeeping systems is the key to electronic records documentation, control, and management.

Archivists and records managers can transform information systems into recordkeeping systems by linking the transaction which created the data to the data itself. Paper records are bounded by their physical form and explicitly contain many of the contextual characteristics of the transaction to which they relate. Within electronic environments, however, this link can be easily severed or can go undocumented, resulting in less documentation and diminished accountability. As a means of elucidating this point, Angelika Menne-Haritz (Director of the Archives Education Program in Marburg, Germany) related an episode whereby the former East German Republic destroyed the evidence within its electronic systems, not by erasing the data, but by destroying the software which was needed to order and read the data.

Following this theme, Bearman identified the traits which characterize non-recordkeeping electronic systems within organizations today. Non-recordkeeping information systems:

* are common, are the norm;
* reflect the dominant database design methodologies which treat redundant data as wasteful and contributing to inaccuracy; and,
* value timeliness and reusability of data over organizational accountability.

Confronted with this reality, the crucial barrier to be straddled by archivists and records managers is to clearly articulate requirements that will transform electronic information systems into electronic recordkeeping systems -- systems which will capture, maintain, and provide access to evidence, and which will ensure the creation of records that can serve as evidence of organizational activities. Bearman uses a simple equation to illustrate the characteristics required of records in order to make them evidence:

Evidence = Information Content + Structure + Context of Transactions

"Information content" is the actual textual (and/or graphical) data which is the substance of the communicated message. "Structure" is the physical layout of the record, equivalent to the long-held principle of record form. "Context of transaction" refers to the circumstances enveloping the transaction, such as an identification of the record's recipient(s), the date and time of its transmission, etc..

A factor which complicates electronic records management is that electronic information systems are capable of generating new and complex forms of documents, forms which have no direct historical precedent and which also do not automatically generate or capture either the structural or the contextual attributes required for evidence. For example, business rules and operating assumptions can be embedded within the data's structural relations and also written into the software code. However, neither of these are evident upon representation. During the Bush administration, the

Secretary of Commerce gave a presentation to Congress which included graphs drawn from a live feed to a departmental spreadsheet that had certain assumptions built into the software cells. These unknown assumptions affected the shape of the graphs presented (which, by the way, buttressed the Secretary's claim of an improving economy).

Such manifestations are compounded by the fact that much contemporary electronic data resides within an environment which is highly transformative and which participates in a plethora of transaction activity. An individual can be sent a record, alter it, and pass it on to a third party with no audit trail documenting who saw a particular record, what changes were made by whom, or what iteration a participant had access to. The key for archivists and records managers becomes to identify and capture evidence of the transactions in which records participate.

For Bearman, transactions conducted in the course of business carry out business processes and derive their evidential significance from the significance of the business process. Given this premise, a transaction is defined as communication across a business boundary.

Bearman contends that if archivists and records managers explicitly articulated the requirements which saliently define records, they could then identify them and provide for their capture. It is therefore contingent upon the records professions to arrive at a definition for records that explicitly associates them with those important organizational transactions which need to be captured due to their evidential significance.

The purpose of the University of Pittsburgh's functional requirements for recordkeeping is to provide a framework for identifying those attributes which must be satisfied in order to transform information systems into recordkeeping systems. The University's functional requirements for recordkeeping seek to identify those factors which will result in compliant organizations, accountable recordkeeping systems, and functional records.

These requirements derive their warrant from society and can be located in both law and in practice. The development of these requirements is viewed as one strategy to influence the marketplace. Unfortunately, they are expressed by society at a level of granularity not easily translated into specifications which can be adopted within organizational information systems. The University's requirements are demonstrably more precise. However, they too need to be broken down to a deeper layer of definition. What is required is the creation of design specifications -- metadata specifications -- which will allow the functional requirements to be incorporated into organizational information systems. In order to accomplish this, the University's text-based functional requirements need to be more formally expressed as production rules which can be incorporated into software packages. Production rules mandate the capture of concrete metadata which will track and indicate whether or not a requirement has been met. Upon meeting these requirements, only then we will be able to move from data to records. Consequently, the logical flow process requires that we move from the University's functional requirements to metadata specifications. The University's Electronic Records Project is now at the stage of dissecting the functional requirements into metadata requirements that can be expressed as production rules -- in essence, building a metadata model of adequate documentation.

Bearman contends that a serious consideration of these functional requirements will demonstrate how arbitrary and inadequate our traditional paper recordkeeping systems are. Some paper-based records systems, such as the document tracking practices of some U.S. government national security organizations with their sophisticated registry procedures, achieve some of the functionalities mandated by the requirements. However, most paper- based systems fall far short. In stark contrast, electronic records systems can be designed and implemented to capture a much wider and more comprehensive set of contextual data and transactions than paper systems have ever been capable of.

Once articulated, the metadata requirements for records can be satisfied within organizations through four strategies, either individually or in combination: policy, design, implementation, and/or standards. The selection of a particular strategy depends upon an assessment of the four institutional variables: organizational culture, software/hardware configuration, business function, and business sector.

In order to assess their satisfaction, these metadata requirements must be able to be formally audited, either by examining the records themselves or authenticating their linkages to other systems documentation.

Metadata for Documentation of Transactions

To illustrate his points, Bearman then led the attendees through an exercise designed to distill the textual descriptions of the functional metadata requirements into their component elements. These elements could be further distilled into concrete metadata specification production rules which themselves could be incorporated into information systems software.

In order to develop the metadata model, a naming convention has been adopted. This model is composed of four elements: Entities, Attributes, Qualifiers, and Types. Entities, for example, can take on one of six values: Records; Users; Transactions; Recordkeeping systems; Business; or Rules (such as retention rules, laws, etc.). Types can take on values such as: Name; Date; ID; Time; or Number.

According to this logic, the User can be broken down in the following way:

Entity	Attribute	Qualifier	Type
User	Birth	Place	Name

Bearman asserted that by following this metadata framework down to the production rule level we will be able describe all the information needed for keeping records. The University of Pittsburgh Electronic Records Project is currently breaking its functional requirements for recordkeeping down to the production rule level.

Making Systems Work - *Richard E. Barry, Barry Associates*

Rick Barry used the case history of the implementation of an electronic document management system (EDMS) at the World Bank to discuss how archivists and records management techniques must change in the electronic environment. The World Bank is an international lending agency of the United Nations, and was founded in 1946. Initially created to help rebuild post World War II Europe, the World Bank has gone on to finance and promote economic and social development in less-developed countries. The World Bank depends a great deal on documentation; all projects produce a series of standard documents to maintain a history of decision making. These decisions are reflected in memos, issue papers, and reports. In a recent internal report, the World Bank recognized that they are a knowledge-based organization, one in which knowledge and information are a critical asset, and that "the Bank must be organized to best exploit this asset."

During the 1970s, the World Bank quadrupled its lending activities, and used a centralized approach to the archives and records management functions, which required little involvement of the user in records management. The World Bank used the MINISIS automated bibliographic control system. However, by the late 1970s, the Bank began to employ an increasing amount of distributed computing. In 1978-79, one regional office studied using centralized word processing and concluded that it would meet its needs more efficiently. The Bank soon adopted centralized word processing organization wide. The trend toward distributed computing can be seen in the number of terminals per employee at the Bank. In 1977, the ratio was 1 to 100, by 1987, it had risen to a point where there was nearly one terminal for every employee.

During the 1980s, the Bank took a number of steps to take advantage of computer capabilities in its operations. In 1983-84, it adopted information resources management (IRM) concepts, which emphasize information and technology as essential assets to the organization. In 1986 the Bank integrated the information technology and archives/records management functions. In 1987, the UN directed the Bank to lead an electronic records management study; the group, the Advisory Committee for the Coordination of Information Systems (ACCIS), published its findings in 1990.[1] In 1988, the Bank made its first attempts to link the archives and records management functions to the Bank's business processes. The trend toward increasing automation led to the design and adoption of an automated records management package, called the Integrated Records and Archives Management System (IRAMS), which has been used to manage the Bank's paper records.

With the advent, in the early 1990s, of further electronic technology, such as e-mail, the Bank came to realize that it needed a method for handling records in their electronic format. The Bank conducted a self-examination to determine how best to meet these new needs, examining the trends in the Bank's core business, its information management and technology, and its archives and records management. In the Bank's core business functions, there was an increasing emphasis on knowledge transfer and an increase in the distribution of computing components. In information management and technology, they found a rapid diffusion of system control to users and an increasing use of new communication vehicles, including multi- and mixed-media communications. The archives and records management function, it was found, was losing control of the records to document the organization. There was a lack of coordination between paper and electronic files and the costs of maintaining paper files grew to be a concern. Because the users were increasingly responsible for their own electronic records, there was a loss of file maintenance. As a result, electronic records were incomplete; moreover, access to these records was impossible, since they were not globally available.

In order to develop a system architecture that would meet these problems, the Bank conducted a series of workshops to elicit feedback from a wide variety of groups, including external and internal users, Bank information technology staff, representatives of other organizations, and information professionals. They carried out four such workshops in late 1993 and early 1994, one for each of the four groups. Each group offered a different perspective on the requirements for an EDMS system.

Both internal and external user groups focused on access to information as a critical aspect of any system; external users, however, sought more information on past decision making, while internal users tended to need current information to assist in decision making. Both noted problems with gaining access to Bank information, and that the information that they needed wasn't necessarily kept. External users felt that oral history held better information, even though it might be limited in scope; they also felt that finding evidence of decisions was easy, but that finding decision audit trails was not. Internal users were concerned about the amount of time it took to gather and manipulate information. They felt that the information quality needed improvement, and that they needed online access to information currently only on paper. Information technology users tended to look at issues of system management, such as the need for decentralized systems and centralized help. These users were concerned that some form of central control over systems and their content needed to be maintained, while still allowing local control and access. They felt that systems designers should be

1 Operations Information Technology Task Force. Report, 1/29/92. pt.1. Advisory Committee for the Coordination of Information Systems (ACCIS). **Management of Electronic Records: Issues and Guidelines.** (New York, United Nations, 1990).

responsible for setting standards, identifying common information sharing needs, setting strategic direction, and offering infrastructure and support. Conversely, they felt that users must articulate their business process needs and how they must be met. Other organizations tended to suggest that electronic records management systems should be developed incrementally, although most were not as far along in examining the issue as the Bank. Finally, information professionals pointed to changing technology as an area that must be taken into account in electronic records management.

The World Bank used these workshops to create an overview for electronic records management and EDMS development within the Bank. This overview recognized that, for information systems services, there must be differentiation between information management and end user roles and that information systems must take into account organizational processes and missions. Information managers must recognize that the Bank is a knowledge-based organization that is as much in the business of knowledge transfer as it is in financial transfer. As such, the Bank must make every effort to maintain the institutional memory rather than the institutional hardware. Finally, the Bank must better integrate information systems with business purposes.

A number of broad issues needing further attention arose out of the workshops. Legal and jurisdictional problems associated with electronic records need to be sorted out. Support within the Bank for a reengineering of the records management function must be garnered, including a mandate for a Bank-wide information management program. This reengineering process must assess information management delivery roles and re-think document management and records management processes. Further, the Bank has examined policy, business practice, and technology. In policy, the Bank has engendered a broader awareness of electronics records management, as well as exploring in a white paper the issues of legal admissibility of electronic records.[2] In business practice, the Bank has attempted to gain a better understanding of user needs both individually and on an inter-departmental basis. In the technology area, the Bank has considered beta testing digital time stamping technology.

The Bank has begun to take action in several of the areas at issue in the workshops. The Information Management and Technology department has been downsized and reorganized into Organization and Business Practices, and its goals have been more tightly tied to the Bank's core business processes. A desktop mail and file management system integrating word processing and e-mail filing and retrieval functions is in the process of being implemented. The Bank has been analyzing the use of document topologies for creating retention rule strategies and plans to use these topologies to design

2 Rick Barry. Best Practices for Legal Admissibility of World Bank Records in an Emerging Digital Environment. April 5, 1994.

appraisal and disposition programs. In addition, the newly created department has identified several strategies for pushing its agenda in the Bank. These include developing a framework for implementing an EDMS, establishing an internal workshop on EDMS, and developing an Information Management Vision to guide the Bank's electronic records management. The Information Management Vision ties the information environment to the Bank's mission of sustainable economic development, and relies on information technology to facilitate that process. It recognizes that to achieve the Bank's mission, Bank representatives need a wide variety of information readily available and identifiable. This requires stronger information management strategies, plans, policies, and standards.

Policy & Organizational Issues in Systems Implementation

Following Barry's presentation, the group engaged in a discussion about the World Bank experience. One thread of the discussion revolved around the relationship between records management (RM) and information management (IM), and their differing goals and modes of functioning. Of great concern for archivists and records managers is the fact that the needs of RM and those of IM are to some degree antithetical, as the records managers seek to store records over time, while the IM personnel seek to eliminate data redundancy. Thus records managers must find some method of fostering a broader institutional awareness of records management needs in electronic systems so that they are not overwhelmed by information technology concerns.

Another topic of discussion was the issue of using the business process reengineering techniques and how they might affect archives and records management functions. It was noted that using business process reengineering tactics on records management functions would result in records management changing its focus from tangible records to the organization's core processes -- from focusing on the products of business activity to the activity itself. Bearman pointed out that when you focus on appraising business functions and processes, the focus moves away from internal to external actors (i.e., accountability, compliance). We need to get into a regulatory role and still manage records. This would result in greater stability in the records management function, as the activities that the organization conducts change less frequently than the specific ways in which the organization conducts them. The World Bank has embraced a nontraditional view of the role of information and records management in its organization, one where these functions are considered as they fit with the Bank's business. This view has changed these functions, placing a greater emphasis on involving users on an ongoing basis, and requiring more responsiveness to these users' needs.

The session set the tone for much of the remainder of the Conference, emphasizing the need for records managers to adopt practices that are more directly linked to the organization's goals. It also raised the subject of business process reengineering for information and records management

and suggested that these functions must change radically to meet the challenges of documentation in the electronic era.

Participant Project Reports

Participants used the evening of the first day to present reports from their respective organizations. The group received short overviews of projects underway at the United Nations, the New York State Archives and Records Administration, the Australian Archives, and the Dutch Archives. Two brief theoretical papers, one on the historian as the user of electronic records and the other archives and society, were also presented.

Information Management Framework - UN Archives and Records Management Section: Implementation Strategy - *Liisa Fagerlund, United Nations*

The United Nations is grappling with a growth in electronic media which has outpaced its policies and guidelines. It is predicted that the cost of records preservation will escalate. At the same time, a project to migrate their archives management system from obsolete hardware gave the United Nation's Archives and Records Management Section (ARMS) a spring board for the review of its existing services and means to establish a link with the new electronic data management systems (EDMS). This has provided an opportunity for ARMS to re-examine and re-engineer its role. The re-engineering effort has helped ARMS move from a line function to a new staff function predominantly concerned with dispensing advice. It still has to decide the exact domain in which it will give advice.

The re-engineering endeavor has lead to a new team environment in which ARMS plays a key but not leading role. In automated information systems development, the lead player is the Electronic Services Division (ESD), with ARMS providing the traditional records management perspective. The Internal Audit Department is monitoring this process and ensuring compliance.

ARMS has adopted a proactive approach that has moved it to the front of the life cycle. The staff has taken on the responsibility of establishing requirements for the new EDMS. Building on this initiative, ARMS has become involved in evaluating business processes and document types. It plans to participate in the EDMS pilot demonstrations and to use EDMS in the archives. It also intends to assist the internal audit in implementing EDMS by developing a self-audit and an audit checklist, as well as, training auditors in the auditing use of EDMS.

ARMS is considering contributing to other electronic system pilot projects that will have maximum organizational impact. The choice of projects will depend upon client willingness, maximum cost/benefit potential, and the type of electronic systems applications. Strategies for conducting these pilots will include: building up internal resources, creating positions for information systems advisors, and gaining ESD commitment to managing the pilots.

Consistent with its new proactive approach and to promote the United Nations fiftieth anniversary, ARMS has adopted a new goal of community outreach. Possible projects include:

* Internet access
* electronic imaging
* automating the finding aids
* creating organizational authority files
* CD-ROM distribution of selected archival materials

New York State Archives and Records Administration Metadata Projects - *Alan Kowlowitz, New York State Archives and Records Administration*

The New York State Archives and Records Administration (NYSARA) Metadata Pilot Projects are part of that institution's NHPRC-funded Building Partnerships Project. The goal of the Building Partnerships Project is to analyze information management practices in New York State agencies and determine how agency policies, procedures, and tools can support records management and archival objectives. To further these goals, NYSARA is currently involved in an extensive survey of agency policies and practices and is conducting case studies of specific practices.

The purposes of the Building Partnerships Metadata Pilot Projects are to "study the implications of capturing and retaining descriptive information (metadata) in electronic form from a variety of applications for supporting archival and records management functions," and to "demystify metadata" by clarifying its definition and outlining the types and nature of digitized metadata.

In more specific terms, this research seeks to address:

(1.) Technical feasibility and benefits to capture data descriptors and technical information about electronic records in electronic form.

(2.) Economic costs of capture and transfer of metadata to the archives.

(3.) Technical requirements for long term preservation (software platform, standards, migration).

(4.) Potential in supporting an information locator system.

The research approach for the Metadata Pilot Projects focused on selecting software applications that would exemplify the types of metadata an archivist or records manager working with electronic records would confront. The structure, content, and software dimensions of each applica-

tion would be examined and an analysis conducted to uncover the utility of its metadata for supporting archival and records management functions.

Kowlowitz's presentation took place while this project was still underway. Project staff includes one archivist and two technical staff. The technical staff were found to be a tremendous asset to the project's operations. Such multi-disciplinary collaboration was a theme echoed throughout the conference, given that archivists are poorly trained in electronic records management. Work on the project has taken more research and time than had originally been anticipated, due in part to the fact that project staff had uncovered a much greater amount of metadata than had thought would have existed.

So far, six systems have been analyzed:

(1.) State University of New York (SUNY) Central Superbook. This is a digitized version of SUNY's policy manual. This demonstrated the types of metadata resident in a full-text retrieval system and provided insight into the ability of metadata to support indexing and description outside native software.

(2.) Criminal Justice Data Dictionary. This system demonstrated the types of metadata resident in an interagency data dictionary and how it can be used to support the creation of user documentation and descriptive information.

(3.) Jurisdictional Information File Database. This systems demonstrated the metadata resident in a micro-computer database application. The focus here was on the utility and usability of such metadata for understanding and transferring data from a dBase-based system -- i.e., metadata developed in an SQL environment.

(4.) Agricultural Real Property Sales Database. This system demonstrated the utility of program metadata generated by creators and users of a database to document database structures and functions in order to see how well these structures and functions would transfer to other platforms.

(5.) New York State Archives and Records Administration's Electronic Mail System. This system was examined in order to assess what types of metadata such a system would create for documenting message and system context.

(6.) Council on Children and Families (CYIMIS). This systems was used to examine the remnants of the system's data dictionary that currently exists only on paper in order to provide comparative data for the Criminal Justice Data Dictionary and provide insight into the complications wrought by limited documentation.

Based on the research into these six systems, Kowlowitz provided the conference attendees with a set of preliminary findings on the nature, utility, transferability, and preservability of metadata.

By purposefully taking a broad approach in defining metadata as "information about information," Kowlowitz argued that the project was able to glean a great deal about the nature of metadata. Preliminary conclusions reached about the nature of metadata include:

(1.) The sources of digitized metadata are diverse and include more than data created specifically to document data and systems [and can, in fact, exist as] software, programs, or as part of the structure of data or text.

(2.) The form and format of metadata can be very diverse [including such items as] a merged word processing document [or as] codes embedded in text [or as a] header record to a data file, data files, program files, and note fields . . . .

(3.) Metadata is utilitarian and created for very specific purposes tied to systems operations, systems management or user needs. Metadata can be software generated to support the management of a system, produced by users in combination with specific software to support the system and user needs, or specifically by users to fully support user needs. The purpose of metadata will be a major determinate of its form, format and utility for secondary use.

Preliminary conclusions reached about the utility of metadata to support archival and records management administration, functions, and program requirements include:

(1.) Metadata's utility for supporting archives and records management functions are limited by the purpose the metadata was originally created to support. Despite the existence of some parallel requirements of systems designers on the one hand and archivists and records managers on the other (such as data transfer and the need to understand system inputs, outputs, and functions), archival and records management use of systems metadata represents secondary use and secondary use systems may not meet their requirements and needs.

(2.) The metadata created by systems to define the structure and meaning of data appear to support the needs of archivists. The applications examined provided information on "data and record structure and content," useful for documentation purposes.

(3.) Some of the digitized metadata studied [such as program documentation, and input, output, and report formats] provides information on the business function and systems context of records. However, this metadata is limited in its potential uses in reconstructing the

business context in which a system operated and must be used with parallel documentation that is not usually maintained in digitized form.

The research team attempted to migrate resident metadata from its original software environment to a SUN workstation using "SQL-compliant" software or software that was not so rigidly tied to its original environment. For metadata on which a migration effort was not attempted, the research team speculated on the issues that would most likely be confronted if such transfers were tried. Preliminary conclusion regarding the transferability of the metadata studied include:

(1.) Many types of metadata are proprietary and difficult to use in transfers outside of their native software environment.

(2.) Standards could play an important role in the ability to preserve metadata outside of native software environments and in what metadata systems will create. Metadata originally hosted on standard compliant software should be more easily migrated than was metadata not hosted on standard compliant software. However, implementation of standards could have an impact on ease of portability.

(3.) Some metadata will be generated automatically when data is loaded into specific environments, particularly SQL-compliant environments.

(4.) Some metadata must be used in conjunction with actual data to be of any use.

Kowlowitz concluded his presentation by noting that some of the metadata examined, such as data dictionaries, proved immediately useful to archivists and records managers. However, the true usability and utility potential for the types of metadata examined still needs to be tested in actual archival applications in order to see how they can live up to their promise and be integrated into operations.

David Bearman noted that archivists and records managers should look at important business functions to identify what metadata will help preserve evidence of these functions. Archivists and records managers need to explore sophisticated and rigorous systems design in order to see what metadata is possible as opposed to passively accepting the metadata that such systems are now creating.

Australian Electronic Records Management - *Dagmar Parer, Australian Archives*

Dagmar Parer provided a brief overview of the Australian Archives' philosophy concerning the management and care of electronic records. The Australian Archives receives its mandate from the Australian Archives Act which prohibits the destruction of agency records without proper disposal authority. This act also legislates public access to all records more than thirty years old.

The Archives has been involved in the Electronic Records Management Project (ERMP) which was created to investigate four aspects of the management of electronic records including:

* Appraisal
* Management
* Metadata (used for intellectual control)
* Access

The Project has completed the first three phases of the project with the Access phase due in June 1994. Parer explained that the project had not yet decided whether to recommend the Australian Archives take custody and provide access to electronic records or to advocate that records remain in the custody of their creating agency with the agencies providing access to the public.

(1.) Appraisal. The Archives has developed appraisal criteria for government records based upon functional evaluations. The Archives trains the agency staff to carry out appraisal of their own records but the Archives staff signs off on all disposal agreements. Although this appraisal method has worked well for traditional records, agency staff have not yet undertaken any proactive appraisal of major systems.

(2.) Management. The principles which govern the management of electronic data in the Australian government have evolved from the field of information technology. Unfortunately information technology staff often do not differentiate between the archiving of these records and more creation of backups.

Agencies have developed data management principles (DMP) drawn from the computer science literature. The principles in general state:

* know your data
* share your data
* maintain data integrity
* secure your data
* promote system flexibility

The Archives has added to this list the principle "preserve your valuable electronic records." To promote these concepts throughout the government, the Archives has produced videos on the Data Management Principles and on Access.

The management of electronic documents requires considerable effort and expertise. Many offices have not yet designated anyone responsible for the retention of electronic records and subsequently many valuable records remain on personal hard drives, virtually inaccessible and unprotected. Presently the Archives recommends that government staff create hard copy print outs of all records resident on the hard drives of personal computers and transfer these records to the registry. To help agencies manage their records, the Electronic Data Subcommittee of the Information Exchange Steering Committee (IESC) has published the booklet "Management of Electronic Documents in the Australian Public Service."

Parer posed the following two questions to the participants:

* How do you get agencies to institute and comply with disposal authorities?

* How are participants identifying appropriate electronic document management packages?

(3.) Metadata. The Archives lacks experience in the appraisal of major automated systems. The metadata descriptive information they developed is still at a very broad level and is not intricately identified.

(4.) Access. Parer outlined some of the issues that challenge the ERMP as they attempt to develop their recommendations on the custody of and access to electronic records.

* If the Archives accepts custody of a major government information system, some of the system's sophistication may be lost with migration.

* With custody, the archives will become responsible for maintaining access to sophisticated data structures.

* If the records remain in the custody of their creating agency, access problems may arise because of the agency's resistance to sharing its data.

* Resistance based on cost is no longer rational, but the issues are complicated by a lack of a common software interface.

Obtaining agency compliance to facilitate networked access continues to challenge the Archives. It will have to undertake a thorough appraisal of the records before it makes a full commitment to continuing custody by the agency. Many of the records may not be worth preserving. For the present, the Archives simply stores any electronic records that it accepts into Archives custody.

To implement new procedures will require a change in the corporate culture. The archives will have to convince the agencies and Australians that

new policies and guidelines are necessary for the ongoing preservation of their "valuable electronic records."

PIVOT Project -*Peter Waters, Administrative Coordination & Information Systems Department, Ministry of Home Affairs The Netherlands*

Peter Waters gave two separate presentations describing the PIVOT project undertaken by the State Archives of the Netherlands: one during the participant project reports and the other during the breakout sessions. The two sessions have been amalgamated into one report.

The PIVOT project is an ongoing attempt by the Archives to attend to backlogs anticipated when a new Public Records Act takes effect there. Facing the prospect of a huge transfer of records to state and municipal archives -- estimated at some 500 linear kilometers -- the Archives recognized that they were likely to face increasing backlogs if they followed traditional appraisal techniques. Traditional techniques, which focus on sifting through records after they have served their primary function, would be unable to keep up with the flood of records entering the system. They therefore made the decision to reevaluate and redesign these techniques. The situation was pointed out in a 1988 report by the Dutch General Audit Office entitled *State Records Management and Maintenance*, which found problems familiar to many archivists and records managers. First, there were huge amounts of unsorted records that remained outside the control of the State Archives as records creators often were unaware of their recordkeeping obligations, and there was no policy oversight for records management. Second, records creators were not transferring records to the Archives in a timely manner, which resulted in incomplete documentation. Third, records of permanent importance often were not separated from those of transitory importance. Finally, the increased role of government in the post-1945 period has resulted in an alarming increase in the volume of material to be transferred to the State. This ballooning of documentation would become an explosion when combined with pending changes in the Public Record Act, which would mean that a large block of these records -- covering a thirty-year span -- would enter the Archives at the same time.

The PIVOT project was established to take a proactive, rather than reactive, position on these problems. The State Archives realized that to achieve better records management in the government, it needed to reevaluate its processes from the ground up, beginning with a reevaluation of why records are kept. To begin with, the members of the PIVOT project concluded that the primary reason records were kept was to enable the originating organization to operate efficiently, rather than to serve users such as the public or historians. This realignment in purpose changes appraisal from a process that examines records of an organization after the fact to one that examines the functions and processes of the organization as they are carried out. It was felt that changing the focus of appraisal from the records created by an agency to that agency's functions and processes would improve

the efficiency of appraisal so that backlogs could be controlled. Using a functional orientation enables the PIVOT program to evaluate entire classes of documents for their significance, rather than making this judgment on a case-by-case basis.

One result of this shift in appraisal is a transformation of the priorities in recordkeeping. PIVOT holds that records meet their purpose only if they add to the goals of the organization. Thus, the purposes of recordkeeping should be:

(1.) To support primary business processes;

(2.) To make organizations accountable;

(3.) To provide audit control of organizations;

(4.) To meet the needs of the citizens; and, finally,

(5.) To meet the needs of cultural and historical research.

PIVOT approaches records management believing that the primary stakeholder in the records of government is the government itself, rather than the more traditional view that the historian is the primary audience. Moreover, PIVOT argues that archivists cannot know all the parties who may wish to use records, and that these diverse stakeholders must identify themselves and defend their needs. This has already occurred, for example, in legislation that protects the interests of those outside government. PIVOT believes, however that this change in priorities will have little or no impact on historical and other external interests, since PIVOT provides for a reconstruction of archival materials in relation to society.

The PIVOT staff felt that changing appraisal from a records focus to a functions focus would alleviate many of the problems they foresaw for their records management programs. It would enable large quantities of materials to be appraised based on the organizational task to which they applied, thus potentially reducing the backlog. Focusing on the organizational processes makes records management a more integral part of the mission, thus making records creators more likely to see the benefit of good recordkeeping practices.

Appraising organizational processes will create a more stable recordkeeping environment because organizational functions remain more static than the ways in which those processes are documented.

Up to 1991, the traditional records management regulations prescribed detailed and uniform procedures for documenting and managing records. With PIVOT, new records management policies were developed and implemented in 1991; these encountered some resistance from records managers who felt that the new methods were destroying their techniques. They needed to be convinced that the primary purpose was to improve appraisal and scheduling, not eliminate it. Waters presented e-mail as an example that

poses some of the issues that archivists in PIVOT are confronting. Formal e-mail messages can only be documented successfully if done by the creator, and there must be easy-to-use criteria for distinguishing formal and informal messages. In addition, it is important to create a method for automatically assigning context to e-mail messages. Relying on traditional records management methods has not worked; PIVOT will provide a better framework for handling this type of record.

Waters concluded by reflecting on future archives and records management methods, and records and information needs, in relation to this new policy to underscore a movement away from present methods and techniques. First, he suggested that additional metadata derived from the contents of records may be needed to identify processes on the institutional level for the interests of cultural and historical researchers. Second, a typology of government processes is needed, as is an instrument for analyzing government processes. The instruments available are inadequate for analyzing the information needs of governments. The Dutch have initiated a project to develop such an instrument. Third, PIVOT raises questions about the future of archives and records management: will they depend on myriad practices, each based on a different set of functions? Finally, Waters projected that within five years all Dutch ministries will have been researched by archivists and the PIVOT model will have collected data on all aspects of that model.

Historians as Users of Electronic Records - *Ronald W. Zweig, Institute for Research into the History of Zionism*

Ronald W. Zweig, from the Institute for Research into the History of Zionism, provided the group with a different perspective on electronic records -- that of a prospective historical user. Zweig pointed out how the historian's pursuit has been complicated by the "electronic generation and preservation of textual records" and voiced concerned over his profession's reluctance to confront this challenge, particularly within the United States. As recently as 1994, the American Historical Association rejected a joint proposal from the Association of History and Computing and the Society of American Archivists to organize a session on electronic records at their annual meeting.

By failing to train the next generation of historians in electronic records issues and by failing to serve as front-end advocates for the preservation of electronic media, Zweig charges his profession with foregoing the opportunity to be "present at the creation" of standards and practices for electronic recordkeeping. Zweig feels that such efforts could go a long way in influencing the design of electronic office systems and encouraging legislation that would require government offices to preserve their electronic communications for future use.

Speaking at the end of the first day's proceedings, Zweig stated that he felt "completely depressed" by the problems associated with electronic

records management that had so far been presented. To his eyes, electronic information systems are currently managed by young computer scientists who don't seem to care about the records in electronic information systems nearly as much as had the civil servants of old cared about the records in their paper recordkeeping systems. The transformation towards increased computerization has not only exacerbated the erosion of well-established paper recordkeeping practices, it has also surfaced the problems inherent in physically preserving electronic records. Each of these have contributed to the widening "Black Hole" of organizational documentation. Taken together and left unaddressed, Zweig posits that these shortcomings will have a dramatic and traumatic impact on the discipline of history. Historians are interested in tracing organizational decisionmaking trails -- the formulation and implementation of policy and the processes by which such events occur. Records are the evidence of these transactions. Without records of organizational actions, it will be increasingly difficult to say anything of true substance.

To counter this dismal forecast, Zweig pointed out that electronic information systems also hold out great promise for historians. He argued that properly modelled electronic office systems could provide a far richer palette of contextual data, allowing historians to "broaden our understanding of the manner in which governments and organizations work." Zweig reminds us though that we have a long distance to travel before realizing this promise. Attaching contextual metadata to records is seen as offering a ray of hope, and Zweig goes so far as to assert that such metadata is more important than the content of the records themselves. Properly modelled metadata (which Zweig refers to as "usage attributes" in his contributed background paper) is crucial for understanding the decisionmaking process since it can answer the who and when type of questions. With functionally robust electronic information systems it will be possible to, figuratively, trace all of the "fingerprints" that touched a particular document. Such systems will allow us to:

> Record how documents are used . . . . Office systems track the creation of a document, its evolution through various drafts by different authors, and its movement through the organizational hierarchy. We can know who received it, who read it, who annotated it. We can reconstruct how widely it was distributed amongst decisionmakers. Its system priority, security level, and entire life cycle can be know[n] in ways we can only rarely reconstruct from the extant records of conventional documents. As any contemporary historian will appreciate, extraneous pieces of evidence, such as distribution lists and signed receipts for a document, can give valuable additional information about the significance of the documents to which they are attached, even when only a few such chits are attached to a small percentage of the records in archives. The electronic version of a document can be designed to retain the usage attributed in a complete form.

Zweig adamantly asserted that such metadata will allow researchers to focus on intra-organizational processes as opposed to focusing on the actions of individual units, thus liberating study from what he intriguingly calls the "tyranny of provenance." This tyranny, a product of the extant organization of paper record systems, induces tunnelvision. Zweig contends that the access renderable through electronic recordkeeping systems could provide information on a topic which cuts across organizational boundaries, as opposed to having to comb through individual fonds for information on the same topic, a chore that sorely stretches most scholars' limited primary research time within archival institutions. Well designed systems will enable the historian to "illuminate the flow of the decisionmaking process and isolate important nodes of authority by studying how documents are used. Ideally, it will be possible to map this process through the machinery of government."

It is Zweig's further hope that electronic information systems will allow researchers to transcend their narrow research interests and facilitate their understanding of the wider context it fits into (i.e., "make it possible to examine the subject headings of other documents that . . . crossed the desks of decision makers in any defined period") and how it was impacted by concurrent policy discussions on other topics.

As a way of elucidating the promise offered by well-designed electronic information systems, Zweig pointed to an example offered in Edward Luttwak's book on engineering coup d'etats. Luttwak noted how the CIA was able to quite accurately predict military coups in African nations by measuring the volume of electronic broadcast traffic (characterized as "noise"). Zweig posits that this principle can be transferred to electronic recordkeeping systems -- and wonders what patterns and insights will emerge from examining the "noise" in electronic recordkeeping systems.

In the absence of new skills and redesigned systems, it is feared that historians will lose some of their independence. In the paper realm, historians generally required no assistance once the records were provided. In the electronic environment, they will have to increasingly count on the archival and library professions to serve as technological gatekeepers to records of interest. These information professions will be relied upon to not only provide access to the materials, but will be called upon to interpret and analyze them as well -- a situation which ill-befits all concerned.

As a final point, Zweig pleaded that the assembled archivists and records managers shy away from electronic conversion projects of paper documents, arguing that such efforts are a "tremendous waste of time."

Archives and Society - *Angelika Menne-Haritz, Archivdirektorin, Archivschule Marburg*

Angelika Menne-Haritz reviewed theoretical aspects of the current discussions concerning the role of the archivist. She examined three different demands that affect the archivist's work.

> (1.) Records must document cooperative purposes. Directed transactions have grown in all spheres of society, including the state, municipalities, unions, groups and the media. This growth in records has created an increasing need for specialists to preserve the traces of these transactions.
>
> (2.) Society needs to preserve and access its collective memory. Whether for political means, education, for corporate identity of firms, enhancements of a community's image, or for personal or private identity the desire to link with one's memory is increasing in every sector. This desire has resulted in a perceived need for specialists who can create traces to the past and to traditions.
>
> (3.) Archivists are charged with securing the common capabilities of remembrance. Archivists must preserve the past to protect society from a loss of public memory. Their role is the "Prevention of Amnesia." To render this service, archival methods must be:

* analytical and functional, not descriptive;
* oriented toward formal signs and emphasize the context of the material over the contents of the records; and
* autonomous, i.e., not derived from other disciplines.

Menne-Haritz posited that archivists are the only specialists with the theoretical background to protect evidence and make it accessible. To make the records accessible they must ensure that the users know why evidence is kept. Evidence, she said, provides a view of an organization's procedures and makes them visual. It also preserves nonverbal information contained in the record. To protect the evidence of records, archivists must ensure their authenticity. They must understand that records result from the steering and controlling processes of an organization.

Records are not created for historical purposes. They are an intellectual working tool needed for cooperative decisionmaking. An organization creates them because they are required to execute controlling and steering functions. To carry out these functions the records must be up-to-date and complete.

Records can provide valuable insights into how an organization functioned, but to fulfill this objective they must be accessible and open. To make records accessible they must be processed and described. Archivists must also provide users with information about what they preserve and why. They must supply the users with a justification for their appraisal decisions, so users can understand the rationale behind the keeping of these records.

Menne-Haritz suggested that provenance does not refer to the physical origin of the records but rather to the administrative origin of them. She argued that archivists should concentrate on the functional aspects of the records including the competencies of their creator rather than the organizational structural unit from which they emanate.

She rejected the assumptions of the documentation strategists, noting that archivists cannot document society because information can never be objective. Records are created for a purpose and archivists must concentrate on understanding the purpose of the records' creation instead of the informational content contained within the records.

Menne-Haritz reviewed Schellenberg's writing on appraisal and his theories on the value of archives. Primary value concerns the purpose of the records creation including: steering and controlling, internal individual procedures, the delivery of information for decisions, and documenting decisions, as well as the forms of the records, including notes, reports, and memoranda. Associated with the primary value of records is their primary purpose or the organization's steering and controlling processes. Organizations create records to ensure that other agencies or divisions perform necessary tasks that they themselves can not execute. They create the records to control or steer the actions of the other agencies.

The secondary value of archives embodies why the records are preserved. It is for their evidential value which encompasses what can be discovered by studying the records including patterns of processes, procedures, aims, and mandates. They are also preserved for their informational value which is dependent upon their uniqueness, the concentration of information in the records, and the historical importance of the information. Evidential value is revealed in the documents but is not necessarily written down.

To appraise electronic records, archivists must study the primary purpose that the records were meant to fulfil. They should focus their attention upon the steering and controlling function of the organization to identify electronic records that require preservation.

April 9

Planning Disposition

Negotiated Scheduling - *Terry Cook , National Archives of Canada*

Terry Cook described the appraisal practices at the National Archives of Canada (NAC), which has committed to a research-based macro-appraisal

technique, emphasizing an analysis of the functions of an organization or agency rather than the records which that agency produces. First, Cook briefly outlined the history and development of the National Archives of Canada (NAC), pointing to several key legislative developments that had impact on NAC's functions and operations. Among these were:

* The Access to Information and Privacy acts, passed in 1983, which had a tremendous impact on the archives because they dictated that all information had to be described before its disposition.
* The National Archives of Canada Act, passed in 1987, which stated that the definition of government records included all media and gave NAC authority to determine the disposition of all records. This doubled the number of institutions for which NAC would have responsibility.
* The Management of Government Information Holdings (MGIH) policy, passed in 1989, which dictated that each agency had to create a departmental history. This policy led to the development of the government's Infosource. The deputy head of each division became responsible for ensuring that the key policies and activities were documented.

These legislative events forced NAC to reconsider its appraisal techniques, leading to a reorientation of priorities. Instead of traditional archival appraisal, in which the archivist focuses on the importance of records for secondary research, the archivist now tries to understand and document the functions, programs, activities, and recordkeeping systems of institutions which produce both records and evidence of government action. This approach follows the theories of Margaret Cross Norton, who said that records follow functions and functions lead to activities and programs. Thus, records must be understood within the context of the function that generated them. With this new method, archivists identify records with high archival value by analyzing which record creators have the most important functions and thus would have the best, most succinct records, based on the institutional structure. After all the functions are identified, then the archivist looks at the records. Cook called this ranking of functions "negotiated scheduling." With macro-appraisal, records are identified globally -- not medium by medium or division by division. Instead, NAC insists on a government-wide records management plan that includes all the divisions in Canada. The plan includes the identification of sites ranked in priority order which has been determined by weighing the importance of the division's functions. NAC only accepts record schedules if they relate to functions. Cook listed nine factors that are included in setting the priorities, which are also outlined in his article "Mind Over Matter"[3]:

(1.) The character of the institution within the government as a whole;

(2.) The breadth and diversity of the functions of the institution;

(3.) Its formal leadership;

(4.) The number and complexity of the laws for which the institution is responsible;

(5.) The seniority and rank of the institution within the larger organization;

(6.) The size of its budget, number of employees;

(7.) The complexity of its internal structure;

(8.) The existence of gaps in the institution's archival holdings; and

(9.) Known threats to the safety of the records.

Considering these factors requires archivists to dedicate themselves to sustained and intensive research. The archivist then becomes an active documenter, conducting research to understand and appraise the functions of an agency, not its records. The macro-appraisal methodology includes examining the relative degree of importance of different functions and it must cut across agencies when identifying functions. Archivists then establish a set of hypotheses when they appraise records that mirror functions.

In ranking institutions, the NAC focuses on the most complex and powerful institutions first, and concentrates on one institution at a time, studying them in depth. In this top-down process, archivists must also be sensitive to functions that are poorly documented and have to be complemented by personal records. When evaluating divisions, archivists must consider the following factors:

(1.) They must weigh functional leadership; that is, identify clusters of inter- and intra-agency functions.

(2.) They must consider access issues; that is, the breadth and depth of functions of each unit.

(3.) They must unravel the nature and degree of autonomy of the field departments.

(4.) They must trace information from the field office to headquarters.

(5.) They must understand the nature of programs in the departments.

3 Terry Cook, "Mind over Matter: Towards a New Theory of Archival Appraisal," in **The Archival Imagination: Essays in Honour of Hugh A. Taylor**, Barbara Craig, ed. (Ottawa: Association of Canadian Archivists, 1992): 38-70.

(6.) They must identify specialized research labs; that is, those organizations that require their own attention.

Once key functions are appraised, then archivists appraise individual records, which should serve as a confirmation of the previous appraisals based on function. Within the macro-appraisal framework, masses of records can be destroyed without the archivist having examined any records. Cook characterized the technique by saying, "the last thing an archivist does in appraising records is appraise records." NAC is now involved in evaluating lower functions of the Canadian government and is looking at the more common functions of the agencies. After the analysis is completed at the agency level, then archivists will move to examine the internal branches and their functions. Macro-appraisal requires a firm commitment to allow the archivist to do research into the organizations they document. In using this functional methodology, NAC has encountered several key appraisal questions: First, what functions, processes, and transactions best document the government/citizen interaction? Second, how does the archivist determine which functions are important ones? And, third, who would have created these records?

Cook closed his talk by discussing some continuing problems that NAC has encountered in implementing this macro appraisal methodology. First, in analyzing functions, processes, and transactions in our appraisal approaches, how do archivists deal with the realities imposed by structures? Processes often transcend single organizations or divisions, and the records that document these processes must be stored in different locations. NAC has not determined a policy for these situations. Second, if the focus is on functions, how are they to be determined, defined, and isolated? Definitions of functions are imprecise and vary from organization to organization. Third, what precisely are NAC archivists appraising: functions, structures, some matrix of the two, or recordkeeping systems? Given the realities of organizational structures, this question becomes critical. Fourth, what is to be the relation between appraisal and the growing number of gateway/thesaurus-based/information locator or umbrella systems? And finally, are there conflicting appraisal ideals of archives supporting business accountability and archives as the backbone of heritage and culture?

Following Cook's presentation, attendees separated into several smaller groups to discuss the questions that Cook posed at the end of his presentation. In the group discussion that followed, a number of additional questions arose. Some questioned whether series had any meaning in the macro-appraisal methodology. In relation to the question of relating function to structure, it was pointed out that processes can and do change, but business functions remain the same. The concept of the function was explored, and it was decided that a function is the purpose of an organization. Below this are processes, which ensure that a function is carried out and how it is carried out. Some suggested that the archivists at NAC needed to develop a functional template which maps functions and processes against who is responsible. For example, Australia appraises by functions, defining for immigration that the functions are issuing visa and granting citizenship. Policies relating to granting visa are therefore related to the process of carrying out the function.

Several other specific comments were also made. Alan Kowlowitz saw the macro-appraisal model as a refinement of traditional archival appraisal, not a major theoretical breakthrough, although it does represent an improvement. Margaret Hedstrom noted the conflict between the archives that serve government needs and that which serves the public needs. But she felt that public service cannot be accommodated unless accountability is served. Disposition and appraisal activities, she felt, serve two different constituencies, the government and the public respectively. Richard Cox pointed out that if archivists do one well does it serves the other. If archivists focus on evidence and preserve evidence well, archivists will serve informational needs as well. Dagmar Parer explained that agencies in Australia do their own appraisal, with training and advice given by the archives staff. The quality control comes from the training, where archivists train agency staff to identify those records that contain the sharpest, clearest picture of what the agency does. This method must build on the knowledge that agency staff have and requires the archivist to find the key person in the agency who knows their records.

Appraising Active Records (GIS & e-mail) - *Michael Miller, U.S.Environmental Protection Agency*

Michael Miller of the U.S. Environmental Protection Agency (EPA) offered a commentary on the problems associated with scheduling and appraising electronic records in a modern office, drawing upon case studies of electronic mail and geographic information systems software applications to illustrate his concerns.

The EPA is a decentralized agency with a flattened hierarchy. EPA employees are "knowledge workers" who possess a great amount of autonomy and who are primarily results oriented. Though the agency is highly automated (with a turnover of roughly 200 systems per year), it continues to produce a great volume of paper records. Unfortunately, the agency possesses a poor recordkeeping history whose control has been distributed across a myriad of programs. Such a legacy has inhibited an integrated approach to archives and records management. Finally, employees are more data oriented than records oriented. As a consequence, EPA staff are remiss in seeking out or accepting records management advice.

In Miller's view, deficient organizational recordkeeping will become magnified across all types of organizations as they embrace such contemporary notions as downsizing, rightsizing, streamlining, hierarchical flattening, decentralization, and reinvention. This is an important point for

archivists and records managers to recognize since such organizational restructuring has become increasingly popular in all types of institutional settings. When coupled with increased computerization, these transformations are likely to create situations where the ability to capture documentation in a predictable and reliable manner will decrease in proportion to the changes rendered.

In order to meet organizational needs and accountability requirements within these new and emerging contexts, Miller asserts that the archival and records management professions must confront and address the following questions:

* What exactly are our recordkeeping requirements?
* What constitutes a record in the electronic realm (especially for federal agencies which must satisfy the requisites of the Federal Records Act)?
* What do we want to document and why do we want to document it?
* What kinds of records need to be created?
* What kinds of records need to be retained beyond their active life within the creating agency?
* In what format should records be retained?
* For how long do we need to retain different types of records?

Miller did not stop there. He pushed the conference attendees to meditate on what exactly it is that we need to preserve. Is it:

* Final products of decisions and activities?
* All records necessary to support an agency function?
* Only those communications which meet the formal definition of records? (Or should we also include those communications which do not meet formal records definitions, i.e., non-records?)

In struggling with these issues, Miller raised an interesting question. Are archivists and records managers working in electronic environments pushing to achieve a higher standard for electronic records systems simply because they can or because they need to respond to new demands?

To illustrate and flesh out these concerns, Miller focused the remainder of his presentation on electronic mail and geographic information systems software applications.

Electronic Mail

A dominant intra- and inter-organizational communication utility, electronic mail can accommodate a wide diversity of documentary forms, such as announcements, drafts, simple question-and-answer messages, policy development and other formal memoranda, technical directions, directives, and reports. In Miller's opinion, electronic mail presents archivists with a utility which is relatively easy to appraise on a theoretical level but which remains difficult to appraise and manage on a practical level. For him the key questions are how to determine what messages need to be preserved as part of the ongoing documentation of an activity, what types of contextual information must be preserved along with these messages, and how can a recordkeeping system be established to manage messages given the complexities of modern organizations.

A summary document distributed by Miller, dated 4 February 1994, outlines the EPA's current records management policy on electronic mail. In part it states that the EPA "considers electronic mail . . . to be a business utility [and] not a system of records." As a consequence it contends that "the vast majority of the messages are either non-record or fit the National Archives and Records Administration's definition of a transitory document." In meeting its records management obligations. the EPA ensures that "all e-mail messages necessary for the adequate and proper documentation of agency business are retained for the period of time required by the Agency records disposition schedules . . . " In defining the electronic mail "record," the guideline notes that "complete" records must include, aside from the actual text making up the body of the message, such contextual information as the "date of the message and the identities of the sender and recipients." This follows the contextual requirements identified by National Archives and Records Administration guidelines for electronic mail systems issued in March 1994.

In regard to the appraisal options for messages in an electronic mail system, Miller listed the following possible scenarios:

> (1.) Define records very narrowly and make most of it a non-record. (This option was suggested to Miller by a Management Information Systems person in a federal agency. This option drew the objection of David Bearman who commented that, based on the Profs case court rulings, one could be criminally charged for implementing such an approach. This option is further complicated by the problems associated with predetermining what records are relevant to a decision trail before that trail is fully formed.)
>
> (2.) Set up a "drop box" or boxes as recordkeeping systems and appraise the contents of the drop box based upon the ultimate importance of the project it documents. (This option is technically feasible and would require no dispose/retain decisions to be made by individual

employees. Drop boxes could be defined and appraised based on either the importance of the project the messages relate to or on the level of the office creating the messages.)

(3.) Link the messages to the appropriate series and appraise based on that series' retention. (Here you would establish common or parallel recordkeeping systems for all media and implement standardized retentions.)

(4.) Appraise by content of the message using an Artificial Intelligence approach. (The difficulty in implementing such an option would be that it is often hard to appraise content in the absence of the context of the messages; i.e, the same message may likely hold varying degrees of importance depending upon its alternating contexts -- such as the sender versus the recipient. This option, like the one above it is compounded by the requirements to link individual messages to other forms of related documentation.)

Given this range of possibilities, where does an electronic recordkeeping systems make sense and how can one build a business case for creating an electronic mail recordkeeping system? Miller suggests that a business case can be argued for applications that are: small and focused; of great importance; likely to be supported over time; likely to generate a great deal of interest; supported by adequately managed documentation; amenable to central storage and management; and that can provide easy instructions for determining record status and identifying individual series.

Miller provided the example of the National Labor Relations Labor Board (NLRB) case files as a key candidate for an electronic information system to which archivists and records managers could create a business case for their use as an electronic recordkeeping system. Pertinent records in the NLRB case files are easy to identify given that they are composed of only two series and that all case files are numbered. They are worth preserving since they are regularly used in litigation. And they are complemented by and parallel existing paper case files which are well ordered and well managed. Building off this example is one way to start thinking how one would build a business case for creating an electronic recordkeeping system for managing electronic mail records. As they are currently constituted, most e-mail systems do not qualify as recordkeeping systems. Recordkeeping systems collect, organize, and store records in order to permit their preservation, retrieval, use, and disposition. They should also ensure that the functional requirements for recordkeeping, as developed by the University of Pittsburgh's Electronic Records Project, are satisfied.

At this point, the discussion shifted over to how we would determine what is and is not a record. David Bearman asserted that users enter the e-mail system not to send an e-mail message but rather to fulfill a function. In light of this, we need to create front-ends or style sheets which make the user select

a form of the message specific to the function before a record is allowed to be created and sent, essentially providing a functionality that allows for a binding of the content, structure, and context of a message with the business process which produced it. In this way the recordkeeping function could be built into the e-mail software application.

Upon this, Miller asked for suggestions that could be used in convincing organizations to transform an electronic mail application into a recordkeeping system? Respondents offered that archivists and records managers could build and then provide the tool that would do this. They could also make the case to the market that there is a dire need for such a tool. In addition, they could oversee the development of a topology of business processes that could serve as the basis of the front-end scripts proposed by Bearman. Another participant noted that archivists and records managers could try to gain a co-sponsor in the legal counsel's office. Alan Kowlowitz argued that the problem with electronic mail is that it reflects the existing underdevelopment of corporate recordkeeping functionalities and what we need to do is to analyze offices that have successfully managed their electronic mail and then try to migrate their practices into other environments.

Finally, Miller also handed out a draft proposal for a disposition schedule for an electronic mail system. The draft "covers all messages of all types transmitted over any electronic mail system." An electronic mail message is defined as including the following basic contextual information: sender, recipient, and date. The document states that it is up to both the sender and the recipient to determine the record status of messages, and that messages that qualify as records need to be linked to all other messages they are related to. It also states that electronic mail records can be retained in either hard copy or electronic form. Transitory records can be deleted after 90 days and non-records can be deleted when they are no longer needed. Records that meet the requisites of the Federal Records Act must be integrated into an official recordkeeping system and be disposed of according to an existing disposition schedule. System backups should be maintained separately for electronic mail messages, kept for 90 days, and then reused. The most recent version of system files (which contain such information as the identity of users, passwords, mailing lists, and the like), should be kept and disposed of when they are no longer needed. Such information should normally be kept as part of the 90 day backup cycle. A complete set of system documentation necessary for the use of permanent records should be retained. Inactive or superseded documentation for permanent records should be transferred to a federal records center, and twenty years later, to the National Archives.

Geographic Information Systems

Unfortunately, due to time constraints Miller did not get very far into this part of his presentation. When compared to electronic mail, geographic information systems (GIS) present the records manager and the user with a completely different set of issues to deal with. Archivists and records

managers need to figure out what aspects of GISs, including their uses, need to be accounted for as part of the overall documentation of the parent agency's activities.

In the archival context, "GISs have been appraised largely for their informational value and their ability to support secondary research." In his presentation, Miller proposed how the notion of evidential value could be incorporated in the appraisal of such systems.

GISs compute and analyze data so that a geographical display could be generated, the presentation altered depending upon what criteria contribute to the created image. Since the data fed into a GIS can be constantly changing, each graphical representation can be different than the one before it. As with electronic mail, the key question becomes what types of contextual data need to be associated with use of GIS? Miller proposed that the following types of "Run Documentation" metadata be captured, in either hard or electronic copy, to provide GIS systems with evidential value:

* Who, what, when, where, why
* Files retrieved
* Data selected for inclusion and their parameters
* Modeling formulae and their manipulations
* Run results

In Miller's eyes, this information is the most important part of GISs. Given these requirements the key appraisal questions become:

* When and for what purpose do you need to capture this run documentation metadata?
* How do you capture it? (i.e., as a footnote? how much of it?)

Implicit in Miller's run documentation metadata requirements is the necessity for developing guidelines that tie business processes/functions to the uses of these systems. This is the bottom line for all electronic information systems that need to be transformed into recordkeeping systems. One difficulty in transforming such systems into recordkeeping systems is that they will produce incredible amounts of redundancy. David Bearman argued that the archival and records management professions will just have to accept and deal with this aspect, even though they know that it infuriates information technology staff. One strategy offered was to agitate and shift the policy framework to support this position.

Managing Active Records - *John McDonald, National Archives of Canada*

John McDonald, of the National Archives of Canada, described the findings of the Information Management and Office Systems Assessment (IMOSA) project. Based on these findings, he hypothesized that information management is on an evolutionary curve that will result in the redesigning of computer screens to represent business processes and functions rather than utilities. Currently most computer screen icons are applications-based and are used to access a particular type of software, e.g., word processing, e-mail, spreadsheet. In the future, to improve the efficiency of carrying out business activities, icons will represent business functions, e.g., registering, procurement, personnel. McDonald posited that archivists and record managers must insert themselves in this evolutionary process by developing more relevant management strategies for electronic recordkeeping systems. These strategies should assist organizations as they move from the frontier of information management to accountable business practices. To meet this challenge, organizations will need to discover what it means to keep a record in an electronic environment and to determine functional recordkeeping requirements. These requirements will provide the foundation for office information systems which protect integrity and authenticity of the corporate memory.

IMOSA is a project to assess functional specifications for the management of information in integrated office support systems. It grew out of earlier work conducted under the rubric of the Office Communication Systems (OCS) Field Trial Program (1983-1986). These field trials linked 70 users through a local area network to study the impact of technology on the management of information. Based upon their experience with the Field Trial Program, the National Archives of Canada, in conjunction with the Department of Communications and Provenance Systems Inc., developed preliminary functional requirements for managing electronic documents in an office system. These requirements were published in 1990 under the title "Managing Information in Office Automation Systems: Final Report on the FOREMOST Project."

At the completion of the FOREMOST project, the Treasury Board Systems Standards Working Group recommended that the functional requirements be tested in an office setting before considering government-wide adoption. The IMOSA project was established to:

* design, build, implement, and evaluate a prototype software application based upon FOREMOST's functional specifications;
* evaluate the effects of introducing new technology into an organization;
* develop practical methods to help people manage their electronic records;

* facilitate the corporate management of information in integrated office support systems through the assessment of procedures and guidelines to incorporate such software into the workplace environment.

IMOSA's architects realized that, to successfully fulfil all of these objectives, they would need to draw upon expertise from government, the private sector, consultants, vendors, and academia. IMOSA's work was carried out by multidisciplinary teams which investigated information management issues and utilized users groups to evaluate all software. The project included three separate phases. The first phase, beginning in January 1990, developed and evaluated prototype software based upon the functional requirements developed by the FOREMOST project. Phase two expanded the existing requirements by including filing and retrieving functions that addressed the retention and disposition of electronic records. It also developed two user guides. The final phase undertook a number of research projects associated with these functional requirements, such as the assessment of integrating image processing and multi-media systems with corporate management applications.

The concrete products developed during the three phases of IMOSA included:

* a comprehensive set of functional requirements that supported consistent, corporate-wide information management;
* software that mimicked a recordkeeping system and handled filing, version control, as well as retention requirements;
* a guide to advise users on how to build and use file directories that were consistent across the organization and supported a corporate approach to classification. This guide attempted to help users understand that they created and worked with corporate documents that needed to be properly managed;
* a guide on managing group space which attempted to help users manage their own environment and progress from a focus on their personal computer space to a corporate view;
* a thesaurus study conducted by the University of Laval;
* a survey of the software industry that identified companies producing applicable software;
* a blueprint to reduce the cost of software;
* reports on the project.

Less concrete but of equal importance were insights gained concerning the evolution of recordkeeping systems. They discovered that office systems are evolving in the following ways:

* from utilities (i.e., e-mail, spreadsheets, etc.) to applications (i.e., functions and processes);
* from individual autonomy to assigned accountability which represents a shift of emphasis in an organizational recordkeeping culture;
* from record management to recordkeeping;
* from a de-emphasis on applications (i.e., functions and processes) to the creation of customized icons that represent an individual's business processes.

They concluded that for an organization to incorporate corporate memory management considerations into an information office system, it would need to:

* develop a policy that provides a consistent view of what is and is not a record, and a consistent view of what is and what is not an electronic record;
* develop a series of statements that establish the requirements for the ongoing availability, understandability, and usability of records and assign appropriate responsibility throughout the organization;
* develop "rules of the road" to help users manage information from a corporate view;
* develop "a clear understanding of how the office works and how the uses of office systems evolve in order to set the policy and 'rules of the road' in context;"
* progress beyond automating individual tasks toward automating complete functions.

Evolving beyond task automation to the automation of functions will require a new vision which incorporates a clear view of how records management and archives should progress, one that places present practices in their proper context. It will require strategies that include the development of relevant policies, standards, and practices to ensure that the vision is attained. It will also depend upon records management being reinvented and viewed as a daily activity that is part of every organizational member's work and responsibilities. Carrying out these strategies will require a greater understanding of the parent organization's corporate culture and the strategic positioning of record managers and archivists to facilitate the management of electronic records.

To provide insights into his vision of the future, McDonald presented two slides: one titled the present and the other titled the future. The "present" contained a representation of a typical Windows interface with software application icons such as word processing, e-mail, spreadsheets.

The "future" contained icons that represented business applications such as "Operational", "Related Operational", "Program Support", and "Administration".

The icons in the second slide provide access to an individual's main work functions and activities. McDonald explained that a manager's world is organized according to the functions and activities that she/he is involved in. Computer screens should be organized in a manner consistent with this view of this world. The second layer below these functional requirements would contain utilities (i.e., word processing, spreadsheet, e-mail/communications, routing, tracking, project management, recordkeeping) for creating and managing documents within specific domains. These utilities would be linked to rules such as the control of the disposition or retention of records.

To achieve this new interface will require the mapping out of corporate information processes. It will be based on a shared corporate information model which would provide for idiosyncratic process user views. The corporate view would lie invisibly resident over the user views. It would also make each user's view directly related to the types of work in which they actually engage. Furthermore, it would assist employees, archivists, and records managers to view the world in terms of the major functions and activities of an organization.

This system would require an information locator system embedded in the "Administration" functional icon that allows users to cross organizational boundaries in their searches. Metadata and metadata systems (for data, records, text, etc.) would fit behind these functional icons. The actual logistics of this metadata system still needs fleshing out.

McDonald concluded his presentation with the following three questions:

(1.) Is the image of the future, as described, here accurate?

(2.) Is the image of the present, as described, here accurate?

(3.) Are the current strategies appropriate and effective?

Corporate Memory Management

The participants were divided into three groups. Each had to consider one of the following questions:

(1.) What appraisal, acquisition, and preservation strategies should be developed?

(2.) With whom should archives partner?

(3.) What role should archives play in the automation of work flow (or should they focus solely on recordkeeping requirements)?

Group Discussions

During the discussion that ensued in the break-out groups, Terry Cook suggested that there seems to be a consensus emerging that there should be a focus on functions and processes. But Margaret Hedstrom pointed out that the focus was based on very formalized functional responsibilities existing and asked the question "How will these fit with the new focus on small cooperative work groups with multi-functions and low-level decisionmaking capabilities?

Laura McGee expressed concern that organizations do not view recordkeeping as important and asked the question, "How can we better educate management on these issues?"

Hedstrom suggested that we should emphasize that we are in the continuity and institutional memory business and not only in the recordkeeping business.

In another group the question was asked, "Should archives try to generate revenue so we can pay our own way?" There was no agreement on the answer. It was, however, pointed out that people trust archivists more than they trust records managers because archives have a better image. It was further noted that archivists need to build up their credibility and trust within the departments they liaison with. They must be seen as facilitators, rather than regulators. They must let departments take responsibility for their own records and work within their existing corporate culture rather than trying to change it. Archivists must become record managers. They must demonstrate professional amphibiousness.

The third group posited that a functional approach will yield some of the strategies for mitigating the problems associated with e-mail and GIS. It was suggested that archivists and records managers need to form partnerships with regulatory and audit people. They should find mentors who have already done this. Although we cannot influence the marketplace, we can develop models to frame software so that they meet the functional requirements. We could intentionally get sued and then use the resulting trauma to alter people's behavior.

Ad-Hoc Breakout Groups

After dinner, five small breakout groups met to informally discuss specific concerns and ongoing initiatives, including the Swiss Archives electronic document subject classification, NARA's proposed guidelines for e-mail, Developing a Research Agenda, Open System Environment and Data Process models, Government Information Locator Services, and a second

discussion of the PIVOT project (see page 319). Some of these sessions included short presentations, while in others a general discussion ensued.

Swiss Archives Electronic Document Subject Classification

Nicklaus Butikofer gave a progress report about ongoing work in Switzerland to manage their electronic records. He described the Swiss archives electronic document subject classification registration system software (GEVER) which collects metadata at several hierarchical layers. The hierarchies in the filing system are: Subject; File or Dossier; Activity; Task; and Document, or Transaction. Each of these entities has associated with it several attributes. For example, the Document entity possesses the following metadata attributes: classification number, date of registration, date of document, sender/author, addressee, subject heading, circulation, and note. The record creator works through this hierarchy in order to create a document. This process ensures that appropriate contextual and descriptive metadata gets attached to all records.

The metadata model for the subject classification system reflects the functions of the agency and is based on the classification scheme used in Switzerland for centuries. Butikofer said that they have identified thousands of functions that have been incorporated into the top level subject classification entity.

This model has been applied to word processing, image systems, and workflow software, although they have not yet applied it to e-mail. The system does not automatically assign any attributes; rather, the user must manually enter the appropriate information at each level in the hierarchy for every created document. There is, for example, no automatic entry of a user identification or date/time stamping for either creating or viewing documents. The manual nature of this process led several attendees, notably Dagmar Parer from Australia and Liisa Fagerlund of the United Nations, to comment that they could never get their users to cooperate with a manual registry system. Butikofer replied that the Swiss were able to implement this system with success and that problems with compliance were not noticeable. David Thomas, referring to David Bearman's article "Diplomatics, Weberian Bureaucracy,and the Management of Electronic Records in Europe and America," noted that there appeared to be a difference of expectations between the two groups that was based on cultural differences. The culture of recordkeeping in Switzerland enables such a manual system to work while it would likely not work in other cultures such as that found in the United States. While some commentators disagreed, it is precisely a cultural gulf that caused such wariness over Butikofer's approach.

U.S. National Archives and Records Administration Proposed Guidelines for Electronic For Electronic Mail Systems

The 24 March 1994 edition of the U.S. *Federal Register* (vol. 59, no. 57, pp. 13906-13910) contained a set of guidelines, proposed by the U.S. National

Archives, for managing electronic mail systems across the government. These guidelines were promulgated as a result of a series of court rulings which found that the government's electronic mail management policy for both the White House and National Security Council were inadequate. (This episode is commonly known as the "Profs Case".)

Review of the proposal left some uneasy, especially the belief that the guidelines created an entirely new category of record: the "preserved" record. The guidelines' reference to "permanent" records had a long precedence, having always been part of the language of the Federal Records Act. "Preserved" record, however, is new, referring to the action of filing a record. Underscoring this concept is that the information making the record is appropriate for preservation.

The guidelines define a Preserved Record as:

> Documentary materials that have been deliberately filed, stored, or otherwise systematically maintained as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of the data in them. This applies to documentary materials in a file or other storage system, including electronic files and systems, and those temporarily removed from the files or other storage system.

The consequence of accepting the premise of "preserved" records is found towards the end of the guidelines:

> 12A. Records on the E-Mail System:
>
> If an agency has an e-mail system that is designed for or is adaptable for use as an agency recordkeeping system as well as a communication system, users must be instructed on the required steps to be taken to ensure that the record on the user's screen or in his or her mailbox is forwarded to the recordkeeping feature of the system. If, on the other hand, an agency has an e-mail system that cannot also serve as a recordkeeping system, users should be instructed to forward all records from the e-mail system to an appropriate recordkeeping system to ensure that the records are preserved and the e-mail system continues to operate efficiently. When the necessary steps have been taken to preserve the record by using the recordkeeping feature or by forwarding it to an appropriate recordkeeping system, the identical version that remain's on the users screen or in the user's mailbox has no continuing value to the agency of for future research. Therefore, NARA considers the version of the record on the "live" e-mail system appropriate for deletion after it has been preserved on a recordkeeping system along with all the appropriate transmission data. NARA will revise General Records Schedule 23 to authorize deletion of the copy of the record on the "live" e-mail system after the necessary preservation steps have been taken. This general authorization will apply only to the e-mail record on the "live" e-mail system. There is no formal

authorization at this time for agencies to delete e-mail records from the e-mail system if they are stored only on the system itself or if they have been transferred to an electronic recordkeeping system. The revised General Records Schedule will extend the authorization to these categories of records.

This assumption drew the objection of several attendees, one of whom pointed out that this procedure treats electronic mail systems as "mail cubby-hole systems."

It was felt that such characteristics focused the guidelines' efforts on the software application rather than upon the business application which generated the record. The need to focus on business process over software application was one of the points of consensus which emerged during the conference.

Another point of contention regarded the guidelines' recommendations for the disposition of electronic mail records -- "e-mail records may not be deleted or otherwise disposed of without prior disposition authority from NARA." This view was challenged by those who felt that such language assented to treating electronic mail records as though they represented a particular type of document form which can be uniformly appraised. This was found troubling since the guidelines considered electronic calendars to be part of the electronic mail system. Others pointed out that basic electronic mail features, such as File Transfer Protocol, can be used to transfer any form of document from one system to another, hence the homogenous character of electronic mail suggested by the guidelines is misplaced.

In closing, several attendees encouraged those who agreed with the objections highlighted during the discussion to submit their opinions in writing to the National Archives before the comment period closed.

NHPRC Electronic Records Research Agenda

A small group met at the end of the day to discuss possible future directions for the National Historical Publications and Records Commission's Research Agenda. There were no formal papers or presentations but the group started with the question: What structure is needed to move the research agenda forward?

Lisa Weber (NHPRC) explained that the Commission's role was one of facilitator rather than instigator.

The group was divided over the funding priorities of NHPRC. Some expressed the apprehension that archivists addressing electronic records issues were an elite group who have acquired information concerning electronic records to help themselves but have not disseminated this information to a wider audience. Archivists need to educate resource allocators such as city managers and state administrators about problems of electronic records. The profession should bring together teams of people including

archives staff and information management personnel to resolve electronic recordkeeping problems. It was suggested that archivists who dealt with electronic records should write articles for journals that city managers and state administrators read.

Laura McGee (City of Dallas) pointed out that archivists required practical solutions to the problems they face. She stated that staff in the regions desperately needed education in the management of electronic records programs. Archivists, she suggested, were very interested in initiating programs but they were hampered by the lack of adequate education. It was pointed out that there were many different opportunities to fund educational programs on electronic records and that the Research Agenda was to fund research projects.

Ed Bridges (Alabama State Archives) suggested that the University of Pittsburgh's Institute on Electronic Records and Strategic Planning for Chief Administrations of State Government Archives, also known as "Camp Pitt," provided a forum that brought together individuals and helped educate archivists about electronic records issues. There was some disagreement on Camp Pitt's original objectives and its success in fulfilling its role. A discussion on the merits of Camp Pitt ensued but there was no general resolution.

OSE And Data Process Models - *David Bearman*

Bearman's breakout, held at the very end of the conference's second day, briefly examined how different layers and points (electronic "switches") within the Open Systems Environment model could be exploited to satisfy functional requirements for recordkeeping. Electronic switches are points along the hardware and software network infrastructure over which electronic data travel -- such as the interface between a personal computer and the local area network it is connected to (See Figure 1 on page .) Bearman came to this conceptual plan after attending a conference on Computer-aided Acquisition and Logistic Support (CALS) in 1988.

Bearman called for the development of intelligent, object-oriented, user interfaces which would automatically "launch" a software application based upon the business process initiated by a user. Residing invisibly underneath the user interface would be an articulated organizational requirements model which would link to specific software applications. The main shift over current practices is to have a software application launch itself based upon the business function being performed, rather than relying upon the user to call up a software application in order to perform a business function.

For example, a user would start typing a letter at his or her workstation. In response, the intelligent system would automatically recognize that a letter was being typed and act accordingly (by pulling up a word processing package.) Furthermore, as the user keys in the name of the addressee, the system would automatically look up that name in a database and fill out the rest of the recipient's address information.

Bearman asserted that in order for such a model to work, archivists and records managers must marry the organizational business process model with the data object created by organizational members as they carry out their daily tasks.

Instead of having the user fill out a lengthy document profile, the system can be modelled so that much of this information is automatically captured or built in (thus making the users work that much easier). Equally important, such a systems architecture would provide the records staff with exactly the type of information they require for their work. The functional requirements for recordkeeping and the metadata specifications necessary to satisfy them are directly built into the system itself.

For instance, for the process of "issuing a directive" in the federal government, the system would automatically send it to all appropriate recipients, automatically send a copy to the Federal Register which requires reporting of such records, automatically send reply notes when the directive was opened by the addressees, etc.

The above action would, of course, be sent through an electronic mail system, but, the electronic mail software interface would be transparent to the user who is creating a particular document form, a directive. The system functionality is tied to the business process being conducted and not to the software application that the user needs to launch in order to get the message (directive), sent to the desired recipients.

Bearman suggested that tools, such as checklist processors, could be utilized to take textual organizational descriptions and convert them into a workflow model based on the business processes of the organization. Once such a model was developed, it could be used to structure hardware and software configurations for the organization which would satisfy the functional requirements for recordkeeping.

April 10

Making Electronic Records Programs Work: Program Strategies and Reinventing Archives - *Margaret Hedstrom, New York State Archives and Records Administration*

On the morning of the final day, Margaret Hedstrom, from the New York State Archives and Records Administration (SARA), led the participants through a visionary tour of new strategies and tactics that could be employed to "reinvent archives." Based on the emerging paradigm championed by the best seller **Reinventing Government**,[4] Hedstrom called upon the profession to adopt new styles of thinking, arguing that in this time of reengineering and downsizing it is essential that the profession demonstrate renewed relevancy and utility to parent organizations.

Hedstrom articulated four specific reasons why there is a need to reinvent archives now. First, our services are not aligned with the demands of our customers (be they policymakers, agency recordkeepers, or researchers):

* First, we are remiss in providing sound practices and procedures for managing live electronic information systems.
* Second, due to this policy and implementation vacuum, information technology professionals have out-competed archivists and records managers and have cultivated higher degrees of credibility for dealing with organizational electronic information systems.
* Third, the window of opportunity is wide open. Organizations have not fully grasped the challenges and consequences presented by computerized recordkeeping, nor found suitable means by which to manage hardware and software platforms over time. Fourth, this opening provides prime opportunity for archivists and records managers to develop implementation strategies for managing electronic records, ensuring that records are available, understandable, and usable.

To grab this opportunity, dramatic improvements are needed in cost, speed, and quality of service delivery.

To get from here to there, however, requires openness to radical "outside of the box" thinking, such as:

(1.) Becoming more responsive and aware of our customers' needs, be they agency information managers, recordscreators, or records users.

(2.) Becoming outcome-oriented instead of process-oriented.

(3.) Steering rather than rowing. Providing guidelines, oversight, and expertise so that organizational members can manage their own records, rather than ourselves trying to individually manage these records after the fact.

(4.) Becoming requirement driven. Demonstrating responsiveness and relevance to the organization by ensuring external laws and regulations are known and satisfied.

Archival and records management programs should also commit to being innovative, flexible, and enterprising. For Hedstrom it came as no surprise that it is archivists and records managers working within highly computerized organizations who are the first to come to the reinventing concept. Electronic information technology has powerfully challenged many of our standard operating procedures.

4 David Osborne and Ted Gaebler, **Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector** (New York: Penguin, 1992).

To underscore these views, Hedstrom presented a case study taken from New York State's Building Partnerships Project. Initiated in 1992, this two-year project has been designed to "[d]evelop the framework for a comprehensive electronic records program that integrates electronic recordkeeping and archival requirements into the mainstream of agency information management practices."

Building Partnerships evolved from a context that dates to the 1970s when the problems associated with machine-readable records were first felt. From 1985 to 1987, the Special Media Project represented the first sustained attempt to assess the use of computers throughout state government, addressing such basic questions as how many electronic records are there? The years 1987 to 1990 were encompassed by the Strategic Planning Project. Here, the move was made to integrate electronic records management with other formats instead of treating them as a separate issue. The merger of the records management function into the state archives in 1987 greatly complicated this task, as the archives became overwhelmed by the massive responsibilities associated with records management. As a consequence, electronic records were largely neglected during this period. The year of 1990 saw the establishment of SARA's Center for Electronic Records and a recommitment to tackling electronic information systems in a systematic manner.

Over the years it became apparent that there was no "magic bullet" for managing electronic records (remaining unclear to this day is how to integrate electronic records with other media). In light of this complexity, SARA has pursued its work by being innovative and by seizing opportunities as they presented themselves.

Through the Building Partnerships Project, the Center for Electronic Records has "conducted an extensive survey of the policies, practices, and tools that New York State agencies use to identify, control, access, disseminate, and preserve their electronic records." Working hypotheses of the project include the beliefs that:

* it is possible to integrate electronic records management into information resources management;
* there is a need for a government-wide policy on the value of records for operational purposes and accountability;
* some effective practices already exist in agencies (the goal then being to identify, evaluate, and build on them); and
* that archives and records management requirements are not coordinated within existing systems and methods.

An analysis of the problems and limitations of the existing regulatory framework within which SARA has to operate led to the conclusion that archivists and records managers must turn away from forcing agency compliance with regulations and focus instead on helping agencies to satisfy their own recordkeeping needs. The analysis also found that separate actions were required for critical activities such as inventorying and scheduling. Other findings concluded that agencies were unable to identify their own recordkeeping requirements; that recordkeeping and retention requirements were not clearly linked to business functions; that electronic information systems were not necessarily recordkeeping systems; and that there is a general absence of tools, guidelines, and standards for electronic records management.

In the information management and policy arena, Building Partnerships pointed to the opportunity of uncovering examples of "best practices" within agencies. SARA found that, across the government, two out of every three agencies maintained useful metadata about their data. They did so in order to help themselves meet their goals and satisfy their missions. It was also found that some agencies do indeed distinguish between recordkeeping and non-record producing electronic systems, and that some agencies require disposition plans for new applications.

However, other observations in the agency information management policies and practices area found that, generally, policy was oriented towards information technology and not towards information management. It was also discovered that the policy framework fell short on such technology-influenced issues as decentralization, application diversification, office systems automation, and end use.

Drawing from a case study of vital medical records, Hedstrom outlined a series of incentives for recordkeeping that archivists and records managers could promote in order to develop and sustain a receptive audience within their parent organizations. These include:

* The identification of clear legal requirement and programmatic need(s) for particular types of recordkeeping.
* The identification of outside interest in access to particular records.
* The identification of the degree of risk associated with not maintaining certain types of records.
* The identification of the degree of visibility associated with a particular agency function, and, consequently, the importance of documenting such functions through comprehensive recordkeeping.
* The identification of the culture of stewardship and the culture of recordkeeping already present in an agency and assessing how they can be harnessed to satisfy recordkeeping requirements.

SARA's current program goals for electronic records management include cultivating partnerships with agencies to carry out records management programs that support effective program management and public

service delivery. This, however, has been found to be rather difficult to demonstrate in concrete terms. Other goals are to promote economical and efficient management of information resources and to ensure that archival records are produced and, when appropriate, transferred to archives.

The Building Partnerships project maintains several proposed outcomes. Ideally, agencies would come to create and maintain adequate, reliable, purposeful, and usable records over the normal course of their business. Such records would be identified and protected so that they remained accessible for as long as they were needed by the government or by the public. More government officials would come to have a wider appreciation of the functions that records play in their operations and would seek to implement sound records management practices. Ideally, such practices would be developed in consultation with SARA.

Key desired changes within the state government would witness electronic records management integrated into the normal course of business, as opposed to remaining a separate program function. Agencies would come to see the value of records as organizational assets and no distinction would be made between records and archives. There would be a shift away from regulatory oversight and towards facilitation and service delivery. Economy and efficiency would be eliminated as a primary outcome for archives and records management programs. In its place, records programs would focus on demonstrating the impact on management and service delivery goals that would be produced by sound electronic records management.

Beyond the Building Partnerships project, Hedstrom elucidated the features that would characterize a reinvented archives and records management program. They would be anchored within the existing regulatory regime and based on the primary notion of accountability to society. Effectiveness of regulations would be contingent upon identifying compelling social needs for them. Responsibility for the records management function would be assigned to agency heads who would be required to report on their activities to a formal oversight board. This board would judge agency programs on the basis of their recordkeeping outcomes and the degree to which agency recordkeeping is linked to agency business functions and accountability requirements. Hedstrom argued that success on these measures would rely on archivists and records managers to change their approaches to their authority and mandate. Foremost would be the requirement to link recordkeeping to agency accountability and business. A key question here would be whether to promulgate separate records laws and policies or to integrate these into broader laws and policies? In either case, it would be necessary to link agency enforcement and compliance within the existing monitoring framework -- through audits, for example. Hedstrom stated that the records professions could realign themselves either by seizing the opportunities provided by visible scandals involving improper recordkeeping actions (such as unlawful destruction) or by assuming that they have certain operational authorities and discharging them.

Reinvented service delivery would also advance the records professions. Here, archivists and records managers would focus on such things as providing a consistent message, and point to the fact that they are part of larger accountability and continuity contexts. They would provide multiple service points which could rapidly respond to agency and other user needs by providing relevant and useful information. Within the agencies themselves, archivists and records managers could reward and promote "best practices," acknowledging that there are multiple strategies acceptable for accomplishing sound recordkeeping and for solving records challenges.

Reinvention also requires that the archives and records management professions clearly articulate those services that it can provide. Among the more salient are elucidating the meaning of a record and defining its attributes, promoting how recordkeeping supports accountability and continuity, expanding recognition that the records and archives lineage is critical to accomplishing organizational missions.

Given the constant alterations in organizational membership and activity, archivists and records managers will have to continually take the pulse of their organizations and repackage the content, not the intent, of their message. The audiences for such a message are found both within and outside parent organizations -- students in archives and records management programs, practicing archivists and records managers, related information professionals, records creators, policymakers, researchers, even the public. These messages could be transmitted through a variety of means -- formal education, training, and by pointing to stimulating or provocative examples drawn from society.

Hedstrom closed her presentation by pointing out issues that still need to be addressed before archives and records management programs can be truly reinvented. Included were the degree of responsiveness required, the need for tools (such as for managing electronic mail), the need to anticipate changes in order to respond to them in a timely manner, the need to develop greater familiarity with computer technology, and the methods to get agencies to comply with recordkeeping requirements. She also broached the subject of whether records management is a separate business function or whether it is really a part of all business processes. If it is, then how would archives fit in?

Reinventing Archives

Hedstrom then divided the attendees into three groups and asked each to consider one of the following questions:

> (1.) What would a new regulatory regime look like for achieving desired outcomes for archival and records management programs?

(2.) What tools could archivists and records administrators provide to help achieve desired outcomes?

(3.) What would archivists and records managers teach about why and how to achieve the right outcomes for archival and records programs? Who would we teach?

Suggestions by each of these three groups have been incorporated into the discussions above. John McDonald of the National Archives of Canada reported on the findings of the group which addressed the regulatory regime. His report focused on questions of accountability, eliciting a compelling social value against records destruction/removal into a compelling social need, the assignment of recordkeeping responsibility to organizational managers, and the linking of recordkeeping activities to organizational functions. Another suggestion was to review a prior major transformation in bureaucratic power and norms, such as sexual discrimination, in order to analyze how it came about and what lessons it could impart for designing strategies to enhance archives and records management.

Liisa Fagerlund of the United Nations spoke for the group tasked with examining tools and outcomes. This group felt that the creation of educational training tools such as workshops, publications, and self-teaching kits held some promise. It also believed that archivists and records managers needed to develop better marketing, facilitation, and change management skills. Also needed were more sophisticated political activity through alignment-building, strategic use of external pressures, and obtaining grants to conduct internal research. This group saw great value in developing specifications for recordkeeping requirements and called for embracing locator systems to manage recordkeeping systems. Others in the group pointed out the need to develop a hypermedia compendium of best practices within the profession. Finally, it was deemed essential to participate in inter- and intra-professional exchange programs which would report on successful projects that could inform other contexts.

Richard J. Cox of the University of Pittsburgh provided the group report on education. He touched upon the need to identify appropriate audiences, such as students, records professionals, allied information professionals, records creators, policymakers, and researchers. Cox also noted that it is the archives and records management professions themselves which have to define records and point to the roles they can play in accountability, continuity, and utility. It was suggested that a more overt use of the media could reap substantial benefits.

In closing, Hedstrom pushed the attendees to move from thought to action and not let the fear of failure instill paralysis.

A Research Agenda for Electronic Records Management - *Lisa Weber, National Historical Publications and Records Commission*

Lisa Weber's presentation was divided into four parts: the development of the National Historical Publications and Records Commission's (NHPRC) electronic records research agenda; a review of the ten questions identified by the research agenda; a discussion of several of the projects NHPRC has funded related to its agenda; and an examination of questions and topics raised during the meeting and how they fit into the agenda. The research questions the agenda asked are:

(1.) What functions and data are required to manage electronic records in accord with archival requirements? Do data requirements and functions vary for different types of automated applications?

(2.) What are the technological, conceptual, and economic implications of capturing and retaining data, descriptive information, and contextual information in electronic form from a variety of applications?

(3.) How can software-dependent data objects be retained for future use?

(4.) How can data dictionaries, information resource directory systems, and other metadata systems be used to support electronic records management and archival requirements?

(5.) What archival requirements have been addressed in major systems development projects and why?

(6.) What policies best address archival concerns for the identification, retention, preservation, and research use of electronic records?

(7.) What functions and activities should be present in electronic records programs and how should they be evaluated?

(8.) What incentives can contribute to creator and user support for electronic records management concerns?

(9.) What barriers have prevented archivists from developing and implementing archival electronic records programs?

(10.) What do archivists need to know about electronic records?

During the course of the meeting, a number of research-oriented questions emerged, but most of them could be fit into the current NHPRC research agenda. For example, in Rick Barry's presentation, he raised the question, "does the business function of an organization have an impact on its recordkeeping?" Or put another way, "does the degree of risk of not satisfying each of the recordkeeping functional requirements differ among business functions?" Weber explained that this question could be addressed

in questions five and eight of NHPRC's research agenda. Another question raised by Barry was, "in terms of an organization, where does archives and records management belong?" She pointged out that this question could be addressed in question seven of the agenda.

Weber suggested that Liisa Fagerlund's presentation raised a research issue that wasn't included in the agenda. This was the topic of transition. The specific question was "how can archivists address the transitional period from paper-based systems to electronic recordkeeping systems?"

During the discussion that followed, several other research topics emerged. These included the need to understand the emerging network environments as drivers for organizational change and the need for a better understanding of the user.

Weber concluded that none of the ten questions have been adequately answered and there are obviously more questions to add. Although there are no current plans to revise NHPRC's agenda, that remains a possibility.

Closing Remarks and Summation - *David Bearman, Archives & Museum Informatics*

Bearman reminded the participants that the goal of the meeting had not been to arrive at conclusions, but rather to explore the rapid development of ideas across the globe over the last 18 months. Nevertheless, he pointed out, this period has witnessed independent convergence on a few themes which lead to conclusions including:

(1.) The realization that there is an electronic "record" and that we have to be specific in our definition in order to identify it, protect it, and attach to it appropriate metadata for its management.

(2.) There is a new grounding for the archival discipline in the functional requirements for recordkeeping which come from society and have broad social warrant. Therefore we can take this warrant to provide archives and records management with an enhanced profile, increased relevance, and utility to society.

(3.) Modern organizations are changing and operating in different ways. By shifting our focus from structure to functions and processes, we can contribute to re-engineering and document records across time.

(4.) Archivists should think about and document transactions.

(5.) We need tools to think better about functions. We need analytical frameworks, specific to the archival discipline and knowledge representation approaches that allow us to link functions to transactions to records.

CONTRIBUTORS

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