Shorter Features

MAYGENE DANIELS, *Editor*

The Shorter Features department serves as a forum for sharply focused archival topics that may not require full-length articles. The department also may include articles about archivists' experiences implementing archival programs of particular interest within specific institutional settings. Members of the Society and others knowledgeable in areas of archival interest are encouraged to submit papers for consideration. Papers should be sent to Managing Editor, *American Archivist*, Society of American Archivists, 600 S. Federal, Suite 504, Chicago IL 60605.

MARC and Life Cycle Tracking at the National Archives: Project Final Report

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DURING AN EIGHTEEN-MONTH PERIOD between July 1984 and January 1986, the National Archives and Records Administration (NARA) investigated the potential impact of two major automation issues on NARA systems and procedures. One concern was the implications of developing an automated system for tracking federal records through their life cycle. The second centered on the possible uses within NARA of the newly emerging information exchange format known as the MARC AMC (Machine Readable Cataloging Archival and Manuscripts Control).

These two automation issues, although different, emerged at the same time, and their examination required similar information-gathering and analytical processes. Therefore, their evaluations were combined into one project, which was conducted by the Archival Research and Evaluation Staff.[1]

To "test" the MARC AMC, the National Archives needed access to a system that incorporated the format. The vehicle chosen was the Research Libraries Information Network (RLIN), a data base and resource sharing tool supported by the Research Libraries Group. RLIN was

[1]This staff was created in 1983 to investigate the application of new technologies to archival activity as a way of improving efficiency and productivity in NARA. The evaluation of both life cycle tracking and the MARC AMC fit within the mandate of the Archival Research and Evaluation Staff.

selected because it had a working implementation of the MARC AMC, had sufficient system capacity to meet project needs, and would permit NARA experimentation with the RLIN data base. Since the RLIN system would be fully tested in the course of the project, an evaluation of RLIN as a tool for NARA ultimately became a project goal.

The goals of the MARC/Life Cycle Tracking Project, then, were threefold. The project staff consistently sought to determine (1) the implications of developing an automated system for controlling federal records throughout their life cycle; (2) the full capacity of the MARC AMC format to carry information for both the control of and access to federal records throughout their life cycle; and (3) the usefulness of the RLIN-supported MARC AMC to meet the access and control needs of NARA.

To begin the project, the staff identified the most important NARA forms and their data elements. These included the standard forms used for the scheduling of records, transfer of files to the records center, and offer of permanent records to the National Archives. In addition, the individual data elements on these and several other forms were compiled, analyzed, and compared for uniformity.

The staff prepared charts, called "process flow diagrams," that indicated the typical linear progression of information and actions leading to the approval of a records schedule, accessioning of records into the National Archives, or description of permanent records. The diagrams, in conjunction with the analysis of forms and data elements, provided staff with an understanding of how major archival processes were conducted within the National Archives and the type of information that routinely moves from one office to another.

To condense a process that normally spans years, the entry of complete sequences of life cycle actions into the network's data base was accomplished primarily through retrospective modeling. This technique involved taking a body of records and, using existing forms and documentation, re-creating all actions and processes that had affected the records. The re-creation resulted in placing descriptions of the contents of records and the actions taken on them into the RLIN data base. Eventually over 1500 MARC records, describing NARA holdings primarily at the series level or above, were entered into the RLIN network.

In addition, over a dozen NARA archivists were trained in the use of the RLIN system. Seven RLIN terminals were purchased, five of which were placed in offices responsible for carrying out actions during different phases of the life cycle. Archivists handling appraisal, arrangement and description, reference, and record center activities entered archival information that their units generated or used. This exercise helped to broaden participation beyond the immediate project staff.

By the late fall of 1985, the information-gathering and testing phases had ended, and evaluation of the collected data began. This effort resulted in a final report covering methodology, findings, and recommendations. The report was presented to the Archivist in February of 1986. Over 200 pages in length, the final report contains extensive appendices including process flow diagrams, sets of major forms, and analyses of data elements.[2] The major findings and recommendations, however,

[2]To obtain a copy of the final report from the MARC/Life Cycle Tracking Project, send a written request to: MARC/LCT Project, Archival Research and Evaluation Staff, National Archives and Records Administration, Washington, D.C., 20408. Copies of the report are available to institutions.

can be summarized as follows.

Life Cycle Tracking

A life cycle tracking (LCT) system would permit unprecedented access to information about the status and content of federal records and would enhance NARA's ability to perform both its archival and records management missions. It would enable NARA to develop an audit trail of all actions taken upon particular series or types of records regardless of custodianship at various phases of the life cycle. In addition, an LCT system could provide, upon demand, information that today must be culled from paper-based files, a procedure so cumbersome that information retrieval is difficult and statistical analysis a virtual impossibility. In short, an LCT system would provide information about the content of records, information about actions taken upon records, and information necessary for proper management and control of records. The project staff strongly recommends that the National Archives proceed with the development of a life cycle tracking system.

Nevertheless, there are difficulties that must be overcome in order to realize the goal of establishing an automated LCT system. The most difficult obstacle to surmount is the lack of consistency, uniformity, or standardization in the ways in which federal agencies, or for that matter, different NARA offices collect or develop information about records. Each NARA office has developed systems or procedures with little consideration for the interdependence of processing or the agency-wide flow of information.

While the life cycle tracking system need not be a single data base, it is imperative that if distributed or multiple systems are used, compatibility of data elements between systems or data bases be maintained. This can be accomplished by assuring that any information used by more than one office fits into defined fields, shares common data element definitions, and is subject to controlled vocabulary. In addition, the information should be transmitted through a standard exchange format. Achieving this level of compatibility will involve a major exercise in intraorganizational cooperation, but once accomplished it will give the National Archives the compatibility and flexibility needed to maximize existing resources.

MARC AMC Format

The project staff tested the MARC AMC's ability to handle the range of National Archives and Records Administration descriptions as well as various types of process control information. Description was defined to include identifying information about records at any stage in the life cycle. Description is, therefore, the heart of all archival activity from appraisal through records center storage to reference service on accessioned permanent records.

Experimentation with MARC AMC has led to a number of conclusions. The format can hold descriptive information across the entire range of life cycle stages. MARC fields are compatible with most of the data elements inherent in NARA and agency-produced descriptions of records. Data elements for which there are no defined fields (such as information needed to represent the administrative hierarchy within the National Archives) can be accommodated through the use of "local fields," which allow institutions to place local information in the format in whatever manner suits them.

The manipulation and arrangement of National Archives information in MARC records, however, presents problems. Common information structures such as disposition schedules and inventories cannot be produced without building into

the system a capability for arranging and displaying MARC records in a specified order. As currently defined, MARC fields do not allow for the display of records in a specific order. For example, there is no means to ensure that the description of a series and the description of its index are displayed sequentially as the result of a search.

In addition to weakness in handling National Archives information structures, the process control functions in MARC AMC, while sufficient to meet the needs of smaller repositories, are not sophisticated enough to handle easily the complex and multiple needs of NARA. The use of a generic action field to record all types of action requires extra input to name and identify each action, thus increasing the amount of data entry and the likelihood of errors. Furthermore, the absence of specifically defined quantity measurements in relation to specific actions makes the process of compiling statistics and producing administrative reports cumbersome if not impossible. The staff therefore concluded that the National Archives should not attempt to handle process control information on MARC records.

Even though description fits reasonably well into MARC AMC, problems may still arise. The external standards commonly used with the MARC AMC—namely, *Anglo-American Cataloguing Rules*, 2d. ed. (AACR2), name authorities, and Library of Congress subject headings (LCSH)—at first will seem awkward and burdensome to many archivists. Because of the variety of descriptive practices used in the past in the National Archives, however, many of the difficulties encountered in a conversion to MARC and associated standards would occur with the implementation of any automated system using numerous well-defined fields. Given this, the project staff believes that the benefits in the long run of assuring conformity of description to MARC and associated standards outweigh the disadvantages of converting to the format.

On balance, project staff concluded that NARA should define the data elements in emerging automated systems in a manner compatible with MARC fields and that automated systems the National Archives establishes in the future should support the creation of MARC records. Underlying these recommendations is the belief that the National Archives has a great deal of information that it will wish to exchange internally, with other federal agencies, other archival repositories, and national bibliographic data bases.

RLIN

The Research Libraries Information Network (RLIN) is a MARC-based centralized data base administered by the Research Libraries Group in Palo Alto, California. RLIN has an important role to play in providing increased access to NARA holdings by the scholarly public and other archival repositories.

Entering NARA information into RLIN is in a sense equivalent to publication. By providing access to descriptive information more quickly and at much less cost than publication, RLIN offers an efficient and economical approach to publicizing NARA holdings to an important audience. In addition, the increasing numbers of archival repositories joining RLIN, including state archives, provide NARA and other archivists with a readily accessible data base for conducting cross-repository and comparative searches.

The project team concluded that RLIN could support many NARA descriptive needs, but not NARA's needs for process control. Even if RLIN moved toward distributed processing (which is likely), the transmission and transaction costs

associated with large volumes of data and the high percentage of administrative information of no interest outside the National Archives are strong arguments against adopting RLIN as the primary automation system supporting NARA process control functions. On balance, the staff recommended that the National Archives join RLIN and transfer descriptive information to the RLIN system from internal systems designed to meet NARA's multiple needs.

In summary, the MARC/Life Cycle Tracking Project concluded that NARA would benefit from greater standardization of description across office lines and agreement upon common data elements for information exchange. The staff believes that the data elements in the MARC AMC format are compatible with NARA information and that future automated systems in each office should be capable of producing MARC records for exchange purposes. One major benefit of standardization would be the opportunity it would give NARA to develop a life cycle tracking system. With a properly structured LCT system, NARA can improve its internal management of archival processes, produce needed reports and statistics, and provide a broadly based constituency with information about the status, location, and content of federal records.

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The MIT Appraisal Project and Its Broader Applications

JOAN K. HAAS, HELEN WILLA SAMUELS, *and* BARBARA TRIPPEL SIMMONS

In 1983 the Institute Archives of the Massachusetts Institute of Technology (MIT) initiated an appraisal study of the records of modern science and technology. The immediate stimulus for the project came from within the Archives, where collecting and processing were hampered by an insufficient understanding of scientific and technological documentation on which to base appraisal judgments. Two external influences further prompted the study. The first was the report of the Joint Committee on Archives of Science and Technology, which concluded that archivists' lack of understanding of the records of science and technology and a lack of clear appraisal guidance perpetuated a neglect of this documentation.[1] The second was a professional consensus that appraisal theory and practice should be improved.[2] The Institute Archives viewed the science and technology appraisal project as a case study which would allow the examination of appraisal practice as a whole.[3] The result of the project was the book *Appraising the Records of Modern Science and Technology: A Guide*.[4] The *Guide* can be read two ways: for specific information on appraising science and technology records, and for a general approach to transmitting appraisal information. This article describes the project, discusses its specific findings, and suggests how the *Guide*'s general approach could be applied to other situations.

The project built upon several premises. First, when appraising records, archivists should consider the total body of available documentation, not just the material they are appraising. Archivists should know what offices, institutions, or repositories house related material, and they should appraise in light of this larger universe of documentation. Archivists should also study the relationship among various forms of documentation. The information content of manuscript material, published records, artifacts, and other sources is often interconnected, so appraisal decisions should be made not only with an awareness of the value of each form of documentation, but also with full knowledge of their relationships. A knowledge of the available sources of information and their potential uses allows the archivist to select manuscript and archival records to supplement those sources while avoiding duplication. While locating and studying related documentation may now be difficult, automated records of archival holdings in linked networks will facilitate this coordinated appraisal.

The second premise was that appraisal advice cannot be dogmatic and prescriptive. Uniform appraisal standards should not be formulated because appraisal is a

[1]See *Understanding Progress as Process: Documentation of the History of Post-War Science and Technology in the United States*, Final Report of Joint Committee on Archives of Science and Technology, ed. Clark A. Elliott. Distributed by the Society of American Archivists, 1983.

[2]Cf., Richard C. Berner, *Archival Theory and Practice in the United States: A Historical Analysis* (Seattle: University of Washington Press, 1983), 7.

[3]In 1983 NSF awarded Helen Willa Samuels a two-year research grant to work half-time on issues of appraisal theory and practice. In 1984 the Andrew W. Mellon Foundation provided funding for two full-time archivists, Joan K. Haas and Barbara Trippel Simmons, to research and write the appraisal guide.

[4]Joan K. Haas, Helen Willa Samuels, and Barbara Trippel Simmons, *Appraising the Records of Modern Science and Technology: A Guide* (Cambridge, Mass.: Massachusetts Institute of Technology, 1985). Distributed by the Society of American Archivists.

dynamic process that changes according to the goals, acquisition policy, and financial constraints of each institution. A third and related premise was that appraisal cannot be based on attempts to predict future research trends. Archivists, however, should understand research methods and be aware of past and current research trends. This knowledge, and consultation with creators and users of records, can help archivists make sound appraisal decisions.

Throughout the project the staff studied appraisal practice, dwelling specifically on how archivists make and document appraisal decisions and how they communicate appraisal guidance. In analyzing existing appraisal literature, the staff found that three approaches to appraisal have been used. The first and most prevalent method is to present appraisal information by record type (for example, correspondence, diaries, or logbooks) or record format (for example, moving images, machine-readable records, or audio tapes).[5] The second approach offers appraisal guidance for record types within a specific discipline or enterprise, such as physics or banking.[6] The third incorporates the first two approaches but focuses on a discipline or enterprise through a systematic analysis of how records are created and used. In this approach a particular discipline or enterprise is described, the activities and the records generated by it are discussed, and appraisal considerations are presented.[7]

The *Guide* is organized according to the third approach. For each phase of the scientific and technological process, it provides the following: a description of the activities involved, a description of the documentation generated by or used during those activities, and appraisal considerations. For example, in the section on the funding of science and technology the activities involved such as identifying funding agencies and writing proposals are discussed; the records generated as a result of these activities, such as budgets, contract specifications, and monthly statements, are described; and finally, appraisal considerations are offered for these records.

This framework was chosen for several reasons. First, it allowed an expansion of the traditional archival emphasis on understanding records creation. Although appraisal literature prescribes background research on the office of creation, the administrative histories archivists produce usually emphasize bureaucratic relationships. Background research has not traditionally encompassed a broad understanding of the activities (social and intellectual) through which records are produced, or the concept of devising an appraisal framework based on that understanding. Second,

[5]For example, in Maynard J. Brichford, *Archives and Manuscripts: Appraisal and Accessioning* (Chicago: Society of American Archivists, 1977), the author discusses the standard appraisal principles and appends a table of types of paper records grouped into five categories, according to relative value. For two works approaching appraisal by record format, see Sam Kula, *The Archival Appraisal of Moving Images: A RAMP Study with Guidelines* (Paris: UNESCO, 1983) and Charles Dollar, "Appraising Machine-Readable Records," *American Archivist* 41 (October 1978): 423-30.

[6]See, for example, Philip N. Cronenwett, "Appraisal of Literary Manuscripts," in *Archival Choices: Managing the Historical Record in an Age of Abundance*, ed. Nancy E. Peace (Lexington, Mass.: Lexington Books, 1984), 105-16, and Joan N. Warnow, et al., *A Study of Preservation of Documents at Department of Energy Laboratories* (New York: Center for History of Physics, 1982).

[7]See, for example, Michael Stephen Hindus, Theodore M. Hammett, and Barbara M. Hobson, *The Files of the Massachusetts Superior Court, 1859-1959: An Analysis and a Plan for Action* (Boston: G.K. Hall, 1980); Morris B. Ullman, "The Records of a Statistical Survey," *American Archivist* 5 (January 1942), 28-35; Paul Lewinson, "Towards Accessioning Standards — Research Records," *American Archivist* 23 (July 1960), 297-309; and Patricia Aronsson, "Appraisal of Twentieth-Century Congressional Collections," in *Archival Choices*, 81-104.

this framework deemphasized record format. Record formats change over time, so appraisal based on format is generally not useful. This approach permitted the *Guide* to focus on information regardless of its format. Third, it allowed the staff to develop a systematic method of presenting appraisal guidance that could prove useful as a model for other disciplines and enterprises. Finally, this approach enabled the *Guide* to demystify science and technology by providing archivists with a description of the scientific and technological process. It was hoped that a better understanding of science and technology would encourage archivists to collect these records more actively.

The educational background of the staff members was in the humanities, so to begin the project they had to immerse themselves in the scientific and technological process by reading history, sociology, anthropology, and philosophy of science and technology; by discussing the project with scientists, engineers, and historians of science and technology; and by visiting laboratories to talk with scientists and engineers. To familiarize themselves with records produced by scientific and technological activities, the staff examined files located in laboratories and offices at MIT and other institutions and collections in their own and other repositories. At the same time, they studied past scholarship in the history of science and technology by reading histories; by attending lectures, colloquia, and professional meetings concerned with the history of science and technology; and by interviewing historical researchers about their research methods and findings. The project staff did not attempt to understand the technicalities of specific scientific or technological disciplines; rather, they sought to understand the intent and process of science and technology.

To facilitate the research and writing of the *Guide*, Haas and Simmons conducted independent research on specific activities. In the course of this research, consultation with creators and users of records helped them formulate appraisal guidance. Appraisal examples were then developed to illuminate this advice.

Next, the staff concerned itself with defining the level of specificity of the *Guide*. Should the publication deal separately with each discipline within science and engineering? Should the publication deal with science separately from technology, or could they be treated together? For reasons of expediency, the staff decided to adopt a broad approach, discussing science and technology in general rather than addressing specific disciplines separately. They felt that, if necessary, the publication could be adapted later by archivists or the staffs of discipline history centers to apply more specifically to a particular subject. They also decided to treat science and technology as a unit after discovering that the scientific and technological processes are similar and interdependent in the post-World War II period.

The next problem grappled with was how to structure the publication. The first draft was written from the archivists' point of view and organized according to the series of questions archivists ask themselves about the records they are appraising. Colleagues who reviewed this draft indicated that this was not an effective method of communicating appraisal information. The staff, therefore, revised the *Guide* to provide information based on the sequence of component activities of the scientific and technological process. Because they believed that understanding the activities that lead to the creation of records is the foundation of appraisal, the staff decided that this would be a better means of presenting appraisal information.

To help organize the second draft, the

staff constructed a table of the scientific and technological processes and their records. Divided into three sections, the table consists of a list of the component activities of the scientific process on the left; a parallel list of the component activities of the technological process on the right; and between the two, bringing together the scientific and technological processes, a list of the records that document each activity. Although the table was devised to help the authors organize the second draft, they realized that it would be a useful tool to archivists in appraising and processing. Thus, it became an integral part of the publication.

Throughout the project, colleagues in the archival and allied professions were consulted to ensure that the publication would apply to a wide audience. The staff wanted the *Guide* to be useful not just at institutions like MIT, but also at repositories where scientific and technological activities are not the primary focus of the institution. The second draft was reviewed by archivists, scientists, engineers, librarians, and historical researchers. Reviewers confirmed that the structure paralleling the activities of science and technology was effective. During this final review the *Guide* was tested by the Manuscripts and Archives Department at Yale University Library, where archivists successfully used it to appraise and process scientific and technological collections. All that remained was to refine the final draft and to design a format to enhance the usefulness of the publication.

The *Guide* is being used for many archival activities. Archivists and records managers in a variety of institutional settings are using the *Guide* to determine whether to solicit specific records or schedule them for retention. It is being used to guide the appraisal and processing of scientific and technological records. In addition, archivists are beginning to examine the usefulness of the *Guide* for other disciplines. The National Historical Publications and Records Commission funded a project at the Educational Testing Service to appraise and process the papers of an experimental psychologist and determine if the information in the *Guide* can also be applied to the social sciences.

Unanticipated uses of the *Guide* have also materialized. Several professors of the history of science and technology are planning to use the *Guide* in their history methods courses for the description it provides of the scientific and technological process and its records. The *Guide* has also prompted some librarians and museum curators to rethink the selection of and access to information needed by their constituencies.

Some archival educators are using the *Guide* as part of their appraisal curriculum materials. This use recognizes that the *Guide* offers a general approach to appraisal as well as specific advice on the records of science and technology. The *Guide*'s framework could be used to present appraisal guidance for other areas. Based on an analysis of activities or functions, guides could be written for the records of specific disciplines (for example, archaeology or architecture) or institutions (for example, banks, colleges, or courts).

Transferring this method to other settings would have several benefits. Appraisal guides for the records of a discipline or institution could provide archivists with useful descriptions of the environments they are documenting. An understanding of the activities or functions that produce records would strengthen archivists' understanding of the records they manage and enhance their ability to appraise and process effectively. Finally, the use of a uniform framework for making appraisal decisions would facilitate sharing appraisal

information among repositories.

Appraisal guides for other areas could be written by sections within SAA, by discipline history centers, or by archivists at specialized institutions. All of these groups provide a setting in which archivists and their constituencies can work together to examine appraisal issues. To test this assumption, the Institute Archives at MIT, funded by the Andrew W. Mellon Foundation, will produce an appraisal guide for college and university records using the framework developed for modern scientific and technological records. This project will provide an opportunity to further develop the method used in the *Guide*.

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Thinking Small to Think Big: Archives, Micrographics, and the Life Cycle of Records

GREGORY S. HUNTER

ALL RECORDS GO THROUGH A "LIFE CYCLE": from creation through active use, semi-active use, and ultimate disposition (either archival preservation or destruction). Archivists should become involved with records as early as possible in this life cycle, not only to guarantee the preservation of records of enduring value,[1] but also to offer maximum benefit to their parent institutions. In this regard, micrographics can be a key resource.

Traditionally archivists have microfilmed records for one of two reasons: either to reduce wear-and-tear on fragile originals or as an alternative to photocopying large sections of collections for researchers. While both of these are valid reasons for microfilming, they only involve records at the end of their life cycle. Especially in a small organization or institution in which there may be no records manager, an archivist with a broader view of micrographics can make an important contribution.

Micrographics has a central role because of three functions it can perform. The first, and most typically, archival use is to *supplement* paper; after microfilming, the paper is retained. Secondly, micrographics can *replace* paper, meaning that after filming the paper is destroyed. Most records managers use micrographics in this way. And thirdly, micrographics can *displace* paper, preventing it from ever being generated. Instead, a computer prints its reports directly on Computer Output Microfilm rather than paper.

A broader view of micrographics looks beyond an emphasis on miniaturization to focus on *making people more productive*. This is done by getting the right information in the hands of the right people, at the right time, at the right place, and at the lowest possible cost.[2] The balance of this article will discuss each part of this objective.

The Right Information

To improve the overall productivity of an organization or institution, its members or employees must have the right information—that needed to make a decision or to perform an activity. Using micrographics as a productivity tool means filming records containing such information. Microfilming other kinds of records may save space, but a space-savings approach does not go far enough. The space-savings approach is important and useful because it usually gets microfilm in the door, but it is necessary to go beyond this to realize the full potential of micrographics.

At ITT, we have prepared a fact sheet summarizing the potential of microfilm for making the right information available to a department. In addition to space savings, the fact sheet stresses file integrity, faster access, disaster protection, and low-cost duplication. Clearly, the advantages of microfilm go beyond reduced cubic footage.

[1]In the words of the SAA Goals and Priorities Task Force, "Records and information management is the means by which the archivist intervenes as needed throughout the life cycle of records to ensure the proper management of prospective archival material." *Planning for the Archival Profession: A Report of the SAA Task Force on Goals and Priorities* (Chicago: Society of American Archivists, 1986), 4.

[2]Robert F. Williams, "Electronic Document Management: The Coming Revolution in Records Management," *IMC Journal* 21, no. 4 (Fourth Quarter 1985): 35.

Despite all these advantages, microfilm does no good unless it is used for the *right records*. This is not as simple as it may sound. Many archivists have inherited reels of microfilm that never should have been produced in the first place. The archivist is faced with the difficult decision of whether to retain records of questionable value because they cost so much to produce and take up so little storage space, or to destroy the microfilm once and for all. It is easier not to produce microfilm than to decide to destroy film already produced.

The key element in microfilming the right records is to think of each record series independently. Answering ten basic questions for each series will help clarify the nature of the records and their potential for microfilming. The ten questions are as follows:

1) What is the format of the records? (e.g., bound, unbound, size, color, folded, two-sided)
2) What is the condition of the records? (e.g., fragile, yellowed, brittle, out of order)
3) How long are the records retained?
4) What is the volume of the records?
(5) What is the growth rate of the series per year?
6) Are the records ever updated?
7) Who uses the records?
8) How often do they use them?
9) Are multiple copies required?
10) Are there legal restrictions that would prevent microfilming?

A second aspect of viewing record series independently is to realize that one microform may not solve all records problems. Thirty-five millimeter roll film may be the right answer for old newspapers but wrong for active personnel files. After analyzing each record series, it is necessary to consider which of the following microforms best fits the application:

A. Serialized microforms (sequential access, similar to songs on a cassette tape)
   1. Open rolls (16mm or 35mm)
   2. Closed rolls (cartridges or cassettes)

B. Unitized microforms (access by individual units, similar to tracks on a phonograph record)
   1. Microfiche (a sheet of film with images arranged in a grid pattern)
   2. Microjackets (a plastic carrier with channels for strips of film)
   3. Aperture cards (a tabulating size card usually used for engineering drawings)
   4. Card jackets (an index card with channels for strips of film).

Clearly, in providing the right information, it is important not only to film the right records, but also to use the most appropriate microformat.[3]

The Right People

Information, either on microfilm or in hard copy, must reach the hands of the right people: the ones who need it to make decisions or to perform activities. Micrographics becomes particularly valuable when there is more than one "right" person—when more than one person needs to refer to the information simultaneously or consecutively.

[3]See Wilmer O. Maedke, Mary F. Robek, and Gerald F. Brown, *Information and Records Management* (Beverly Hills: Glencoe Press, 1974), 365-72, 399-412; Irene Place and David J. Hyslop, *Records Management: Controlling Business Information* (Reston, Va.: Reston Publishing, 1982), 282-93; Frederick Klunder, "Using Microfilm," in *Taking Control of Your Records: A Manager's Guide*, ed. Katherine Aschner (White Plains, N.Y.: Knowledge Industry Publications, 1983), 65-75; Susan Z. Diamond, *Records Management: A Practical Guide* (New York: American Management Association, 1983), 127-33, 141-43; C. Peter Waegemann, *Handbook of Records Storage and Space Management* (Westport, Conn.: Greenwood Press, 1983), 71-76; Robert F. Williams, ed., *Legality of Microfilm: Admissibility in Evidence of Microfilm Records* (Chicago: Cohasset Associates, 1980, with updates); and Robert F. Williams, "Card Jackets: The Synergistic Microform," *Journal of Micrographics* 10, no. 1 (September 1976): 41-47.

Micrographics makes duplication of an entire file or series an easy matter. It also accomplishes this duplication at a lower cost per page than photocopying. Because of the low cost of duplication, it is economical to provide new working copies whenever there has been a change in the master copy. An example is the use of Computer Output Microfilm (COM) in an accounting setting. If the general ledger is kept on computer and generated on COM, it is possible to provide a new copy each morning to everyone needing to refer to the file during the day, thereby eliminating waiting lines at the master print-out.[4]

Another example of how micrographics gets information to decision-makers is in the insurance industry. Many large insurance companies use microfilm jacket systems for their active case files. While the master file never leaves the central filing area, those departments that need to refer to a file to perform some activity—underwritings, claims, actuarial projections—can receive a duplicate of the entire file. No delays occur because a file has been charged to another department.

The Right Time

Information has a definite time-value: it is important at the time it is needed to make a decision. Archivists and records managers should strive to get information to people at the appropriate time and not after the urgency has passed.

Without a doubt, the value of information decreases with time. When an angry customer is on the telephone, it is important to be able to retrieve quickly the information necessary to resolve the situation. Six months later, the information that was once so crucial is seldom referenced. And after a few years, there probably is little reason to retain the information.

One way to illustrate the declining value of information over time is to construct a "reference curve" for a particular records series (see figure 1). Studies have shown that retrievals tend to decrease dramatically after a relatively short period of time. This is especially true of transaction records, such as check vouchers and credit card charge slips.[5]

People are more productive when microforms are generated as early as possible in the reference curve. While microfilming records *after* the greatest reference activity still will save storage space, it will not help the records users to do their jobs more efficiently. The potential for productivity gains comes from filming *early in the reference curve.* This eliminates the paper shuffle, prevents misfiles and lost documents, and speeds the delivery of the required information.

The Right Place

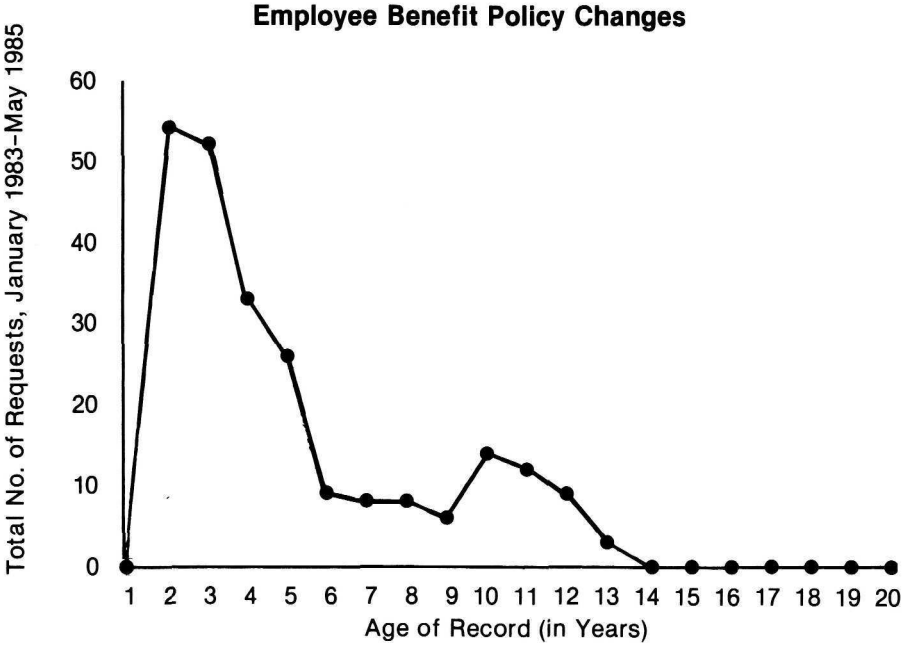
Many office workers spend a good deal of time just getting information they need to do their jobs. Getting information to the right place means bringing the information to the people, and not vice versa. We should not be in the "jitney business" of ferrying information between files and desks. Employees' time costs too much to waste it in this way.

Microfilm can help by putting more information at a person's fingertips. With less reason to leave a desk, more time can

[4]For information on COM, see Diamond, *Records Management*, 137–40; Maedke, Robek, and Brown, *Information and Records Management*, 394–96; Place and Hyslop, *Records Management*, 297–99; Waegemann, *Handbook of Records Storage*, 75–76; Alfred L. Clarke, "The ABC's of COM," *Journal of Micrographics* 5, no. 4 (March 1972): 205–06; and Truett Airhart, "Computer Output Microfilm: A Powerful Systems Tool," *Journal of Micrographics* 7, no. 3 (January 1974): 99–105.

[5]Thomas Wilds, "How to Generate and Display File Access History," *The Office* 96, no. 9 (September 1979).

Figure 1: A Reference Curve



This is an actual reference curve of a record series retained permanently at ITT Corporation: "Employee Benefit Policy Changes — ITT System Companies." Microfilming the record earlier in its life cycle increases the productivity of the organization by eliminating the need to retrieve records from storage.

be devoted to productive activities.[6] From a records management perspective, the objective is to microfilm records early in the reference curve and to place a copy of the microfilm in close proximity to the people who must retrieve information.

The Lowest Possible Cost

A logical question arises at this point: "Aren't computers a better way of achieving these objectives?" If by "better" one means "faster," the answer is yes. If by "better" one means "the most cost-effective," the answer is not so obvious.

To return to the reference curve, some requests require instantaneous access to the most current information available: one does not want a stock broker making investment decisions based on last week's information. On the other hand, not all requests require this immediacy: month-old budget information often is sufficient for managerial decisions.

[6]Diamond, *Records Management*, 142; Klunder, "Using Microfilm," 67. Williams addresses these points in his American Management Association seminar on "The New Tools of Records Management: Computers, Laser Disks, Soft Image Transfer and Micrographics."

In addition to providing up-to-the-minute information, computers are valuable for sorting information. For many applications, however, this sorted information is most efficiently stored on microfilm via COM. Though the costs of computer memory have dropped recently, magnetic media still are more expensive than microfilm for the storage of information.

Microfilm, however, is not always the most cost-effective storage option. In many cases, paper is still the best choice. At ITT items being retained for less than fifteen years generally are not microfilmed. Naturally there are exceptions, such as particularly voluminous record series. But in most cases, it costs less to store the paper for fifteen years than to microfilm the records.[7] The key is to think of microfilm as one of a range of choices, one point on the spectrum from computers to hard copy storage. Answering the ten questions presented earlier will help to identify the most cost-effective solution.

If, however, microfilming is selected, there is another cost decision to make: whether to film in-house or to use a service bureau. While there are no hard and fast rules in this area and every situation is different, it is possible to offer some general guidelines for making this decision. A micrographics service bureau would be appropriate in the following situations:

1) For tests and start-ups. The service bureau can provide needed expertise and quality control while archivists test micrographics or are trained.
2) For a small volume of work. In such cases, it is not worth the capital investment for the institution to purchase production equipment.
3) For a backlog or other one-time work. Unless extra staff will be hired to film a backlog, a service bureau can usually complete the project faster. Also, unless the microfilming needs are steady, it usually is better to contract with a service bureau.
4) For "odd jobs" or "headaches." If the repository holds only a dozen oversize maps, it is not cost-efficient to purchase a 35mm planetary camera; instead it is better to let a service bureau film this material. Similarly, many organizations use a service bureau for COM in order to avoid the headaches of producing it on such a short turnaround.

The capital investment for in-house microfilm production equipment usually is justified in the following cases:

1) For on-going work. If accounting records will be filmed every month, it makes sense to purchase at least the camera, if not the processors and duplicators.
2) For "day forward" projects. Although a service bureau may handle the backlog, additions to a series may be filmed in-house, as they are created.
3) For extremely sensitive records. For security reasons, some organizations will not permit their records to be handled by non-employees. Such records will be filmed in-house even if the volume of records or other considerations normally would not justify such a decision.

In terms of lowest possible cost, therefore, decisions are twofold: selecting the proper medium (paper, microfilm, computer, or even optical disk), and analyzing whether it is better to do the work

[7]The break-even point may be later than fifteen years for institutions with lower real estate costs than ITT has in New York City.

in-house or to use an outside service bureau.[8]

Conclusion

Archivists usually microfilm records that have reached the end of their life-cycle and are in inactive storage. By doing so, they miss much of the potential of microfilm for improving the productivity of an organization or institution. Microfilming records earlier in their life cycle—soon after creation or while they still are in active use—has two major advantages. First, it helps bring the right information, to the right people, at the right time, in the right place, and often at the lowest possible cost. Secondly, it helps bring the archivist to the right people, at the right time, in the right place, and when they most are in need of assistance. This increases the visibility of the archival program, builds allies within the organization, and insulates the archives from bureaucratic winds of change. Perhaps the moral of the story is: Think small to think big.

[8]See Diamond, *Records Management*, 138–40, 142–47; Klunder, "Using Microfilm," 67–68; Tom L. Harrison, "CRT vs. COM—Real Time vs. Real Enough Time," *Journal of Micrographics* 7, no. 1 (September 1973): 37–44; Maedke, Robek, and Brown, *Information and Records Management*, 399; Place and Hyslop, *Records Management*, 292; Waegemann, *Handbooks of Records Storage*, 63–69, 76–77; Frederick Klunder, "Managing a Microfilm Program," in *Taking Control of Your Records: A Manager's Guide*, ed. Katherine Aschner (White Plains, N.Y.: Knowledge Industry Publications, 1983), 88–96; Robert F. Williams, "Implementing a Microfilm System," *Information and Records Management* March 1976, 17–19; and several articles in the *Journal of Information and Image Management* 18, no. 4 (April 1985).

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