ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

PRODUCTION NOTE

University of Illinois at Urbana-Champaign Library Large-scale Digitization Project, 2007.
Library Trends

(Editor) Library Trends, a quarterly journal of librarianship, provides a medium for evaluative recapitulation of current thought and practice, searching for those ideas and procedures which hold the greatest potentialities for the future.

Published four times a year, in summer, fall, winter, and spring. Office of publication: University of Illinois Graduate School of Library and Information Science, 249 Armory Bldg., 505 E. Armory St., Champaign, IL 61820. Second-class postage paid at Champaign, Illinois. Copyright 1988 by The Board of Trustees of The University of Illinois. All rights reserved.

Subscription price is $50.00 a year (plus $2.50 postage for overseas subscribers). Single issues for the current volume year are $15.00 (plus $1.00 postage); all back issues are $10.00 (plus $1.00 postage). All foreign subscriptions and orders should be accompanied by payment. Address orders to Journals Department, University of Illinois Press, 54 E. Gregory Drive, Champaign, IL 61820. Editorial correspondence should be sent to Publications Office—Library Trends, 249 Armory Bldg., 505 E. Armory St., Champaign, IL 61820.

Indexed in Current Contents, Current Index to Journals in Education, Library and Information Science Abstracts, Library Literature, PAIS, and Social Sciences Citation Index.

Postmaster: Send change of address to University of Illinois Press, 54 E. Gregory Dr., Champaign, Ill. 61820.

PRINTED IN THE U.S.A.
ERRATA

Please note that in the “Library Buildings” issue of Library Trends (vol. 36, no. 2) that the art for figures 1 and 2 in Marlys Cresap Davis’s article was placed in error. The art of the “before” drawing is on page 419 and the “after” drawing is on page 418. Library Trends apologizes to Ms. Davis and its readers for this oversight.
Automating Intellectual Access to Archives

ANNE J. GILLILAND

Issue Editor

CONTENTS

Anne J. Gilliland 495 INTRODUCTION
Lisa B. Weber 501 EDUCATING ARCHIVISTS FOR AUTOMATION
Anne J. Gilliland 519 THE DEVELOPMENT OF AUTOMATED ARCHIVAL SYSTEMS: PLANNING AND MANAGING CHANGE
Steven L. Hensen 539 SQUARING THE CIRCLE: THE REFORMATION OF ARCHIVAL DESCRIPTION IN AACR2
H. Thomas Hickerson 553 ARCHIVAL INFORMATION EXCHANGE AND THE ROLE OF BIBLIOGRAPHIC NETWORKS
Patricia D. Cloud 573 THE COST OF CONVERTING TO MARC AMC: SOME EARLY OBSERVATIONS
Frederick L. Honhart 585 THE APPLICATION OF MICROCOMPUTER-BASED LOCAL SYSTEMS WITH THE MARC AMC FORMAT
W. Theodore Dürr 593 AT THE CREATION: CHAOS, CONTROL, AND AUTOMATION—COMMERCIAL SOFTWARE DEVELOPMENT FOR ARCHIVES
Matthew B. Gilmore 609 INCREASING ACCESS TO ARCHIVAL RECORDS IN LIBRARY ONLINE PUBLIC ACCESS CATALOGS
This Page Intentionally Left Blank
Introduction

ANNE J. GILLILAND

Theodore Schellenberg, one of the most influential American archival theorists, wrote of “basic methodological differences between the archival and library professions,” stating that

the materials received by a librarian are referred to as acquisitions, denoting purchases, gifts, and exchanges, while those of an archivist are called accessions, which are received by transfer or deposit; the librarian selects his materials, while the archivist appraises his; the librarian classifies his materials in accordance with established classification schemes, while the archivist arranges his in relation to organic structure and function; the librarian catalogs his materials, while the archivist describes his in guides, inventories, and lists.¹

Schellenberg further defines archival materials (books, papers, maps, photographs, and other documentary media) as being of an administrative nature and housed by an institution because of their legal, functional, and informational value.² These differences between the methodologies of the archivist and the librarian, the administrative and unique nature of most archival collections, and the practice of collection v. discrete item level description, have often been emphasized by both archivists and librarians as reasons why archivists have been unable to develop automated bibliographic or descriptive systems similar to, or compatible with, those of libraries. Archivists as a profession, have traditionally strived to retain their own identity distinct from that

Anne J. Gilliland is Staff Archivist/Records Specialist, Archives and Rare Books Department, Carl Blegen Library, University of Cincinnati, Cincinnati, Ohio.
of the much larger, better financed, and more cohesive library profession, and nowhere is this more evident than in the history of the development of automation.

The development of automated systems independent of library and other information systems and the ability to use the processing capabilities of computers to improve intellectual access to the contents of archival collections, began in the 1960s. Progress was hindered, however, not only by the conceptual difficulties arising out of archival theory and practice, and the very diverse and specific subject areas, media, and formats which archival holdings encompass, but also by the relatively small size and low profile of many archival operations when compared to libraries. Another serious impediment has been the continuing absence of a sustained level of funding. Many pioneering applications in automation have relied heavily upon grant support, but in an environment where operating budgets for many basic manual functions rarely achieve high institutional priority, the costs of even the most inexpensive and standardized automation may well prove prohibitive.

Recent developments, the cumulation of two decades of debate and experience, indicate that it is now time to reevaluate the state of archival automation and its relationship to other information systems. These include the availability of inexpensive, powerful microcomputers and commercial and custom-designed archival software. The most notable and influential development, however, is the USMARC format for Archival and Manuscripts Control (AMC), which has become the professional standard for recording in machine-readable form descriptive data on archival collections.

It is increasingly apparent that even if an archive chooses not to adopt the MARC AMC format, nonetheless, it will still have to respond to the way in which the format will affect the profession's and the users' information storage and delivery expectations. The MARC AMC format has made national databases of information about institutional holdings, which previously were not available, accessible in a centralized form to researchers and other archives and collectors. Those archives that have chosen not to include data concerning their collections in the bibliographic utilities such as RLIN or in the local online public access catalogs which may be in place in their institutions, will not be able to reach potential users and resources as effectively as those archives that have chosen to participate. They might, in fact, lose ground since such vast bibliographic systems often are mistakenly assumed to be comprehensive by a user, who may then neglect to search further. Because the format raises the minimum descriptive levels of
Introduction

materials far above the current practices of many archives, and because
the archival profession is placing an increased emphasis on assisting the
user, use of the AMC format will gradually, but inevitably, increase
researchers' expectations; regardless of archives' traditional descriptive
standards, users will expect standardized access to materials at each
archive where they conduct research.

This Library Trends issue looks at some of these new developments
and their implications, and attempts to establish the role of archival
automation in the wider context of library and information systems,
since, as Schellenberg pointed out:

To emphasize the basic differences between the two professions is not,
of course, to ignore those areas where they have much to contribute to
each other. With respect to their holdings, archivists and librarians
share the common objective of making them available as effectively
and economically as possible. For this purpose both should know, in
general terms at least, what information the other can provide for
inquirers.3

Looking at the implications of the AMC format for automation and
greater integration in the 1980s, Steven L. Hensen, as a contemporary
commentator, reinforces the same approach.

The AMC format has given the archival community the opportunity
to become a full partner in the broader information community of
which it was always an obvious and natural (albeit unwitting) part.
For the first time, archivists have a real stake in matters that were
previously the sole province of librarians; cataloging rules, name
authorities, and subject headings are now firmly a part of the archival
lexicon. Archivists will make their voices heard on the councils that
decide on such things or they will almost certainly regret it.4

Given the diverse nature of archival collections, this issue cannot
claim to be either comprehensive or definitive in its coverage. It concen-
trates, therefore, less on archival or technical theories, and more on the
practical aspects of developing and providing automated systems that
will facilitate machine-readable description of archival materials as
well as increased access by the researcher. In order to take full advantage
of emerging trends and standards, archivists, regardless of background
or affiliation, will have to consider solutions to an array of issues—
funding, education, data formats, retrospective conversion, links with
wider bibliographic systems, staff and user needs, acceptance and expecta-
tions, hardware and software configurations, and continuing technologi-
cal change—when coping with the design, implementation, and
maintenance of an automated access system. Automation of administra-
tive functions such as inventory control and records management is not
specifically addressed in this issue, but that process is, of course, closely related.

The topics of the articles in this issue are intended to address these considerations in a broad, thought-provoking manner. The articles highlight common ground between diverse applications, rather than dwelling on specific types of archives such as academic, government, or religious archives, or museum-type institutions. The papers by Weber and Gilliland deal with many basic questions of how archivists actually get to the stage of automation, and the educational and managerial issues that they face. Although technical standards are increasingly in place, it is these issues that are emerging as the major stumbling blocks to successful implementation of automated systems and they have yet to be substantially discussed in the professional literature. Hensen, Hickerson, and Cloud have contributed articles regarding different aspects of using the MARC AMC format: as an evolving descriptive format that requires specific cataloging skills; as a tool for bibliographic interchange, particularly through the Research Libraries Information Network archival segment; and as a new format, the adoption of which carries with it considerable retrospective conversion implications and costs. Articles by Gilmore, Honhart, and Dürr examine the development and marketing of microcomputer-based systems that have been purpose-designed for archival applications. Honhart discusses MicroMARC:amc, which is the first commercially available microcomputer system to support the AMC format on a local basis while at the same time facilitating data interchange with other systems. It is, therefore, a development that many archivists, particularly those responsible for smaller archives, are watching very closely. Dürr and Gilmore both discuss non-AMC applications and other possibilities for integrating local archival data into wider information systems. Their papers are significant in that they focus attention on viable alternatives to AMC-based systems—some of which have been operating successfully in an integrated environment for several years.

Many of the articles reflect the authors' considerable experience—their practical knowledge, their research with specific applications, and their consistent involvement in the considerable professional debate that has raged over the last twenty years. Other articles inject fresh points of view into the discussion. I hope that this Library Trends issue will lead archivists and librarians alike to speculate further on the implications of current developments in automated archival access systems as they relate to the archival profession as a whole, and in their relation to other information systems.
Introduction

References

2. Ibid., p. 16.
This Page Intentionally Left Blank
WHY AUTOMATION EDUCATION?

Although often chided for lack of concern about automation,¹ more and more archivists and manuscripts curators are welcoming the use of computers to obtain better control over the materials in their custody. This new level of automation activity has, in turn, fueled an equally eager pursuit of education and training opportunities. Archivists want to learn about automation in general, as well as about automated archival techniques in specific.

What may appear to be an abrupt about-face has actually been a gradual evolutionary process. Faced with the challenge of coping with the glut of documentation produced by our contemporary society,² some archivists have long viewed the use of automation as a logical way to handle this onslaught. Members of the profession have, in fact, been involved in the development and use of in-house computer systems since the 1960s. It is no coincidence that for the past quarter-century, those players in the “automation game” were the major, well-established institutions with staff and budgeting resources as well as access to data processing equipment and professionals; they were the only ones who could afford to invest in automation. Computer hardware, the development of customized software, and ongoing maintenance were all costly. Archivists in other institutions, could only look on from the sidelines and read in the archival literature about such

LISA WEBER

systems as the Library of Congress' Master Record of Manuscript Collections; the National Archives and Records Administration's SPINDEX (Selective Permutation INDEXing) and NARS A-1; the University of Illinois' PARADIGM; and the Smithsonian Institution's SELGEM.3

This scenario is, however, quite different today. A recent, and pioneering, survey conducted by the Society of American Archivists (SAA) shows that over 265 archival repositories are involved in some kind of automation activity.4 A second SAA survey, conducted to gather information for its newly formed Education Office, revealed that archivists chose automation as the leading management issue about which they wanted to learn more. In this survey, automation outranked such other topics as preservation, legal issues, planning, finance, and personnel.5 Contrary to popular perception, it was evident that archivists strongly desire education and training in automation.

Why all this automation activity and such a strong interest to learn? The most important reason is that low-cost, powerful, and easy-to-use microcomputers make automation more accessible to archivists than previously. A second reason for the change is the advent and increasing acceptance of the MARC (MAchine-Readable Cataloging) format for Archival and Manuscripts Control (AMC). These are not the only relevant parts of the archival automation education equation, however. The profession is also concurrently coming to grips with the broader spectrum of archival education. Recent approval by the SAA Council of a plan for individual certification demonstrates that the archival profession is, albeit laboriously, resolving some of its long-pondered questions about graduate archival education programs, preappointment v. postappointment training, and professional standards.

It is not surprising then that archivists have, to date, written very little about automation education.6 However, as a result of these trends which are simultaneously gathering momentum (increased automation activity, education, and a clearer definition of professional archival education), educating archivists for automation has finally come to the fore.

WHAT KIND OF AUTOMATION EDUCATION?

What do archivists want to learn about "archival automation"? Unfortunately, the phrase itself can be misleading because it covers a vast spectrum of activities. Archival repositories, like every other organizational entity, have a wide array of office automation tools from which
Educating Archivists for Automation

to choose. Word processing, spreadsheets, and list processing are capabilities that many "off-the-shelf," generic, commercial software packages offer to users. These tools enable archivists—and anyone else working in office environments—to perform more effectively the daily tasks of writing letters, memoranda, and narrative reports; producing mailing lists; and constructing and monitoring budgets. This paper will not focus on these kinds of general automation uses, nor will it address the concerns of machine-readable records created by automated processes, which eventually will be added to archival collections. It will, instead, concentrate on those applications of automation that are specific to the administration and use of archives.

In general, although archivists are curious about a wide range of automation activities, their interests fall into three broad categories: applications of automation in archives; the MARC AMC format and the standards used in conjunction with it; and new and emerging computer technologies.

Applications of Automation in Archives

Archivists, by and large, have approached automation through individual archival functions rather than by developing an integrated archival automation system that would accommodate all archival functions. These functions range from collection development (solicitation files in manuscript repositories or records schedules in archives) to records administration (accessioning, processing, describing, preserving, and space management) to reference service. Building an integrated system is a complicated and sophisticated task that most archivists have neither the money nor the staff to undertake. Even though some archivists have access to mainframe and minicomputers, most archivists are microcomputer users.

The majority of archivists want to use commercial software packages to help them with a wide range of archival functions. The ease of editing and updating makes using word processing packages to produce registers, inventories, folder and box lists, catalog cards, and other sorts of finding aids, extremely attractive. Archivists can also use database management software to produce inventories and indexes as well as to keep track of all kinds of administrative information, such as box location, patron registration, accessions, donor information, and collection-use statistics. Online searching of records descriptions, at any level, expands access to materials. Archivists, therefore, want to learn how to apply these automation capabilities to a variety of their activities.

WINTER 1988
MARC AMC Format and Standards

Only six years ago, SAA's National Information Systems Task Force (NISTF) was redefining its role away from examining how to approach the issue of national archival information systems (then embodied in the National Historic Publications and Records Commission's database project and the *National Union Catalog of Manuscript Collections* [NUCMC]) toward a new mission of establishing the "pre-conditions" for archival information exchange. When NISTF recognized the need for a common exchange format, it decided to work within existing national and international communications standards. This meant MARC. The end product of this work was the MARC AMC format, the development of which is discussed in detail in other articles in this issue. The AMC format provides a technical structure—a container—for exchanging data, and a framework for organizing it, but the content of the data elements is defined by standards "outside" of the format. Information-sharing works only if all those exchanging or integrating data use a common approach to describing materials. Moreover, because archivists are increasingly involved in the library community, it is imperative that they work within the broad library-standards framework. Archivists not only want to learn about the MARC AMC format, but they also want to learn about the standards used in conjunction with the format.

Agreeing upon archival descriptive standards has been almost as elusive as the pot of gold at the end of the rainbow. NISTF, well aware of the situation, consciously decided to avoid the "depths of the descriptive standards problem" when they were defining the format. Unlike the library community, which has developed and used standard rules to catalog duplicate materials for decades, the incentive of derivative cataloging never existed in the archival community because of the unique nature of the materials. Instead of a common standard, archivists developed a variety of descriptive methods.

The desire to use the AMC format, however, and to integrate descriptive information into larger library networks, is giving archivists the incentive they need to standardize description. Because the library community developed most of the standards archivists need to use with the AMC format, archivists need to learn these rules.

*The Anglo-American Cataloguing Rules, 2d ed.* *(AACR2)* and the *Library of Congress Subject Headings (LCSH)* are the most important library-created standards used in conjunction with the AMC format. Although most archivists are following Hensen's *Archives, Personal Papers and Manuscripts* *(APPM)*, instead of Chapter 4 of AACR2,
Educating Archivists for Automation

AACR2 has not been entirely displaced. Archivists need to follow the rules outlined in the second part of AACR2 when constructing headings for access points to descriptions. These rules and standards, however, are complex and sophisticated. Archivists need more training and education in applying them to archival description.

New Computer Technologies

As overwhelming as they appear at times, new computer technologies require archivists' attention. The whole array of laser disk technology, for instance, from videodiscs to digital optical disks and audio discs, threatens to confuse even the most technologically oriented. Nevertheless, this technology demands consideration because of its potential for storage, retrieval, and dissemination of images, data, and audio recordings, as well as for the preservation of the multiple types of media that archivists encounter. The promise of low-cost storage, repeated use without deterioration, rapid random access, interactive environments, and ease of reproduction, cannot be ignored by archivists. Other examples of technologies that archivists should monitor include the development of artificial intelligence systems and their potential archival applications, high speed text search systems, and text conversion capabilities. Computer technology is evolving at a tremendously rapid rate and archivists need and want to keep informed of these recent technological advances.

WHERE ARE THE EDUCATIONAL OPPORTUNITIES?

Where are archivists finding the educational opportunities to learn about the various aspects of automation? Certainly, archivists look first within the profession itself; professional associations are providing a host of different kinds of educational opportunities.

Professional Associations and Meetings

The SAA is the principal national association for archivists and manuscript curators—it has over 4,200 individual and institutional members. One of its primary missions is to advance professional education. In response to archivists' demand for education about automation, the SAA developed its Automated Archival Information Program. Partially funded by the National Endowment for the Humanities (NEH),
the primary purpose of this program is to provide education and information about automated archival activities in North America.

Two major activities of the program do this directly. The first is a workshop that introduces people to the MARC AMC format. This two-day workshop, often given in conjunction with meetings of regional archival organizations, provides a basic understanding of the MARC AMC format and introduces the descriptive standards used in conjunction with it. The workshop teaches the "generic" structure (that is, the MARC AMC format alone, not tied to a specific automated system such as the Online Computer Library Center [OCLC], the Research Libraries Information Network [RLIN], or Michigan State University's MicroMARC:amc) and gives participants a fundamental understanding of how to apply MARC AMC in their own repository settings.

A second focus of the program is the development of an automation "clearinghouse," or set of files that maintains information about the state of archival automation efforts across the United States and Canada. Specifically, SAA is creating a machine-readable database that contains information about the kinds of hardware, software, and applications which archival repositories are currently using. The purpose of the clearinghouse is information dissemination—it helps put archivists in contact with others who are using or thinking of using specific kinds of hardware and software for archival applications. Although not a structured educational activity, the clearinghouse offers multiple opportunities for archivists to interact and learn from each other. For example, archivists can share a wealth of information about software packages: applications, data element definitions, file structures, and problems encountered and solved. The possibilities are endless. Information gleaned from the clearinghouse files is periodically reported through the *SAA Newsletter*, and individual inquiries are directed to the SAA office.

SAA offers many other educational opportunities in addition to the Automated Archival Information Program. The society's Automated Records and Techniques Task Force (ARTTF) has developed a core curriculum to teach archivists and manuscripts curators the fundamentals of automated techniques. Their workshops, often held in conjunction with SAA's annual meetings, include such titles as "Basic Computer Concepts," "Automated Techniques in Archives," "Basic Data Bases and Planning Concepts," and "Integration of Data Between Commercial Software Packages in an Archival Setting." The SAA Education Office organizes and coordinates the entire array of education offerings.
In addition to these targeted opportunities that focus on automation education, SAA's annual meeting programs are filled with sessions that also grapple with archival automation issues. For example, the 1987 program included sessions entitled "Preparing for Automation: What To Do Before the Computer Comes," "Reference and the Age of Automation," "Archives Information Management: Plugging the Software Gap," and "The MARC AMC Format: Applications for Academic Archivists." Given the demand for information about archival automation, it is not surprising that over the past five years annual meeting sessions about automation have consistently had the highest attendance.

Another SAA educational offering is a series of "Roundtables"—informal groups of archivists who come together at the annual meetings to discuss and exchange information about particular topics. Some of these roundtables have become de facto users' groups: two of them are focused on the OCLC and RLIN automated systems. SAA members have discussed forming several other roundtables, including one each for the microcomputer software packages MARCON and MicroMARCamc. Archivists have also formed a group for MARC VM (Visual Materials) Users.

Finally, one of the most attractive educational opportunities at the annual meetings is the exhibit area. Each year, the SAA exhibit area is filled with more and more computer vendors eager to talk to archivists about their various automation products.

Another archival organization concerned about automation education is the National Association of Government Archives and Records Administrators (NAGARA). Although smaller than SAA, with approximately 300 individual and institutional members, NAGARA provides leadership for the management of government records in the United States. NAGARA's annual meeting programs consistently contain workshops and sessions about automation; the 1987 program theme, "Government Archives in an Information Age," included the sessions "Automating Records Information Systems" and the "Seven-States RLIN Project and the Future of Automation." The Research Libraries Group (RLG) project is of particular interest to government archivists because not only is it building a database of information on government records holdings, but it is developing a thesaurus of terms that describe state archives' functions, and is testing the feasibility and utility of sharing archival appraisal information online.

The Association of Canadian Archivists (ACA) is a third national archival organization that offers education about automation. Its 1987
meeting theme, "Archives and the Information Age," is similar, if not somewhat broader, than that of NAGARA. All ACA session papers and workshops were within the context of the "information age," addressing such topics as planning, automated access, designing archival databases, indexing and cataloging, and appraisal. Significantly, the NAGARA and ACA meetings marked the first time that any national North American archival organization (let alone two!) devoted an entire program to the theme of automation.

Regional archival organizations are another group within the profession, and these organizations provide a variety of educational opportunities. For such a small profession, archivists across the country have formed an astonishing number of regional alliances. The current Directory of Regional Archival Organizations lists thirty-six such groups. These regional organizations range from large, multistate groups that have nearly 1,000 members who gather at formal biannual meetings (examples include the Mid-Atlantic Regional Archives Conference [MARAC] and the Midwest Archives Conference [MAC], to small, local groups that congregate informally several times a year (the Boston Archivists Group [BAG] and Twin Cities Archives Roundtable [TCART] are typical). Like the national associations, the regional groups offer a chance for archivists and manuscripts curators to learn about archival automation in a variety of ways. For some archivists, the regional groups can be more convenient, affordable, and accessible than the national organizations.

Nearly every meeting program of the larger regional organizations includes sessions or workshops about archival automation. For instance, the Society of California Archivists' 1987 program contained a two-part session about decision-making for automation. In the spring of 1987, the Kansas City Area Archivists presented a one-day symposium entitled "History 'On Line,'" which discussed the topic of computers and historical collections. In 1986, the Midwest Archives Conference, with grant funds from the National Historical Publications and Records Commission, offered a host of workshops, including three specific to automation: "Using Commercial Software in the Archives," "Introduction to MARCON and MicroMARC:amc," and "An Introduction to Using Microcomputers."

The National Archives and Records Administration is involved in several archival automation research and development projects, including optical disc technology, optical character recognition, conversion of paper-based finding aids, and artificial intelligence for reference applications. In December 1987, the National Archives held its first automa-
Educating Archivists for Automation

tion conference entitled "Automating the Archives," to describe and disseminate information about its activities.

Educational opportunities for learning about automation exist through associations and meetings outside the archival profession as well. Although many of these activities may not be directly focused on archival automation, archivists and manuscript curators have much to gain by exposure to sessions, workshops, and vendor exhibits that present innovative ideas and technology. It takes just a short leap of the imagination to see related archival applications.

The American Library Association and the Special Libraries Association offer archivists and manuscript curators a number of educational opportunities. The library community’s interest, concern, and use of new computer technologies give archivists and manuscript curators the chance to see firsthand applications of automated techniques at conferences, workshops, and meetings. Those archivists who are interested in the cutting edge of research and evaluation in information science and technology should become acquainted with the American Society for Information Science (ASIS). This interdisciplinary group of librarians, computer scientists, information scientists, and vendors sees its role as promoting research and development in information science. Many of the problems confronting archivists and manuscript curators are identical to those confronting other information professionals—for example, information storage and retrieval techniques and the use of artificial intelligence. ASIS provides a forum for all information professionals to come together and learn from one another.

Possibly not as well known in the library community are professional organizations such as the Association of Records Managers and Administrators (ARMA) and the Association for Information and Image Management (AIIM). These groups, both with annual meetings and regional chapters, also provide forums for learning more about automation in an information environment.

Publications

Perhaps the most accessible form of education is reading the literature concerning archival automation. As interest and activity in archival automation have increased, so have the available publications. Journal articles about specific applications, theoretical concepts and ideas, and software reviews are the most numerous. Archival journals that frequently carry these kinds of articles and reports include The
American Archivist (SAA), the Midwestern Archivists (MAC), Provenance (Society of Georgia Archivists), and Archivaria (ACA). Most of the national and regional associations also publish newsletters that occasionally include archival automation news.

One of the most exciting recent events is the publication of a two-part journal entitled Archival Informatics Newsletter and Technical Reports. The newsletter prints updates on uses of automated techniques in archival repositories and museums, while the technical reports are assessments of particular technologies and the opportunities they present to archives and museum management. The first technical report assesses the implications of optical media.

Thus far, book-length publications about archival automation are few. Two works that provide an overview of the structure and implementation of the MARC AMC format are Nancy Sahli's MARC for Archives and Manuscripts: The AMC Format and Max J. Evans and Lisa B. Weber's MARC for Archives and Manuscripts: A Compendium of Practice. Richard M. Kesner's Automation for Archivists and Records Managers: Planning and Implementation Strategies gives archivists and manuscript curators the basic principles and tools for planning and implementing automated systems. Kesner has also compiled Information Management, Machine-Readable Records, and Administration: An Annotated Bibliography. In addition, the American Archivist publishes a yearly bibliography that includes an automation section.

The National Archives has published several reports summarizing research in various areas. These reports include The MARC Format and Life Cycle Tracking at the National Archives, and Technology Assessment Report: Speech Pattern Recognition, Optical Character Recognition, Digital Raster Scanning. The importance of publishing and disseminating developments in archival automation cannot be overemphasized. These publications promote professional awareness and expertise and ultimately advance the entire profession.

Coursework

Taking college or university coursework is obviously the most formal approach to learning about archival automation. The 1986 SAA Education Directory lists seventy-six multi- or single-course programs or institutes that teach archival administration. The vast majority of these programs are parts of the history and/or library and information
Educating Archivists for Automation

science departments on college and university campuses. Of these, only eleven programs show courses covering archival automation.

However, most, if not all, library and information science departments offer courses in information science, computer technologies, and automated applications. In addition, many community colleges and adult education programs provide evening classes in different aspects of computer science and technologies.

Formal courses require a greater commitment of time and money than the other options mentioned earlier. On the other hand, coursework offers a depth of education and training that may not be possible in short workshops and institutes.

HOW DOES PROFESSIONAL ARCHIVAL EDUCATION FIT IN?

From the time of the presidential address at the first SAA annual meeting in 1936 up to the present, SAA membership has heard and considered numerous proposals for a structure and procedures that would establish standards for the archival profession. If archival standards are to be strengthened and extended it is imperative that archival education, both at the entry and continuing education levels, also be strengthened. Archival education is the key to professional standards.

The responsibility for archival education historically has been caught between two different academic traditions, history and library science. Early on, it was assumed that history departments would take the lead, but others saw the close parallels between library science and archival administration and so advocated placing archival education programs in schools of library science. A program to accredit archival education programs had its supporters but it did not seem feasible to the profession.

While considering how to proceed in the area of "standards," the profession concentrated on developing guidelines and models (that is, voluntary standards) in different areas of the profession. SAA's Committee on Education and Professional Development prepared guidelines for graduate education programs in 1977 and again ten years later. During the 1980s, SAA's Task Force on Institutional Evaluation developed principles and guidelines for the self-study of archival repositories. In 1986, the Society's Task Force on Goals and Priorities published a major planning document for the profession that provides a framework for archival planning and decision making.
After several years of intense discussion, research, and debate, the SAA Council approved, during its January 1987 meeting, a plan to certify individual archivists. The purpose of certification is to establish the professional qualifications, knowledge, skills, and abilities of practicing archivists rather than those planning to enter the field. The examination has yet to be developed.

Advocates for certification assert that it will create, raise, or make uniform the standards of archival practice, and that it will help to establish criteria for professional accomplishments. Opponents argue that educational standards should be strengthened first; that the program will absorb too many resources; that too few archivists will pursue certification; and that certification is philosophically wrong-headed or excessively technical in nature. Opinions for and against still run strong within the archival community, and much work remains before the concept is fully developed and workable.

How does the move toward more concrete (and enforceable) standards apply to archival automation education? The approved certification plan itself does not delineate any of the skills or experience required of a "certified" archivist. An appointed board is now beginning to wrestle with those thorny issues. The newly proposed "Guidelines for Graduate Archival Education Programs," on the other hand, does incorporate within its structure the need for archivists to be educated about automation. The highly praised report of the Task Force on Goals and Priorities, Planning for the Archival Profession, also addresses many of the concerns about archival automation in this information age. Since "the real challenge of automation is to rethink almost everything learned about traditional archival operations and procedures," archival automation confronts the very core of archival education. It will be the profession's responsibility to see that the challenge is met.

FUTURE ARCHIVAL AUTOMATION EDUCATION NEEDS AND DIRECTIONS

Considering the complexity, diversity, and possibilities of archival automation, an education agenda for the future is quite an exciting, if not daunting, task. Notwithstanding the current available opportunities outlined earlier in this article, there are several major areas that need to be addressed in the future.
Educating Archivists for Automation

Standards

Teaching the SAA workshops on the MARC AMC format made the instructors keenly aware that the format itself, although initially intimidating, is relatively easy to learn. What tends to perplex archivists and manuscripts curators much more, even those who have taken cataloging courses in library school, are the standards used in conjunction with the format. For this reason, SAA, through its Automated Archival Information Program, has secured funding from NEH to develop a new workshop that will teach these standards.

The standards workshop will endeavor to familiarize archivists with the applications of AACR2, the Library of Congress Name Authority File, the Library of Congress Subject Headings, and other standards such as the list of function terms currently under development by the RLG Seven-States Project. The workshop will also acquaint participants with the fundamentals of the theory and practice of standards in general. Choosing and constructing personal and corporate names, subject headings, genre and form terms, and other access points are complex and difficult tasks. The standards workshop will help archivists and manuscript curators to approach this undertaking with greater understanding and confidence.

Related to the need for more education about standards is a need for expanded guidelines for archival description. With the publication of Hensen’s APPM,26 for the first time archivists and manuscript curators have a standard set of agreed-upon rules to follow to help them describe historical records. Although APPM is a successful and consistently used tool, it is not definitive in its coverage. SAA intends to publish an expanded version of APPM in the summer of 1989 as part of its NEH funding for archival standards. The revision of APPM will give archivists and manuscript curators a better, more complete set of standards to describe their materials and will contribute to the development of uniform descriptive standards that can be integrated into library and other information systems.

Shared Access and Potential Uses

While archivists and manuscript curators need further education in order to create serviceable, shared databases of information about primary resource materials, they also need to exploit the applications of the existing national databases that are daily increasing in size. It is often assumed that the sole reason archivists are developing national union databases of archival descriptions is so that scholars, researchers, and
other users of historical records will have more complete and timely access to archival materials. This is indeed one of the incentives for exchanging information, but archivists must go beyond just educating themselves and think about educating archival users as to how the databases can assist them in their research.

The archival profession has paid shamefully little attention to its user communities. With the development of automated databases, the opportunity is ripe to do systematic, quantifiable studies of the users of archival materials. It is the perfect means of learning how people approach and get access to the information in historical records. The debates between subject access vs. provenance as a means of retrieval, and the recent assertion of the retrieval power of combining “form of material” with “function” of the creating organization, can be tested within the context of these databases. Databases of descriptions of primary resource materials are new and exciting tools that have the potential for tremendous impact on the way archivists describe records. First, however, serious, rigorous research in user approaches and information retrieval strategies is required.

There are many more reasons to exchange or share information about archival records. Librarians have been using bibliographic databases as a tool for collections development and archivists see similar possibilities. Many archives are interested in sharing appraisal information to help each other in making disposition decisions about the records that could potentially come into their custody. In fact, the RLG Seven-States Archives Project is currently testing this concept.

Sharing authority data is another possible use of national archival databases. Although certainly not a new idea in the library community, the concept of authority control is a relatively recent arrival on the archival scene. As NISTF members defined the data elements for the dictionary, they began to see relationships or categories of information that archivists keep. One such category is authority: information about the individual or organizational creators of the materials. Biographical notes and administrative histories comprise archival authority information. Archivists are now discovering that by keeping authority records separate from, but linked to, records that describe the actual materials, a whole host of possibilities is becoming evident.

**Systems**

Archivists must continue to develop and refine systems, or entice vendors to build new systems that meet the profession’s needs. NISTF
Recognized that archivists tend to create separate automated systems for administrative control v. intellectual or descriptive control of the archival records. The Task Force also recognized that these two functions were related, and it proceeded to define a standard format that would encompass both requirements. The revised MARC AMC format contains data elements for descriptive purposes, but it also accommodates the concept of control over archival processes or actions that are performed upon the records themselves.

The format or standard structure is only half of the equation, however. Of equal importance is having software that performs the necessary functions. Being able to input action information into a MARC record does not necessarily mean one can "do" anything with it. What many archivists are looking forward to is an integrated system that can import and export MARC AMC records; control archival and manuscript material throughout their entire life cycle; maintain more detailed levels of description; keep track of donor or scheduling data, patron use, and reference requests and other like data; and support linked authority files.

Software packages with MARC AMC record import-export capabilities currently exist that provide varying levels of control over archival materials, but further development is needed. Some members of the archival community are interested in the development of a local workstation application linked to larger networks that would maintain some data locally but would let other pieces of information migrate to the national database. Integrating more detailed finding aids, such as folder or box listings, registers, and inventories, with more general levels of description within the AMC format is an additional development direction. For those who are not interested in an integrated system that can import and export MARC records, software development for a variety of archival functions is still needed.

New Technologies

The computer revolution is truly that. It has changed the shape of our lives in ways we are just beginning to recognize. Technological advancements take place at such a rapid rate that archivists constantly need to look ahead in an attempt to discern what is coming next and how the new developments will change what they are currently doing.
CONCLUSION

Automation challenges the basic assumptions underlying archival practice. More than one archival prognosticator has warned that the archival profession will be subsumed by other professions and disappear unless archivists confront the technological revolution head-on and abandon the familiar "passive role of recipient of documents to [take] a more active role in the creation, distribution, and preservation of information." To do this, archivists must thoroughly educate themselves in archival automation. The opportunities are available now, and will continue to expand in the future. It may take a leap of faith to begin the educational process. New and unknown territory is always difficult at first. This education is, however, critical to the very existence of the profession. Automated techniques and applications are perhaps the most exciting area in the archival profession today, with both tremendous challenge and opportunity.

Appendix

Addresses and Telephone Numbers of the National Associations

American Library Association (ALA)
50 East Huron Street
Chicago, IL 60611
312/944-6780

American Society for Information Science (ASIS)
1424 16th Street NW, Suite 404
Washington, D.C. 20036
202/462-1000

Association of Canadian Archivists (ACA)
P.O. Box 2596
Station D
Ottawa, ON
Canada K1P 5W6
613/232-3643

Association for Information and Image Management (AIIM)
1100 Wayne Avenue, Suite 1100
Silver Spring, MD 20910
301/587-8202

Association of Records Managers and Administrators (ARMA)
4200 Somerset, Suite 215
Prairie Village, KS 66208
913/341-3808

National Association of Government Archives and Records Administrators (NAGARA)
Executive Secretariat
NYS Archives
10A75 Cultural Education Center
Albany, NY 12230
518/473-8037

Society of American Archivists (SAA)
600 South Federal, Suite 504
Chicago, IL 60605
312/922-0140

Special Libraries Association (SLA)
1700 18th Street NW
Washington, D.C. 20009
202/234-4700
Educating Archivists for Automation

References


4. Administered by SAA's Automated Archival Information Program, this is the first time that SAA has conducted a comprehensive survey about automated archival activities in all archival institutions, regardless of repository type. Previously, SAA's Automated Records and Techniques Task Force conducted surveys about automation in various types of repositories. See Stout, Leon J., and Baird, Donald A. "Automation in North American College and University Archives: A Survey." American Archivist 47(Fall 1984):391-404; DeWhitt, Ben. "Archival Users of Computers in the United States and Canada." American Archivist 42(April 1979):152-57; and Kesner, Richard M. "Automated Records and Techniques in Business Archives: A Survey Report." American Archivist 46(Winter 1983):92-95. The results of the most recent survey were still being tabulated at the time this article was being written.


9. Ibid., p. 360.

10. Chapter 4 of AACR2 is still valid and is used by some repositories.

11. Although outside the scope of this paper, it would be misleading to imply that archivists are entirely satisfied with these standards. Steve L. Hensen's paper in this volume details the problems archivists encounter using AACR2. Using LCSH presents problems for archivists as well. Problems include the inconsistencies within LCSH; the use of contemporary, not "historical" terms; chronological subdivisions that have been arbitrarily developed based on current book cataloging; form subdivisions; and geographic access. It is generally recognized, however, that in spite of all its problems it is necessary to work within the LCSH structure to ensure inter- and intrainstitutional compatibility.


The Development of Automated Archival Systems: Planning and Managing Change

ANNE J. GILLILAND

Introduction

AFTER ALMOST TWO DECADES of debate within the archival profession, there has been finally, in the last three years, enormous development and a transition toward archival automation. The archival profession has moved from the isolated and elitist position of a small number of archives using in-house, batch-oriented mainframe computer systems with cumbersome, locally developed software, to cooperative and integrated networks of archives using diverse mini- and microcomputer systems with commercial software, a variety of local, regional, national, and international databases, and automated bibliographic systems.

Two major factors have brought archives in the 1980s to this point. The first was the publication in 1984, of the MARC Archival and Manuscripts Control (AMC) format for standardized machine-readable archival description. The format, which is being increasingly accepted by archivists, has given archives a practical alternative to developing their own data format to describe their holdings, and a way to avail themselves of larger MARC-based bibliographic systems. The second factor is the rapid development of information storage and retrieval technology. With several inexpensive, expandable commercial options available for archival automation and networking, system configuration—while still a major consideration—no longer presents such overwhelming financial and technical problems.

Anne J. Gilliland is Staff Archivist/Records Specialist, Archives and Rare Books Department, Carl Blegen Library, University of Cincinnati, Cincinnati, Ohio.
For the first time, archivists have reached a point where the theoretical and technical issues which once seemed so insurmountable—if or how archivists should develop a national information system and the methods and purposes of machine-readable description—no longer pose an obstacle to the development of archival automated systems. The profession is now blossoming in all areas of automation in a trend similar to the experience of libraries and other online information systems in the 1970s.

Professional archivists must now confront a whole range of new management, planning, and user considerations which arise as a consequence of automation. This paper will provide an overview of some of these issues and, since there is little guidance yet to be found in the professional archival literature, it will also draw upon similar published experiences of libraries and other areas of information management.

HISTORICAL PERSPECTIVE

MARC formats for standardized machine-readable description were first developed in the 1960s by the Library of Congress for traditional bibliographic materials such as monographs. These formats provided a vehicle for data exchange which could be used by automated bibliographic systems. Although a format for manuscripts was developed, it was not well adapted to the bibliographic description of collections of archival records and did not ever archive widespread use.1

The Online Computer Library Center (OCLC), the first regional bibliographic utility, was established in 1967 as the Ohio College Library Center and quickly became a national and international cataloging and information resource. Other bibliographic utilities such as the Research Libraries Information Network (RLIN), the Washington Library Network (WLN), and the University of Toronto Library Automated System (UTLAS) were subsequently formed.

With the resulting savings from resource sharing, the political strengths of consortia, and the enhanced public image, libraries had access to increased capital funds, and their automated bibliographic systems flourished. Automated cataloging was expanded to integrate other local library functions, such as the manual catalog, circulation, and acquisitions. The first online public access catalogs (OPACs), now familiar to many library users, were set up in the mid-1970s.
Development of Automated Archival Systems

Although archival automation began in the mid-1960s, only now is it being recognized as a significant force in the information community. The delay was not so much a result of tardiness or lack of vision on the part of the profession, but rather a result of intellectual and financial constraints. Because of the discrete nature of archival collections, the incentives to automate archival systems were not resource sharing, integration, or outreach, nor was there interest in cataloging, circulation, and acquisition functions—at least not in the sense that these functions were understood by libraries. Likewise, an increased number of intellectual access points, although desirable as an aid to the archivist in reference functions, was not seen as crucial, and the shared processing of bibliographic information on collections did not seem especially useful given the uniqueness of most archival and manuscript materials. In fact, except for isolated examples, it is really only in the last two years that the provision of a public online access system similar to that of library OPACs has been seriously discussed, or integration with institutional library/information systems attempted.

In contrast to the needs of libraries, archives have been primarily interested in tighter administrative control over records (which is the main concern of the archivist as custodian). In the 1960s and 1970s, before the creation of the MARC AMC format, the need for records control spurred some larger archives toward pioneering developments of in-house automation systems. With these they were able to obtain better administrative management of their holdings and some archives even built in an indexing component. An assortment of archives in the United States and Canada used a software package, SPINDEX (Selective Permutation INDEXing), created by the Library of Congress, and the National Archives and Records Service (NARS, now the National Archives and Records Administration, NARA) for limited keyword indexing. And the Society of American Archivists (SAA) National Information Systems Task Force seriously considered ways in which SPINDEX software could be developed as the basis of a national information system for archives. Some of these early systems, put into use before the creation and widespread application of the MARC AMC format, are still operating successfully today, using locally devised formats, either on their own or in conjunction with parallel systems.

Several factors came together to prompt archivists to develop and adopt MARC AMC as a standardized descriptive format—rather than develop a standardized software package. (Confusion still arises on the question of format v. software, since MARC AMC, because of its association with many automated bibliographic systems, is sometimes mistakenly identified as a software package rather than a data format.) The
most important factors were the publication of the *Anglo-American Cataloguing Rules*, 2d edition (AACR2) in 1978; the results of Elaine Engst's Survey of Data Elements,\(^5\) which was published in 1982 and became the core of the MARC AMC format by the Society of American Archivists; the subsequent acceptance of the MARC AMC format; the development of a specific AMC segment for the use of archival repositories by RLIN;\(^6\) and the availability of commercial archival software such as MicroMARC:amc and MARCON which were designed with varying degrees of MARC AMC capabilities.\(^7\) These new conceptual, intellectual, and technological developments in archival automation enabled archives to glean the same advantages from data exchange as did other online systems.

**AUTOMATION-RELATED ISSUES NOW FACING ARCHIVISTS**

Apart from work by Kesner and Hickerson,\(^8\) very little has been written about specifically planning for archival automation. Nor has much been written about the effect that automation will have upon the operations, staff, and patrons of archives. Although there has been some discussion at professional meetings recently about user studies\(^9\) and system enhancements, these are areas that will require much more attention in the future, once patrons and archivists start to come to terms and feel comfortable with their systems.

**Planning for Automation**

Contrary to popular belief, automated systems are evolutionary and only sometimes revolutionary in nature. They are only as good as the planning and commitment that goes into them, and, once the systems are in place, they immediately become subject to concerns of obsolescence and upgrade requirements.

Planning is one of the most crucial aspects of the whole automation process, and poor planning will hinder a system long after it has been implemented, sometimes necessitating redesigning the entire system. Unfortunately, planning for automation is something at which many archivists are not adept since they have little or no formal management or administrative training; they are inexperienced in automation and unaccustomed to devising a long-term or flexible budget, writing grant proposals, or working with vendor contracts. They may also succumb to making whimsical or casual decisions—engendered by "go with the..."
Development of Automated Archival Systems

herd" and "let's get it because it's there" syndromes—without sufficiently determining local requirements and objectives.

SAA Council recognized an overall deficiency in the profession in the area of planning skills, and in 1981 it established a task force to "formulate a major initiative in planning for the profession." The present task force was appointed in 1982, and in 1986 it published its report. The report covers every aspect of planning for the profession. It recognizes that automation sometimes overshadows and distorts other important archival functions and management issues because of its technological and somewhat glamorous aura. In the report, therefore, automation is placed in its rightful context; it is seen not as an end in itself, but rather as a tool with conceptual implications which might change the entire direction of the profession. It is worthwhile, therefore, to note here some of the findings of the report, since general attitudes toward planning will inevitably reflect on automation as one specific way in which professional goals can be achieved.

Among the basic assumptions underlying the report and relevant to the argument of this paper are:

1. That archival activity is under-funded and must receive greater support from outside the profession. For this, public awareness of the importance of archival records must increase.
2. The profession must make greater use of a few broad strategies: planning, cooperation and mutual assistance, research and development, and advocacy and public information programs. In addition, archivists must give more attention to better methods for obtaining and managing resources.
3. The responsibility of archivists is not restricted to their own repositories but includes working with other individuals and programs to improve the process by which automated records are selected, preserved, and used.

Bearing these assumptions in mind, it is clear that planning for automation is a wide-ranging and continuous process which should not end with the acquisition and/or implementation of a particular system. Nevertheless, a start has to be made somewhere, and Kesner, in his book, Automation for Archivists and Records Managers: Planning and Implementation Strategies, suggests that a planning team be established. At its smallest, this team would have representation in the form of an in-house professional archivist, a technical specialist (this might be a member of the parent institution's electronic or administrative data processing department or a microcomputer vendor), and a user (ideally,
both clerical staff and patrons should be represented). A larger team might also include representatives from different areas within the archives, and outside consultants or specialists. There also might be representation from the administration of the parent institution, a tactical move to gain the involvement and commitment of management.

Obviously, the size and composition of such a team should be suited to local circumstances. Sometimes an overly large and diversified team can be more of a hindrance than a help (as is the hierarchy of systems committees used by many libraries). Since they have a tendency to become too slow and too political, thus hampering the librarian or archivist in future developments, in responding to unanticipated situations, or in effecting relatively small, easily achieved system enhancements. From the world of Management Information Systems (MIS), Jerome Kanter writes of the results of a survey of top executives about the development of MIS: the survey showed that a top priority was the formation of an “Executive Steering Committee” of managers from the different functional areas of the organization that would be served by MIS. The committee would set criteria and priorities for allocating resources and for deciding upon the order of implementation using a modular approach to systems development.

The Executive Steering Committee (the word “steering” is important because it represents an ongoing process, rather than an investigatory committee or task force) would produce a written overall plan for systems development, covering all the major functional areas and clarifying the interrelationships between applications. It would also work to ensure that top management made a long-term commitment to provide stable funding for system development and enhancement.

During the initial stages of planning for an automated system, the archive (or the team or steering committee, if one exists) must look at the whole range of activities and functions of the archive, and from these, target those which could or should be automated. This is necessary, since from these observations a primary list can be prepared of the capabilities that are required of a prospective system, as well as a secondary list of capabilities that are desirable for a system to have now or to add in the future. The planning process should also establish specific time and budget requirements and take into account other resource requirements—such as subscriptions to bibliographic utilities, network access fees, equipment maintenance, retrospective conversion of existing manual data, and staff training.
Before selecting hardware and software, planners must also determine the technical specifications required and whether any existing local resources can be used. The specifications include computer storage and processing capacity, indexing and sorting capabilities, compatibility and networking requirements (either now or in the future), upgrading, length of records and fields, and format. These will determine the size of computer required and the compatibility of its operating system. In past developments, in academic settings in particular, archives have been able to utilize their institutions' administrative data processing resources such as computing facilities and consultant programmers. This may not, however, be a viable option for many smaller institutions.

Another factor to consider is the level and means of support, both for fixing problems, and for installing upgrades and other system enhancements. The archives must also decide which descriptive standards to use, either in-house or MARC, or some combination of the two. This may require simultaneous development of an in-house thesaurus of subject headings and a local name authority file, or the purchase of such authority data from another vendor, either online, or in hard copy.  

Intelligible, relevant product and system reviews and evaluations are sometimes difficult to locate, and archivists—especially those with limited technical expertise—must be careful not to be at the mercy of vendors. Archivists should seek out product evaluations in archival, library, information science, and business literature, since these are likely to be the most relevant and the most comprehensible. Recently, a very helpful section was included in the *Midwestern Archivist*, written by people actually using the systems and discussing software applications in their archives.  

There are now some journals specifically devoted to this area, for example, *Archival Informatics Newsletter*, *Automated Data Processing in Archives (ADPA)*, and *Small Computers in Libraries*. The SAA Clearinghouse on archival automation, under the guidance of the Program Officer, is also a source of information on actual automated applications.

In order to avoid getting stuck with a bad contract or bankrupt vendor, most institutions seeking to install a major turnkey system develop a profile of their requirements for a system and send out requests for proposals to would-be bidders. From the bids received, they balance the least expensive bid against the most promising systems package. The institution then negotiates a carefully constructed contract with one or more parties. The contract specifies exactly when
monies are to be paid, dates by which specific phases of the project should be completed, the capabilities that will be in operation at those times and those that may be implemented in the future, what hardware and software support will be supplied, and the conditions for staff training and systems development. There are penalty clauses for vendors that fall behind on deadlines or systems that fail to perform in the agreed manner.

The contract, however, also imposes a large financial burden upon the vendor in terms of capital outlay and cash flow since he must wait until successful implementation for final payment. This has resulted in many information system vendors going bankrupt. One company that has been particularly active in turnkey operations in archives has been the Toronto-based company, Geac, which developed the Smithsonian Institution and the Bibliotheque Nationale archival subsystems as components of institution-wide information systems.

The method of selecting an automated archival system naturally should be scaled to the budget and the objectives of the archives. Whether opting for a turnkey, or a locally devised mainframe or microcomputer system, the solidity of the investment is crucial to the (generally limited) resources available. Planners should discuss hardware needs and capabilities with local systems personnel and vendors; but to do this archivists may need to become familiar with some of the technical jargon to ensure that their needs are understood. They should also visit as many archival sites as possible where the vendor has installed the same system as the one being considered. Since administrative users at the site or vendors may not be completely objective in their comments, archivists should ask to see demonstrations of all the functions in which they are interested and, if possible, talk to some of the patrons using the system.

Once a system has been selected, whether it is software, hardware, or a mixture of both, if it is not vendor or institution supported, it will need to be installed. This is usually the case for microcomputer-based systems, and installation is not very difficult, even for those with limited technical computer skills. Michigan State University's MicroMARC:amc, in particular, comes with excellent documentation. The archivist may need some moral support, however, and this is a critical time to build personnel confidence in the new system. Rather than delaying installation, or floundering around—becoming more and more nervous and reluctant—archival staff should seek help from other more experienced archivists, library or office automation colleagues, or the vendor of the computer hardware and/or software.
Budgeting for Automation

Budgeting is a difficult problem for almost all who plan for, or maintain, automated information systems, but, as is recognized by the Goals and Priorities Task Force Report, it is a particular handicap for archivists, who have traditionally been among the lowest and most casually funded components of an organization. In addition to suffering from fiscal neglect, many archives contend with a poor public image and suffer a lack of technological expertise; these factors make obtaining the necessary additional funding even more difficult. In fact, the notion of technology being present in archives, or of the changing role of archives—from custodians of paper records to providers of information—actually conflicts with the way that archives are seen by many funders, theorists, and researchers.

Coming to grips with funding for automation will be essential for the many archives that will be brought into automation by the new microcomputers and software. Capital grants are available from Federal organizations such as the National Endowment for the Humanities and the National Historical Publications and Records Commission as well as from corporate sponsors. These grants require a comprehensive project proposal and/or skillful solicitation, as well as regular status reports should the project be accepted and implemented. Once they are received by the grant agency, proposals are reviewed and judged by many experts—including peer review—for detail, clarity, financial soundness, and technical feasibility. One of the benefits of seeking this sort of financial aid is that it virtually ensures that the initial project is properly planned, thoroughly evaluated, and carried through.

Another crucial point about budgeting is that financial resources will still be required (after a system is installed or a grant is accepted) for all the operational expenses mentioned earlier, and for upgrading and enhancing the system. Both hardware and software age or become obsolete as technology advances, and the more familiar users become with a system, the more sophisticated their demands will be.

Preparing for the Changes Brought by Automation

Automation, either of an existing manual process, or as the introduction of a new process, inevitably means change in an operation. The extent of disruption it causes, and the level of acceptance by users, will correlate directly with the amount of careful planning that was put into all of its aspects and implications in advance. Since this issue of Library Trends is looking at the development and impact of automation on
intellectual access in particular, change in this context must be anticipated in systems, methodology, work flow, staffing, personnel relations, financial and physical resources, archives image and profile, and patrons and usage.

There are a number of ways that planners can help to make automation-related change as smooth and acceptable as possible within their archives. As was outlined earlier, archivists should involve all parties in the planning process, explaining why automation is needed and the ways in which it will benefit each of them. Once implementation has begun, they should continue to consult them and keep them informed. Selling an automated system is often as important as all the decisions which go into implementing it—uncooperative or suspicious staff or patrons can cause difficult psychological and political barriers to a system's success. It also may be beneficial to contribute updates for institutional or local publications. This consciousness-raising will both prepare users for the new systems and help build some publicity and a progressive image for the archive.

Archivists should try to anticipate all budget requirements, in the short-term and the long-term; including in the budget the costs to expand memory or processing capacity, and to buy supplies such as printer paper and ribbons, backup disks and tapes, and surge protectors. Shortfalls which slow down or halt implementation, or which require money to be taken from other worthy projects can cause frustration and resentment among staff.

Greenspan and Gilheany, writing about an evolving data management system, argue that "periods of extensive change should not occur simultaneously in both hardware and software procedures;" the changes "should happen in small increments and be spaced out so that the organization can plan for changes, adjust to them, and digest them." This is a good rule of thumb for managing changes in automated systems, for instance from an in-house mainframe system to a turnkey or microcomputer-based MARC system. Similarly, it is sometimes possible to ease the change from manual control and local descriptive practices to automation and MARC description by familiarizing the staff with manual MARC cataloging in advance of full automation, or by entering records into a test database where staff know that their errors are not fatal.

A commitment to develop and adhere to local standards where necessary, and to incorporate national and international standards where available, will result in logical, standardized data that will be
much easier to convert to new or expanded systems later, or to exchange with other bibliographic systems.

Archivists should talk to colleagues, attend professional meetings, and read widely of professional and technical literature in order to learn from the experiences and mistakes of other users and managers of automated information systems. Greenspan and Gilheany also emphasize this point, stating that “knowledge of past successes and failures is probably more important than new technology in assuring successful management of change.”

Finally, archivists should learn to feel comfortable with the idea that automation is never a finite project, nor is a computerized system ever a completed entity, but rather that the processes are constantly developing. Archivists are accustomed to using long-established processes and techniques; however, with automation, the technologies and the descriptive formats are likely to continue to evolve at a rapid pace for the foreseeable future. For instance, just when archivists were starting to come to terms with MARC AMC, serious consideration now is being given to merging all the different MARC formats into one all-encompassing format, and a universal MARC format, UNIMARC, has already been developed to facilitate international data interchange.

Staffing

Implementing automated descriptive processes poses some staffing questions that are new to archivists; included among these are restructuring the work flow and the effect this will have on existing staff and on hiring new employees. Staff inevitably will be affected by the changes in practices and procedures that are brought about by automation, but this should be put to positive effect. Existing staff should be encouraged to learn as much as possible about the system’s potential, and creativity and initiative should be rewarded. This will not only increase the acceptance and rate of implementation, but will also enhance the system and the service thereby provided.

In a paper on training library staff to use new software, Dayall makes the helpful observation that staff cooperation and willingness to learn will be greatest when there is general agreement on the need for a product or service—but the product must meet expectations. About training, Dayall suggests that each person should be made to work on their own on a real project, since people learn best through recovering from their own mistakes; Dayall further indicates that the eventual goal is to make the trainer obsolete.
A colleague of mine observed that his archive had experienced very high staff turnover since the introduction of automation. Many of the staff felt automation had been "imposed" upon them as part of a larger institutional political process, with no attempt being made to explain what was happening, nor to allay staff fears. He wondered if this situation existed in more than one institution—given the fact that many archival staff members come from academic backgrounds (e.g., history) that are traditionally resistant to change and unused to computers. The issue of staff turnover and the acceptance of automation has not been addressed in any detail by professional archival literature, but it has been extensively treated in other technical literature and certain approaches are commonly suggested.

If staff are not computer-literate or are hostile toward the technology, try to win them over in advance. Encourage them to use word processing software for the many laborious and routine daily typing tasks performed in an archive; the preparing and revising of inventories will show them the immediate benefits of a computer. Starting on a microcomputer is often less intimidating than a mainframe terminal since it is self-contained. If an archive is a part of, or close to, an institution that has an online public access catalog, staff may want to use that to become familiar with the general concepts of information retrieval and supplying computer-assisted reference information to patrons. If a MARC-based system is planned, access to a cataloging department's OCLC terminal or that of any other bibliographic utility can help demonstrate to staff unfamiliar with MARC records the way in which formats work and why coding is necessary. Acceptance and learning rates will vary between individuals, but with the introduction of the system, archivists should ensure that comprehensive, intelligible documentation and ample training opportunities are available. Training should be aimed at different levels, from beginning to advanced, and can be obtained from vendors, professional meetings (national, regional, and local), and in-house programs. Continuity in staffing also should be a goal since the investment in time and money is wasted if high staff turnover persists; however, the experiences of some university archives have shown that student employees can be successfully trained to code and enter data in MARC and other formats on a more temporary basis.

Regarding new staff, some archives may be large enough to justify hiring an archivist with expertise and specific responsibility for automated systems (that is, installation, implementation, training, networking, maintenance, and upgrading). Similar positions have been created
Development of Automated Archival Systems

in libraries dedicated to systems development personnel. This may seem like an ideal way to ensure that a system continues to be developed and maintained, but three significant problems should be anticipated. Finding an experienced archivist who also has the technical background may be difficult. In libraries, many systems positions are being filled with recent graduates of master's programs in library and information science; often they have extensive coursework in this area. If these graduates are employed in archives, salaries may become an issue. It may be necessary to offer a position with the same financial inducements as those offered by an equivalent library position—a difficult decision when many archival salary scales are established at a lower rate and filled with more seasoned archival staff. And finally, the management structure should be clearly established. Determine, in advance, how to fit a systems person into the reporting structure and give them enough authority to allow them to carry out their work successfully—particularly in the areas of long-range planning, budgeting, and networking. Avoid disrupting the existing management structure too much, and thus risk putting that person in an unworkable personnel situation.

Users

Users are increasingly acclimatized to automated systems and the provision of electronic information, and consequently their expectations of the capabilities of these systems are also increasing. Staff must be trained to anticipate and cope with increased and/or changed user and donor populations, and new user demands and expectations, and they also need to be aware of the inevitable biases and limitations of a computerized reference system. All staff should know how to use the archival databases or subsystems (although not necessarily the details about how these work), and be able to train users on the system. Staff should also be able to answer simple reference questions and locate and understand descriptive data.

As more archives make access to their descriptive data publicly available, either through terminals in the archives or abbreviated records displayed in an OPAC, the way in which the reference archivist functions will probably change. More than likely, the automated systems will be able to answer many basic reference questions and to indicate to a researcher something of the extent of an archive's holdings. For more detailed information, however, the reference archivist will
still have to intervene and help the researcher to develop a more sophisticated search strategy and to use the actual materials.

Many researchers today are looking for increased subject access from automated systems, and a way to generate their own, or what Neufeld and Cornog call "hybrid" files. Such files would be created by the researcher from searches performed horizontally and vertically through record groups in a single archival database, or through the electronic merging of primary and secondary sources in multiple databases. The development of transparent "gateways" to other databases would facilitate this cross-fertilization and merging of database contents. These files could then be stored for as long as they were needed by the researcher in a separate database on the archival system. Some archivists argue that this form of research actually allows the researcher to come closer to the way that archival records were originally created than does their arrangement by provenance.

If this trend does indeed develop, the design and functions of archival databases increasingly will be more influenced by the access that users want and their research patterns, and less by traditional principles of archival arrangement. This holds true for administrative users as well as researchers and casual patrons. Rowlett notes that: "User selection will determine those species [of information systems] which best suit each environment and can adapt to that environment as it also changes." Although archival materials are generally unique to any repository, archivists must consider, when deciding how much to cater to their users, that information has become a commodity, and that there are many other sources of electronic information competing for user attention. While fee-based systems do not yet pose as much of a threat to the survival of archives as they do to some library services, they may readily provide—through at-home computer terminals—at least some of the information that users require. Studies of types of users and their research patterns, and an openness to suggestions about additional access points, are the only ways that archivists can effectively gauge how well they are meeting their users’ needs and how they can continue to enhance the service that they provide. As automated access systems develop, such studies will become essential tools for the archivist as a manager and planner.

The SAA Task Force on Goals and Priorities prioritized the use of automated databases and networks and encouraged wider external use of records by developing and linking "manual and automated databases about archival holdings on institutional, regional, national, and international levels." More specifically, it suggested that in order
Development of Automated Archival Systems

To encourage the use of records of enduring value, the archival community must play a greater role in providing users with information about the materials in repositories. Many manual and automated databases have developed or are developing independently; often these have similar or identical descriptive information. Possibilities for linking these systems to increase public use and to eliminate costly duplication of effort need to be investigated.\textsuperscript{38}

Links with systems such as RLIN and OCLC, as well as with local OPACs, will inevitably encourage new and nontraditional users as well as increasing the numbers of "absentee" patrons—those who communicate by mail, telephone, or electronically. In some cases, these users will be invisible, since they will be gleaning information from the larger bibliographic databases rather than through the local archival system. This means both contextual (local, national, and international) and conceptual (increased concentration on the informational content rather than the media) changes in usage. It also means, as Hensen has stated, that the descriptive practices of an archive are put in the public view and, therefore, archivists must be even more scrupulous in the accuracy and comprehensiveness of their data.\textsuperscript{39}

Participation in such systems will inevitably lead to more integration of archivists with other information professionals, and concomitantly, will give them an increased voice in the development of standards and the construction of more comprehensive systems.

FUTURE DEVELOPMENTS

Archival automation has moved very rapidly to reach where it is today. Information technology, however, is moving even faster. The Linked Systems Project (LSP), involving RLIN, OCLC, WLN, and the Library of Congress, has worked to establish a common computer-to-computer protocol whereby records from any of these bibliographic utilities may be exchanged, and which eventually will make any record entered in any of these systems nationally and internationally available.\textsuperscript{40} The Library of Congress has been investigating the potential of video discs as an interactive conservation medium for more than two years, and the National Archives has been looking into developments in voice and pattern recognition, digital raster scanning, and optical character recognition (OCR). Information scientists are researching the development of intelligent catalogs which would use artificial intelligence to determine which sources from a variety of databases and
ANNE GILLILAND

formats would meet the user's information needs, and these catalogs would be the next step after OPACs.

The effect these developments will have upon most archives is yet to be seen, but as planners of automation, archivists must be able to anticipate and evaluate the changes in technological capabilities and in staff and user needs, in order to develop their systems in the most efficient and effective ways.

References

1. See Hensen's article in this issue for a more detailed comparison of the Manuscripts Format and the Archival and Manuscripts Format.


4. A good example is PARADIGM, the system devised by the University Archives at the University of Illinois at Urbana-Champaign which was first developed in 1971 and is still in operation today. PARADIGM, resident on an administrative mainframe, was programmed by the university's administrative data processing services and was initially designed to run in a batch, rather than an online, environment. The system, which went online in 1976, contains both control and administrative data in linked databases and can generate accession, shelf and subject descriptor lists, as well as subject indexes. See Brichford, Maynard. The Extension of Intellectual Control through Subject and Name Access to the Archives of the American Library Association: Final Performance Report to the National Endowment for the Humanities (on Grant No. RC-24935-76-1198). Urbana-Champaign: University of Illinois, University Archives, 1979.

5. Engst, Elaine D. Standard Elements for the Description of Archives and Manuscript Collections: A Report to the SAA Task Force on National Information Systems. Ithaca, N.Y.: Department of Manuscripts and University Archives, Cornell University Libraries, 1980. Engst reported her findings of common descriptive data elements in use throughout many different archives surveyed. These were subsequently published in 1982 by the Society of American Archivists as the SAA NISTF Data Element Dictionary.

Development of Automated Archival Systems


11. Ibid.

12. Ibid., p. 4.


15. Ibid.


17. See Cloud's article in this issue of Library Trends for further discussion of retrospective conversion costs.

18. For MARC AMC cataloging, copies of the Library of Congress Name Authority Files (LCNA) are required. There are also various commercially available thesauri of subject headings for specialized areas.


23. Ibid.

24. This approach was taken by Stanford University Archives for a year prior to commencing the RLIN RECON project.

25. This was tried at the University of Cincinnati Archives and Rare Books Department, where the special educational module of MicroMARC:amc was used by students of an archival administration course as a pilot database prior to full implementation of the software package.

26. Encouraging discussion of mistakes is an interesting idea which was attempted by a Data Processing Clinic at the University of Illinois at Urbana-Champaign some years ago. Soliciting information about mistakes or failures, however, is not always an easy task.


30. Students have been successfully trained at both Michigan State University Archives and the University of Cincinnati Archives and Rare Books Department to code and input MARC AMC data with only a minimum of professional supervision required to check the coding prior to data entry.

WINTER 1988 535

32. See Kesner, Automation for Archivists, p. viii.

33. Hensen, Steven L. SAA MARC AMC Workshop, 11-12 July 1987, Cincinnati; and in a paper entitled "Non-Neutrality of Information Technology," delivered at the ASIS Mid-Year Meeting in Cincinnati in 1987, Thomas Froelich of Syracuse University argued that the intrinsic features of an information system such as design, limitations on capabilities, and modes of production, as well as accidental features, streamlining, and simplification procedures, and technological and cultural paradigms build inherent biases and restrictions into the way in which an automated system stores and retrieves information compared to a manual system.


35. For an overview of design requirements for transparent information retrieval see Williams, Martha E. "Transparent Information Systems Through Gateways, Front Ends, Intermediaries, and Interfaces." JASIS 37(July 1986):204-14.

36. See Neufeld, and Cornog, “Database History.”


38. Ibid.


Additional References


Development of Automated Archival Systems


Squaring the Circle: The Reformation of Archival Description in AACR2

STEVEN L. HENSEN

In the aura of excitement which surrounds the MARC AMC format today, it is sometimes difficult to remember that little more than five years ago automation of almost any sort represented terra incognita for most archivists. The bibliographic utilities, developed by the library community to take advantage of the cost efficiencies inherent in shared cataloging, did not encourage archival participation since there was no obvious pecuniary or other advantage to carrying catalog records of unique materials. This presented no problem to most archivists, who saw the bibliographic systems as focused rather too sharply on library-based bibliographic description to meet what they considered to be their own unique descriptive needs. Thus, except for some rather singular early use of the Online Computer Library Center (OCLC), there were neither archival records, nor place for such records, in these systems.

Today, however, with almost 150,000 catalog records for manuscript and archival materials in the bibliographic networks of both the Research Libraries Group (RLG) and OCLC; with the National Union Catalog of Manuscript Collections (NUCMC) poised to enter RLIN; and with the dozens of cataloging and retrospective conversion projects currently plugged into these and other systems, the situation described above has been radically reversed. Moreover, it is now fully recognized by both librarians and archivists alike that the inclusion of manuscript and archival records is a perfectly natural extension of the research utility of these networks. Systems that carry records for books and serials

Steven L. Hensen is Assistant Curator for Technical Services, Manuscript Department, Duke University Library, Durham, North Carolina.

WINTER 1988
as well as "nonbook" materials, such as prints, photographs, maps, music, videotapes, motion pictures, and machine-readable records, are incomplete research tools without the inclusion of records for manuscripts and archives.

The two principal obstacles to making the quantum jump from reluctance to acceptance were the lack of a MARC-compatible format that fully met the needs of archival description, and conversely, the lack of a system of archival description that was truly MARC-compatible. The relationship of these problems to each other, while obvious now, was not always so apparent. Thus, their solutions were arrived at quite separately and were more a result of fortuitous coincidence than coordinated activity.

When the Society of American Archivists (SAA) and the Library of Congress (LC) issued the MARC Format for Archives and Manuscripts Control (AMC) in 1983 after five years of work by the Society's National Information System Task Force (NISTF), a solution to the problem of a MARC-compatible format was apparently finally in hand. Among the many things this format demonstrated was that archivists and librarians had more in common with each other than anyone had believed, and that a library-based descriptive format, indeed, could be adapted to fully support archival description. Considering the historical mistrust between the archival and library communities, it was perhaps even more ironic that the solution to the problems surrounding archival descriptive standards was also precipitated by events in the library world. The publication in 1978 of the second edition of the Anglo-American Cataloguing Rules (AACR2) initially, and not surprisingly, caught most archivists completely unaware. Eventually, however, it came to have increasing significance as it forced archivists to come to grips with long-neglected questions relating to cataloging and descriptive standards. Thus these rules came to play an important (albeit somewhat indirect and unwitting) role in preparing archivists for their initiation into the world of automated bibliographic networks by focusing their attention more sharply on descriptive standards. Just as NISTF adapted library-oriented MARC tags to meet archival needs, so too was AACR2 adapted to support archival description in a more useful manner. The publication in 1983 of Archives, Personal Papers and Manuscripts (or APPM as it is now known in MARC cataloging source code) was an attempt to address the problems found in AACR2.

To better understand how this came about, some historical perspective may be helpful. In the fall of 1977, members of the staff of the Manuscript Division of the Library of Congress were first presented
with a draft of the chapter on manuscripts for the revision of the first edition of *Anglo-American Cataloguing Rules.* The general response to that draft was not positive. The objections were based largely on the fact that the new rules seemed to ignore standards that had been established in chapter 10 of the original cataloging code (now known as AACR1) for the cataloging of manuscript materials; these standards were the basis of the cataloging practices of both the Manuscript Division and NUCMC. It was very much felt that agreements and understandings about the unique cataloging requirements of manuscripts, as distinct from books, had been lost or overlooked. In response to the revisions, a memorandum from the Chief of the Manuscript Division to the Chief of the Descriptive Cataloging Division outlined a number of specific objections to the proposed rules. At the same time, it was pointed out that the revisions had never been properly circulated in the Manuscript Division for advice and/or comment before they were presented, essentially as a *fait accompli.* In fact, there was no immediate evidence that anyone in the American manuscript community had anything at all to do with the proposed rules; therefore, it was recommended that approval of the chapter be withdrawn until real revision could occur.

Subsequent discussion on this matter between staff members of the Manuscript Division and the Descriptive Cataloging Division did not result in suppressing the chapter, as the editorial process was by that time too far along to permit that. However, it was suggested that an alternate set of rules be drafted to be used as a point of departure for discussion and possible future revision of the rules. This was done and a new set of rules—essentially a revision and expansion of chapter 10 of AACR1—was approved in the Manuscript Division and circulated for comment. Apart from the Head of the Manuscripts Section of the Descriptive Cataloging Division (which produced NUCMC), no reaction was received, and there the matter rested for some time.

Meanwhile, the actual publication of AACR2 evoked a general national reaction of disappointment to its provisions for manuscripts and other special, "nonbook" materials. Acting under the auspices of the Council of National Library and Information Associations, a group of special-materials catalogers convened as the Joint Committee on AACR2 (later renamed the Joint Committee on Specialized Cataloging). This group had several meetings in the fall and winter of 1979/80 to discuss problems of AACR2 compatibility with the needs of special-materials libraries. They eventually concluded that several chapters in AACR2 needed extensive modification in order to make them useful,
and that a grant from the National Endowment for the Humanities (NEH) should be sought to help support this work.

At the same time, and somewhat independent of this group’s activities, the Library of Congress was gradually becoming convinced that some of the special-materials chapters in AACR2 were indeed inadequate for the cataloging needs of some of its custodial divisions, and that manuals supplementing and clarifying the rules should be prepared. In fact, the library was already fully cooperating with outside groups in preparing interpretive manuals based on AACR2 for rare books and for cartographic materials.

In June of 1980, the Joint Committee on Specialized Cataloging was successful in obtaining a grant from NEH to assist in the preparation of AACR2-based cataloging manuals for the three areas considered most in need of immediate and drastic attention: manuscripts, graphic materials, and motion pictures. The agreement between the Library of Congress (in particular, the Processing and Research Services Departments) and the joint committee was that the first draft of these manuals would be prepared by members of the LC staff in the respective custodial divisions having responsibility for these materials. It was not altogether coincidental that there were members of the joint committee in each of the three divisions.4

Under this grant, initial drafts were prepared by the designated LC staff members, and, after internal review in the library, these drafts were circulated nationally and internationally among concerned professionals for comment and reaction. Revised drafts based on these comments were then prepared and editorial committees were convened for final editing. The result was the publication of APPM.

All of these projects approached the task of writing the manuals with two basic premises: first, that the respective chapters in AACR2 on description (chapter 4: Manuscripts; chapter 7: Motion Pictures and Video Recordings; chapter 8: Graphic Materials) failed to comprehend in some important way the essential “bibliographic” nature of the material and thus provided inadequate prescriptions for its description; and second, that any revisions were nevertheless obliged to adhere to the basic thrust and structure of the whole of AACR2—most particularly insofar as that structure reflected International Standard Bibliographic Description (ISBD) standards—so that bibliographic records created under these revisions would be compatible with other AACR2-based description.
Reformation of Archival Description

The Requirements of Archival Description

It is often asked why archivists should care about library cataloging rules. While the basic answer lies in the premise of bibliographic integration, as noted earlier, there is an underlying, more fundamental question of who should be responsible for archival cataloging rules. For too long, archivists simply ignored the question of descriptive standards, preferring local idiosyncratic solutions to any hint of externally imposed standards. Into this vacuum stepped creators and formulators of rules who were more oriented to library cataloging than to archival description. Thus, when AACR2 was published, it should have come as no surprise that the rules did not reflect the needs of archival description.

If the overall approach in APPM to the revisions and expansions of chapter 4 of ACCRZ could be summed up in a single sentence, it would be: "Manuscripts are not books!" Virtually every specific problem in chapter 4 related to a failure to distinguish sufficiently between the bibliographic nature and requirements of published and unpublished materials. This was, in turn, related to some general misunderstandings regarding the nature of archival description. These were reflected most particularly in the failure to place the proper emphasis on the needs of collection or series level description, or to recognize that archival description was not "static" in the same way that bibliographic description was. These problems were present to varying degrees in both Part I (Description) and Part II (Headings) of AACR2.

It is ironic that the manuscript materials of the sort traditionally collected by libraries as "primary" sources were not deliberately created to be used as such. The letters, diaries, account books, scrapbooks, and other papers that normally make up such collections were originally written with more quotidian purposes in mind. It is only insofar as these materials provide a record of major and minor historical events that they assume value and interest as tools of research. In order to provide access to this research potential, the manuscripts must be assigned a bibliographic identity. With published materials this identity is \textit{prima facie}, deliberate, and straightforward, with most of the data that defines this identity provided clearly and explicitly, usually on the title page. With unpublished materials, however, this identity must be created through a process of formulating and extracting the elements of bibliographic description from the content and context of the manuscripts.

When AACR2 instructs book catalogers to rely on the title page of a book as the "chief source of information" for cataloging data, it is
pointing to the major source of bibliographic identity for that work. However, when the instructions in chapter 4 tell manuscript catalogers that the "chief source of information for a manuscript text is the manuscript itself" and to prefer within the manuscript "information found on a title page, in the colophon...and lastly the text itself," there is inevitably some confusion. While the instructions imply that there will be such elements as title pages, and that they will contain bibliographic data, this is rarely the case. The instructions that follow requiring that all "information taken from outside the prescribed source(s) [be enclosed] with square brackets," would, if followed strictly, yield a catalog record in which most, if not all, of the data would be bracketed; in most cases not only would there be no information in the prescribed sources, but there would be no prescribed sources. One practitioner has observed that cataloging records created under such requirements would appear to be surrounded by picket fences through which one would have to peer as if into a concealed garden.

Even though the cluttering of manuscript catalog records with excessive and needless bracketing is largely an aesthetic problem, the underlying lack of understanding reflected in these prescriptions regarding the nature of modern manuscript collections is of more far-reaching concern. Instructions to use sources of information for cataloging manuscripts that are not likely to exist is obviously not helpful. It appears that the framers of AACR2 offered these rules as part of an overall parallel structure, wherein general principles established for cataloging library materials are uniformly applied to all materials regardless of format. Thus, principles for extracting (or, more exactly, transcribing) cataloging data from publication details on title pages of printed works were unfortunately extended to materials that have neither title pages nor publication details.

This is not to say, of course, that there is no legitimate source for cataloging data for manuscripts, only that AACR2 failed to comprehend or acknowledge what that source might be. Archivists and manuscript curators have always understood, implicitly at least, that some sort of "bibliographic" identity needed to be created for the materials in their custody (although they almost certainly would not have recognized it in those terms). They cataloged and identified their materials through the preparation of archival finding aids such as inventories, registers, and guides. Whatever particular form these finding aids took, and in spite of their various local differences, nevertheless they nearly always contained similar categories of information regarding the crea-
Reformation of Archival Description

tor, nature, source, extent, and so on, of the manuscript collection or record series.

It is probably not altogether coincidental that the various elements of description found in archival inventories had certain parallels with some of the elements of library description. It was only necessary to recognize these similarities and to declare the primacy of these finding aids as legitimate sources of cataloging data. Thus when APPM states that "these finding aids are approached by users as a surrogate for the whole collection... [and] are, in effect the only practical equivalent to a chief source of information," it is acknowledging that the creation of these guides during archival processing is analogous to the gathering of publication details on the title page of a book. It also acknowledges that, for the purposes of cataloging, these finding aids are as reliable and concrete a source of information on descriptive elements such as title, dates, and extent, as the title page of any book. Furthermore, this puts in proper perspective the pivotal role that these finding aids have in the archival description process, in which the cataloging is almost always derived from, and dependent on, the fuller detail they contain.

Related to the primacy of these guides is the importance of collection and series level cataloging. Anyone who has experience with modern manuscript collections knows that it is a rare letter, document, or diary in a collection that is so important that it overshadows the collection as a whole. Even if individual items in a collection deserve special description, this would never be done at the expense of the description of the whole. Most "items" in manuscript collections normally only derive significance from the context they occupy in the entire collection. Simply because individual letters in a manuscript collection may have some sort of topical or autograph interest, it is a mistake to assume that this is the proper level at which to catalog all manuscripts.

Archival records, certainly, and most manuscript collections, are generated or created as a mass of papers which collectively document the activities or lives of some organization or person. This mass has a kind of organic unity which traditionally has ordered all archival description. Unfortunately, chapter 4 of AACR2 fails to recognize this principle. While providing some general guidelines for collection level description (which are insufficient and incomplete), nowhere is there an explicit acknowledgment of the importance of the collection or series level approach. Furthermore, most of the elements of description given in the chapter, together with their supporting examples, are specifically
oriented to the description of individual manuscripts rather than to collections.

Related to differences in the fundamental philosophical and theoretical underpinnings of bibliographical and archival description is another element of the conflict—the so-called “Paris Principles.” These principles, forming the very foundation of modern bibliographic description upon which AACR2 is based, establish the library catalog as an instrument of bibliographic description in which the functions of the catalog are defined purely in terms of “ascertaining whether the library contains a particular book specified by (a) its author and title, or (b) if the author is not named in the book, its title alone, or (c) if the author and title are inappropriate or insufficient for identification, a suitable substitute for the title; and (a) which works by a particular author, and (b) which editions of a particular work are in the library.” Such an approach, of necessity, places more emphasis on physical characteristics and title page information than on intellectual aspects and content. The impetus behind this was an altogether laudable and understandable desire on the part of the international library and publishing communities to remove cataloging from the realm of the analytical and subjective and to establish it once and for all as a fundamentally practical discipline. An extension of this focus on physical aspects was a catalog record prepared on the “perfect copy” approach from which any institution holding that item could then derive its own catalog record. This provided the basis for all subsequent programs of shared and cooperative cataloging.

Unfortunately, the Paris Principles contain instructions (in the general “Statement of Principles”) that “the word ‘book’ should be taken to include other library materials having similar characteristics.” Thus, by mistakenly assuming that manuscripts have characteristics similar to books, these particular principles are thrown into conflict with the fundamental realities of manuscript and archival cataloging. The basic library concepts of author and title have essentially no meaning in the archival context. The “authors” of manuscript collections and archival records are significant as indicators of the origin or focus of the materials, but this relates more to archival notions of provenance than to the rather more deliberate creative responsibility of authors of books. The “titles” of most manuscript collections usually consist of cataloger-supplied titles based on form or content, and as such, are often utterly without bibliographic significance—for example, “Papers,” “Records,” “Diaries.” Furthermore, beyond questions of sheer extent and preservation, the physical characteristics such as height
Reformation of Archival Description

and number of pages of manuscript materials are generally of little interest to either their custodians or their users. Consequently, the cataloging of these materials traditionally has been chiefly a matter of providing intellectual context and access, that is, the catalog functions as a very distinct tool of reference. Add to these considerations the fact that cooperative "perfect copy" cataloging cannot be applied to the unique, "only copy" nature of manuscripts and archives. Therefore, it is not surprising that catalogers of manuscript and archival materials, knowing something of the Paris Principles, would be suspicious of the utility of AACR2.

Considering the nearly complete and utter alienation between the foundations of manuscript and library cataloging that was just described, it is fortunate that most of these conflicts ultimately proved to be more theoretical than real. In actual practice, reconciliation was achieved on the one hand by providing more emphasis and detail in those areas of description relating to content and analysis (principally the notes), and on the other hand, by deemphasizing or redefining those areas that were less pertinent to manuscript and archival description. For example, chapter 4 of AACR2 provides for seventeen different note areas. Of these, nine were considered to be either irrelevant or too item-focused to be of real use to most modern manuscript catalogers, or were, in fact, actually parts of other notes. APPM, however, provides for sixteen note fields, relating more directly to traditional archival descriptive needs and including notes for "Relationship Complexity," "Biographical/Historical" information, and "Provenance" which meet genuine archival concerns not touched on at all in AACR2.12

An area of description that perhaps best exemplifies the tension between archival realities and the demands of AACR2 is in the "Title and Statement of Responsibility Area."13 There is nothing more central to library-based bibliographic description than the title of the work that is being cataloged. Authors can be absent, obscure, or nonexistent and physical description can be inexact or undetermined, but without a title, there is no catalog record. This, no doubt, explains why the title page is the principal focus of all library cataloging. However, as stressed previously, there is nothing quite so foreign to the world of manuscript collections and archival record series as title pages and formal "Titles proper." Thus it was particularly important that the instructions in APPM for recording and, more importantly, supplying titles be made as clear and as consistent with archival perceptions as possible. Traditionally, archivists refer to their collections by descriptive names such as the "Felix Frankfurter Papers" or the "National Urban League Records."
Since they are unused to making author-title distinctions, it is clear that these "titles" are really creations based on a combination of "author" and supplied title. The cataloging done by NUCMC as well as the instructions in chapter 10 of AACR1, made it clear that assigned titles based on the form of the materials (for example, "Papers," "Records," "Letters," "Diaries") were acceptable for use in the title area of the catalog record. This practice assumed that the comprehension of the full title of the material being described required combining the author/main entry and form title.

What was first required in APPM was a legitimation of assigned titles. Making the archival finding aid the "Chief Source of Information" was the most important step in this regard. This not only removed the title from the ignominy of the brackets, but also restored the finding aid to its proper place in the descriptive process. Second, instructions needed to be supplied for the formulation of assigned titles. The actual assignment and definition of the various archival forms used as titles was something with which most archivists were familiar. It was essential that these procedures be recognized and defined as part of the formal title-supplying process.

Establishing the date as an integral component of the title was perhaps equally critical. To be sure, chapter 4 of AACR2 permitted the addition of date-of-writing to certain kinds of supplied titles, although the inclusion of a date to all titles was not uniformly recommended or illustrated; by also providing a separate date area, the role of dates as a part of the title became somewhat ambiguous. This was particularly true since, on examining the parallel sections in the other chapters of AACR2, it became clear that this area was structurally a part of the "Publication, Distribution, etc., Area," technically making the date area offered in chapter 4 function as a date of publication. Since manuscripts per se do not have publication dates, it was obviously inappropriate to use this area. It was, therefore, necessary to cancel 4.4 of AACR2 and require the date to be entered as a component of the title.

In the physical description area, it was only necessary to provide archivists a means for recording the size or extent of the collections. The recording of other physical details relating, for example, to type of paper, illustrations, seals, stains, ink, and handwriting, are all related to item-level description—a school of bibliographic analysis that is not consistent with modern archival practice. While physical notations may have some antiquarian and artifactual interest, there is neither the time nor inclination to ferret out such details during the course of archival arrangement and description. Moreover, details of this sort are usually...
Reformation of Archival Description

only of interest to a small group of textual scholars and are largely irrelevant to the concerns of most historical research. Consequently, APPM provided for item-level description of physical details within the structure of the rules, but did so with disclaimers in order to shift undue emphasis away from the physical aspects and more toward content-related elements.18

The Future of Archival Description

While AACR2 offered prescriptions for choice and form of access points and headings in chapters 21-24, there was little information that was pertinent to archivists. Chapter 21 provided guidelines for choosing access points for all library materials, from monographs and serials to such nontraditional formats as art works, liturgical music, sound recordings, and spirit communications. Unfortunately, manuscript and archival materials are not mentioned at all in this chapter. Furthermore, in chapters 22-24, in the rules for forming headings there are many conflicts with standard archival principles and practice. These difficulties are all explained at some length in APPM.19 What APPM does not provide, however—beyond some generally avuncular advice—are useful guidelines for coping with the particular problems presented in these chapters.

At the time APPM was drafted, it was not at all clear that there was, or ever would be, archivally acceptable solutions to the problems represented in these chapters. It was one thing to recast only those chapters on description in AACR2 that involved describing archival materials. It was an altogether more serious matter to tamper with rules that applied to all library materials. After all, the headings and access points provide the common frame of reference in library catalogs for the persons, places, and things, by and about which the materials were created. Without uniform headings, searching through these catalogs would be chaotic. Consequently, there was no attempt to deal substantively with interpretations and expansions of the rules for headings and access points; the hope was that archivists and manuscript catalogers would eventually find ways to cope with these rules through their experience of using them.

Fortunately, for the most part, this has been the case. Even though archivists may not consider the heading “Roosevelt, Franklin D. (Franklin Delano), 1882-1945” to be as straightforward or archivally “pure” as “Roosevelt, Franklin Delano, 1882-1945,” the advantages to being able to integrate archival records into systems using this heading
far outweigh the disadvantages of using headings that are occasionally unsatisfactory. Furthermore, the application of the principle of establishing persons not primarily known as authors from reference sources has been a satisfactory means by which to establish most of the name headings occurring in manuscripts and archival records.

Subsequent rule interpretations and modifications made by the Library of Congress to these chapters in AACR2 have also tempered their effect on archival practice. For example, it is now permissible for archivists to add qualifiers to personal and corporate names, not only to resolve conflicts, but also to provide location, occupation, and other information to help clarify the heading. Thus geographic qualifiers can now be added to corporate name headings of a local or geographically ambiguous character, and phrases like “Carpenter, of Milwaukee” can be added to personal name headings to give a more complete identification to largely unknown individuals. In addition, through their participation in the Library of Congress Name Authority Cooperative Program (NACO), NUCMC is currently adding hundreds of headings to the official Library of Congress name authority file. While these headings are being constructed according to ACCCR2 rules and rule interpretations, this is nevertheless being done with more sympathy for archival principles. Since the name authority file is the ultimate source and authority for name headings used by all catalogers, it is fortunate that these “archival” names are becoming increasingly available for use by manuscript and archival repositories. Moreover, with authority files becoming more interactive with their attendant bibliographic files in automated bibliographic systems, the archival form of many names will still be available through the cross references under the established form.

Experience has shown that, while the problems in the chapters of AACR2 on access points and headings areas are more open to correction than was formerly believed, it is still an area requiring careful negotiation and interpretation. Consequently, the forthcoming revision of APPM will have to carry more specific instructions for choosing and forming access points and headings. Only through the experiences of the many archivists who have successfully navigated RLIN and OCLC to enter AMC records are further revisions possible. What seemed intractable several years ago, is now possible, and the job must be finished.

The general success and acceptance of the APPM rules has been gratifying. The Library of Congress, through both the Office of Descriptive Cataloging Policy and the MARC Standards Office, considers cataloging prepared according to these rules to be essentially AACR2
Reformation of Archival Description
cataloging. In addition, both of the major bibliographic utilities consider APPM the standard to be used for bibliographic description of manuscript materials. It is hoped that in the future an even broader base of acceptance can be established through improved communication and cooperation between the Society of American Archivists and the American Library Association (ALA). In particular, archival representation on the ALA’s Committee on Cataloging: Description and Access (CC:DA), and the Rare Books and Manuscripts Section of the Association of College and Research Libraries would do much to ensure uniformity of practice in areas of mutual interest. Both of these groups should be natural partners on questions of cataloging code revision and descriptive standards for manuscript material.

Conclusion

Considering the many fundamental differences between archives and libraries and between bibliographic and archival description, it is difficult not to wonder why archivists would willingly subject themselves to the bibliographic angst of reconciling their practices with AACR2. After all, in many respects it would have been so much easier for archivists to ignore it all and continue to go their blissfully separate ways. However, the pressures and dawning realizations of the “information age” made this position increasingly untenable. The mistake all along was to assume that the common element in archival materials and books lay in their form—that is, “words on pages.” However, archives and manuscripts are not basically bibliographic in nature and it was not until it was realized that the similarities between published and unpublished materials lay in their features as tools of information and research, that the benefits of their natural alliance could be exploited. The presence of tens of thousands of APPM/AMC cataloging records in the bibliographic networks is testimony to the truth of that alliance.

References

STEVEN HENSEN

4. These individuals included: Elisabeth Betz, Prints and Photographs Division; Wendy White and Harriet Harrison, Motion Picture, Broadcasting, and Recorded Sound Division; and Steven Hensen, Manuscript Division.

5. ALA, Anglo-American Cataloguing Rules, 2d ed., 4.0B1, p. 111.

6. The limited exceptions to this would include, not surprisingly, those manuscripts which are more book-like in nature, for example, literary manuscripts and codices.


8. Archives, Personal Papers, and Manuscripts, p. 3.


10. Ibid., pp. 91-92.

11. Ibid., p. 91.

12. It should be noted that the MARCAMC format has approximately 25 note fields (depending on how these things are counted). A planned forthcoming revision of Archives, Personal Papers, and Manuscripts will establish more congruity between the cataloging rules and the format.


16. This confusion has continued in some uses of the MARCAMC format, where the dates of manuscripts collections are occasionally showing up as a subfield of field 260, Imprint.

17. Archives, Personal Papers, and Manuscripts, 4.1B5, p. 13.

18. Ibid., 4.5, p. 17.

19. Ibid., p. 6.

Archival Information Exchange and the Role of Bibliographic Networks

H. THOMAS HICKERSON

More than 70,000 bibliographic records describing archives and manuscript holdings had been entered into the Research Libraries Information Network (RLIN) by 1 August 1986. These catalog records were contributed by forty-seven archival programs, including special libraries, art museums, state archives, and the National Archives, as well as university repositories. This database, inaugurated in January 1984, is already the largest compilation of archival data accumulated and is currently growing at a rate of 900 records per week. In 1988, the Library of Congress' National Union Catalog of Manuscript Collections (NUCMC) will begin using RLIN to compile descriptive data for its annual volumes. The OCLC (Online Computer Library Center) database includes about 50,000 Archival and Manuscripts Control (AMC) records. In addition, the University of Toronto Library Automation Systems (UTLAS), has announced implementation of the MARC AMC format, and the Washington Library Network (WLN) has begun planning for format implementation. The evidence suggests that participation in library bibliographic networks is becoming integral to the management of archival information.

At this point, the adoption of library bibliographic networks as viable means for managing archival information seems a natural development. Archivists and librarians share the same goal of information

H. Thomas Hickerson is Chairman, Department of Manuscripts and University Archives, Cornell University Libraries, Cornell University, Ithaca, New York.
control and dissemination. Library networks use the MARC (MAchine-
Readable Cataloging) format, the most widely adopted implementation
of the American National Standards Institute's (ANSI) standard for
exchange of bibliographic information, and access to the bibliographic
networks is available in thousands of libraries across the country. The
concept of integrated access to the variety of library holdings is becom-
ing increasingly attractive; however, the Society of American Archivists
(SAA) had not anticipated this outcome a decade ago when it formed the
National Information Systems Task Force (NISTF) to examine current
national programs for the development of a national information
system.  

There are basic differences between common archival practice and
standard library procedures. That technical compatibility and a com-
munity of interest have developed is the result of a cooperative process.
In continuing this process, it is necessary to understand the issues that
have been central to cooperation and which will be important in deter-
mining the role that bibliographic networks will play in the future.
This article reviews past developments, describes current activities, and
examines basic issues for the next decade.

IDENTIFYING STANDARD ELEMENTS
FOR ARCHIVAL DESCRIPTION

The task initially assigned to NISTF by the SAA council was the
resolution of a conflict generated by a request from the staff of the
National Historical Publications and Records Commission (NHPRC)—the staff requested SAA endorsement of their effort to
develop a national database of archival information. This request
seemed to conflict with the profession's traditional support of NUCMC.
By authorizing a comparative evaluation, SAA sought a technical solu-
tion to a largely political question. Chaired by Richard Lytle of the
Smithsonian Institution, the task force avoided the choice between two
highly charged options by broadening its focus from a consideration of
"current national programs" to an exploration of ways to construct the
best possible national informational system for archives and manu-
script control.

Fundamental to NISTF planning was the assumption that archives
(institutional or governmental records) and manuscript collections
(personal papers) were sufficiently similar to be well served by the same
system. Traditionally, distinctions have been made between methods
appropriate for the management of archives and methods for the management of manuscript collections. Representative of this division was NUCMC's exclusion of institutional or governmental archives maintained by the originating agency, which effectively excluded the vast majority of such records. In order to address the issue of similarity, NISTF commissioned a study to examine current archival descriptive practices.

With the support of the National Endowment for the Humanities (NEH), Elaine Engst of Cornell University conducted an analysis of the descriptive practices of a broad variety of repositories and of the various national and specialized databases. Based on this study, a report, "Standard Elements for the Description of Archives and Manuscript Collections," was submitted to the task force in September 1980. The study found that various types of repositories have similar needs and responsibilities to provide physical and intellectual control of and access to their holdings, and that commonly accepted methods of archival description are used to carry out these functions. Because of these similarities, common standards for bibliographic description, encompassing the needs of both archives and manuscript repositories, could be developed; however, the development of viable information-sharing mechanisms would be obstructed by the lack of a common nomenclature for recording information. It was increasingly apparent to the members of NISTF that the role of SAA was to develop and maintain standards to facilitate the interinstitutional exchange of information, rather than to build or operate an information system. Therefore, development of a data element dictionary and an exchange format was begun in early 1981.

In order to prepare a data element dictionary, NISTF established a working group, chaired by David Bearman, NISTF project director, and composed of representatives of the National Archives and Records Service (NARS), the Library of Congress (LC), the Research Libraries Group (RLG), and the NHPRC Data Base participants. The dictionary was intended to provide standard definitions for all information elements employed in any and all archives, records centers, and manuscript repositories; it included administrative data as well as bibliographic information. A draft was prepared by the working group and was issued for professional review in February 1982.
THOMAS HICKERSON

DEVELOPING COMPATIBILITY BETWEEN LIBRARY STANDARDS AND ARCHIVAL PRACTICE

The task force next embarked on the creation of an exchange format. While the data element standard was intended for manual as well as automated systems, the exchange of data in machine-readable form was always a primary concern. The exchange format needed to include designated fields for recording all information elements defined in the dictionary, and it needed to conform to national and international standards for exchange of bibliographic information in machine-readable form. In addition, the format had to accommodate the collective approach to bibliographic description and include fields for recording the activities involved in the acquisition and maintenance of archival materials. While a manuscript collection may be composed of a single document, most collections include thousands of items which are treated as a single bibliographic entity. Documents in a collection may have several personal or corporate authors, address a broad range of topics, and include correspondence, diaries, account books, and other types of documents. It was essential to include fields for recording collection management data in order to reflect the integration of bibliographic description with other processes—such as acquisition, arrangement, storage, and preservation—in the control, maintenance, and use of archival holdings.

The most commonly used and widely accepted standard for bibliographic exchange is the MARC format. Unfortunately, the MARC format for manuscripts published in 1973 was primarily designed for individual item cataloging and poorly suited for archival use. In early 1981, however, LC indicated its willingness to make substantial changes and allowed SAA to conduct the revision process. The revised format, USMARC Format for Archival and Manuscripts Control (AMC), was accepted by the SAA Council in the fall of 1981, approved by the American Library Association (ALA) Committee on the Representation in Machine-Readable Form of Bibliographic Information (MARBI) in January 1983, and published by LC in late 1984. The format incorporates the collection approach to cataloging and includes all data elements defined in the dictionary; an “Actions” field (MARC field 583) can be used for recording information about administrative and reference actions. In response to discussions with the Standard Elements Committee of the ALA Division on Rare Books and Manuscripts, the format also includes fields for cataloging publica-
Archival Information Exchange

...tions handwritten before the advent of printing. The preexisting fields—for single item cataloging and for other bibliographic systems—were retained. These inclusions broadened the acceptability and usability of the format. Future modifications require approval by both LC and the SAA Committee on Archival Information Exchange, which succeeded NISTF in 1983.

The development of MARC AMC was essential to the current level of archives/library integration, but the degree of its success would not have been possible without the completion, almost simultaneously, of two other projects. One of these was the substantial revision of the Anglo-American Cataloging Rules for manuscripts, compiled by Steven Hensen at the Library of Congress. This revision was part of an LC project (sponsored by NEH and carried out in conjunction with the Council of National Library and Information Associations) to prepare a series of manuals to treat special format materials not adequately covered in the second edition of the Anglo-American Cataloguing Rules (AACR2). The resulting manual, *Archives, Personal Papers, and Manuscripts: A Cataloging Manual for Archival Repositories, Historical Societies, and Manuscript Libraries* (1983), has not been accepted as an “official” revision of AACR2 but has been accepted as a standard for AMC cataloging by both OCLC and RLG. The other significant project was the development of enhancements to RLIN that supported the functions and design of the new format.

**LIBRARY BIBLIOGRAPHIC NETWORKS AND ARCHIVAL MANAGEMENT GOALS**

Providing effective access to the wealth of historical documentation housed in archives and manuscript repositories is a fundamental goal of archival practice. In attempting to meet this goal, the creation of a national database long has been seen as a critical objective. In 1949, a Joint Committee on Historical Manuscripts was formed by SAA and the American Association for State and Local History to study the development of a national union catalog. After deciding that such a catalog could be established through the voluntary cooperation of libraries and other repositories, the committee began to search for a host institution. The offer in the fall of 1951 by LC to house and administer this catalog eventually led to the establishment of NUCMC. The potential benefits of automation in providing nationwide access to archival resources led to the creation of the NHPRC Data Base Project in 1976 and the...
establishment of NISTF the next year, and is a significant element in the continuing growth of network participation.\textsuperscript{17}

Library bibliographic networks have become major databases of information concerning the nation's published resources. However, this significant development has come as a by-product of the effort to derive the maximum benefits inherent in shared cataloging. While the networks have, to varying degrees, developed other programs and services, shared cataloging remains the primary motive for library participation. Shared cataloging also remains critical to the financial well-being of the networks, and their fiscal management is largely predicated on this factor.

Archival participation falls almost entirely outside of this fiscal structure. Since their collections are unique, archivists contribute original records at minimal cost and seldom "derive" bibliographic records. Therefore, they do not benefit from the economics of shared cataloging, nor do they contribute substantially to network income. The number of AMC records in any bibliographic database will probably never exceed 1,000,000, so archival participation is not a substantial drain on the system resources in gross terms. However, the need for greater record lengths, special processing functions, and the capacity to use numerous name, form, and topical headings to facilitate access means that AMC use cannot be ignored in estimating development and operating costs.

In addition to economic considerations, there are other differences between library and archive network participation. In the realm of published materials, as a network matures, the value of each new membership by a similar institution tends to decrease. With archival participation, the potential value of each new member's contribution remains constant. Conventional borders of membership also differ. Membership by state, federal, and corporate repositories, which may have little interest in other network programs and services, are critical to the enrichment of the database. Additionally, archivists have more to lose from the traditional competitiveness and division between the bibliographic networks. For archivists and users of historical documentation, divided access is limited access.

All of these differences serve to complicate issues of both governance and mission. It seems apparent that in order to satisfy archival goals and expectations and to rationalize their management, networks must acknowledge their role as scholarly and public resources and develop the mechanisms necessary to support that role.
Archivists first began to use computers in the mid-1960s, primarily in order to provide detailed access to the contents of a specific collection or small groups of related collections. These printed indexes and inventories, commonly referred to as archival finding aids, were generated by mainframe computers in the 1960s and 1970s; today they are usually produced by microcomputers. But whether manually created or computer generated, archival finding aids are central to the control and use of collections and are the chief source of information in compiling an archival cataloging record. It is unlikely that the AMC format will be widely used in the compilation of finding aids, but there is considerable interest in developing online interfaces between cataloging databases and finding-aid databases maintained locally. This would allow a system user to go directly from a catalog record of interest to a finding aid describing the collection in detail. This interface parallels the natural progression of the research process and will be a focus of future development. Currently, there are three major areas of AMC-related development: broadening access to archival information; developing mechanisms for recording and tracking collection management functions; and integrating access to published and unpublished sources. In all three of these areas, some of the issues are technical, but many are matters of policy, practice, and politics.

Broadening Access to Archival Information

The implementation of RLIN AMC in early 1984 established the viability of the new MARC format. This crucial development resulted from a cooperative project of Yale, Cornell, and Stanford University Libraries, the Hoover Institution, and RLG, with funding from the U.S. Office of Education's Title II-C (Research Libraries) Program. The system was designed to meet the needs of a broad range of repositories, and RLG has maintained its commitment to build a database of national scope. In addition, in the summer of 1986 RLG tape-loaded 12,507 records describing the holdings of 594 New York State repositories. These records were originally produced using SPINDEX (Selective Permutation INDEXing), a batch-processing system developed by the National Archives and were compiled by the Historical Documents Inventory, a statewide survey conducted by the New York Historical
THOMAS HICKERSON

Resources Center at Cornell University. In 1985, the Historical Resources Center began entering survey records directly into RLIN and by 1990 will have added the holdings of some 400 additional repositories. When NUCMC begins to use RLIN in 1988, it will offer an avenue through which any repository can contribute data to the RLIN database. The Center for the History of Physics is planning to serve as a similar avenue for collections documenting the history of physics. These and other special projects, as well as member contributions, will continue to enrich the database. RLG has also assiduously encouraged "special membership" by archival programs and has given archivists a formal voice in governance through the establishment in 1983 of a Task Force on Archives, Manuscripts, and Special Collections.

To this point, RLG has played a predominant role in integrating archives management and access with network activities and services. This is due to a combination of factors—the initiative taken by certain RLG member libraries; the availability of funding from the Title II-C Program, NEH, and the NHPRC; and support by the RLG Board of Directors and staff. Additionally, RLG's mission statement explicitly acknowledges its role as a scholarly information resource. Nonetheless, the process of integration has not been without its difficulties. Questions regarding consistent application of system-wide standards have concerned both archivists and librarians. Allocation of staff to support archival projects will never be timely or sufficient. Clarification of the roles various archives and special collections should play in the shared resources programs is only now beginning. Developing mechanisms to facilitate shared access to RLIN and to holdings in other networks is also a major concern. These and other practical and political issues must be addressed. Fortunately, it does appear that a forum for constructive discussion is in place.

OCLC implemented the original MARC manuscript format in the mid-1970s, but few repositories adopted it. In addition to constraints in the format's design, the limited length of OCLC's bibliographic records and the absence of subject searching further discouraged interest. However, OCLC added AMC in November 1984, and, with expanded record size and subject searching capabilities scheduled to be included in 1987, it will be a viable system for consideration by archivists.

Many archival programs are divisions of OCLC libraries, and an increasing number will use OCLC AMC to catalog their holdings. OCLC will not use the type of special archival management features which RLG developed, but repositories will use the system to provide multi-institutional access, to produce catalog cards, and to generate
Archival Information Exchange

machine-readable tapes for loading into local online catalogs. OCLC now has begun to actively solicit archival participation, and the potential exists for OCLC to play a major role in expanding access to archival holdings. However, in order to limit possible frustrations, OCLC must be aware of archival requirements and objectives, be willing to make technical enhancements to support these requirements, and adopt political strategies that foster these objectives.

The role of any one network in broadening access is vital but limited; cooperation between networks is essential. Whether through the regular exchange of data between networks or through the implementation of telecommunication protocols allowing mutual access to the various databases, information-sharing is necessary to meet archival access goals.

Tracking Collection Management Functions

While considerable attention has been focused on expanding access to archival information, substantial effort has been devoted as well to the development of information processing and management capabilities. In the RLG database, an RLIN AMC record is composed of two parts, a “bibliographic” segment for recording bibliographic information, and an “archival control” segment for recording management information. The archival control segment, which is based on MARC fields 541 (Immediate Source of Acquisition) and 583 (Actions), is itself divided into two parts, a processing control screen which includes accessioning, donor, and location information, and an action screen where specific management functions can be specified. Multiple processing control screens can be included in a single AMC record to record additional accessions to existing collections, and multiple action screens may also be recorded for any particular accession. Access to archival control screens can be restricted to the creating repository, and access to donor information is always restricted.

The use of management data in RLIN AMC is facilitated by the RLIN Reports System (RRS), a generalized reporting package which can be used to produce a variety of printed reports, including accessions lists and donor lists. RRS can also generate time-triggered alerting reports on the status of materials in process, on access restrictions due to expire, on the scheduled transfer of documents from an office to the archives, or on any other designated functions. Particularly valuable to government archivists is its ability to link access to all of the records from the various divisions of a large state or federal agency. The "related
THOMAS HICKERSON

title" search in the online system, based on data in field 773 (Host Item Entry), allows the retrieval of bibliographic records for materials that are component parts or subunits of a particular "host" or "parent" collection. Additionally, local indexes allow one to search one's own holdings by any local control number or by donor name or originating agency.21

Government archivists are quite interested in investigating the use of AMC for recording and tracking management functions and for decision-making. The seven state archives that are RLG "special members" (a membership category available to nonresearch libraries) are participants in an NHPRC-funded project. The project supports both integrating access to government records with access to other historical materials, and evaluating RLIN AMC as a mechanism for sharing management information; the project's purpose is to share data regarding archival appraisal.22 Appraisal does not mean monetary value but indicates, rather, the process of determining the value of records based upon their current administrative, legal, and fiscal use; their evidential and informational or research value; their arrangement; and their relationship to other records.23 Based on this appraisal, records are selected for archival preservation or designated for destruction.

Appraisal is a major function of government archival programs. While the statutes and agencies of the various states differ, increasingly, the same functions of government are conducted in all states, and records containing comparable data are generated. This project seeks to determine whether mutual access to appraisal decisions—and the grounds for those decisions—will improve and simplify the appraisal process in these repositories. If successful, the project could broaden the basis for archival participation in bibliographic networks.

Between July 1984 and January 1986, the staff of the National Archives and Records Administration (NARA) conducted a study which examined the capacity of the MARC AMC format to carry information for both the control of, and access to, federal records throughout their "life cycle." (The "life cycle" of a body of records dates from their creation through their active use, occasional use, and ultimate disposition—either archival preservation or destruction.) RLIN AMC was selected as the "test" vehicle, allowing a comprehensive evaluation of RLIN. Seven terminals were installed, and archivists responsible for appraisal, arrangement and description, reference, and record center activities entered information that their units generated or used.24

Testing was completed in the fall of 1985, and a final report was submitted in February 1986.25 The format is capable of holding descrip-
Archival Information Exchange

tive information across the entire range of life cycle stages and the AMC fields are compatible with most data elements inherent in NARA and agency-produced descriptions. However, NARA staff found that the process control functions were not sufficiently sophisticated to handle easily the needs of a repository as large as the National Archives. Nonetheless, the project staff recommended developing automated systems with data elements compatible with MARC fields that will also support the creation of MARC records for exchange purposes. The project staff also recommended continued use of RLIN as a means to disseminate descriptive information about their holdings and to provide NARA staff with access to this valuable source of archival data.26

NARA's decision to process management information locally and to generate bibliographic data in MARC format for loading into national networks is an approach that may be adopted by many repositories. This approach, in fact, is integral to the design of MicroMARC, microcomputer system software developed at Michigan State University; it will support local cataloging, reference, and report generation, and will also create a MARC AMC data file for transfer to other systems. OCLC advocates a local-processing approach, which is consistent with their decision not to incorporate special features for processing AMC data. However, local-processing assumes a willingness by networks to load locally-produced magnetic tapes or to develop the necessary links for electronic transmission. (This process may require special costs to support the loading of relatively few bibliographic records.) It is essential that appropriate agreements and protocols be established early in order to avoid unrealistic expectations.

The AMC format was designed to provide integrated access to bibliographic and process management data. Devising effective, cost-efficient means to support this integration is a current priority; local integrated library systems will play a major role in this area.

Integrating Access to Library Holdings

Traditionally, access to unpublished library holdings was isolated from the listings of published materials. If an archival department maintained a card catalog, it was often maintained as a separate entity, both intellectually and physically separate from the "general" catalog. Library of Congress Subject Headings (LCSH) were considered too broad for archival use, and AACR conventions deemed inappropriate. Often these methodological differences were accompanied by administrative separation—collections existed as libraries within libraries.
THOMAS HICKERSON

While few would suggest that this situation has benefited the user, library administrators have often allowed this situation to continue, concentrating instead on "mainstream concerns." Archivists and other special collection curators, too, have guarded their independence and opposed efforts to increase conformity. Library networks have mirrored the situation in their member libraries, concentrating on monographic and serial control. This situation is changing however. New or revised formats for visual materials, archives, and manuscripts, and machine-readable data files have been recently developed as library administrators increasingly expect that networks should support the control of all forms of library holdings. 27

The cooperative project by Yale, Cornell, Stanford, and RLG, which developed RLIN AMC, sought to integrate library records. The participants chose to adopt conventions supporting the use of LC Name Authorities, AACR2 forms of headings, and LCSH. While these sources often have been criticized by archivists, they were necessary; common standards and access terms are essential to providing multi-institutional access to archival holdings and integrated access to the various materials within each library. 28 These practices have been widely followed, in government archives as well as in library repositories. 29

Increasingly, integrated access will be provided via online public access catalogs. RLIN AMC records have been loaded into online catalogs at Stanford and New York University (NYU). These transfers have led to some difficulties; at NYU, over 90 percent of the AMC records were too long for the full public display, and restricted management data appeared in the public displays. With the installation of the next generation of Geac hardware and software, it is expected that these problems will be resolved; in addition, the Geac system will provide a linked authorities subsystem which will be of considerable value to the archivists at NYU. 30 At the Ohio Historical Society, OCLC cataloging will be used to generate AMC records for loading into a local online catalog, which in turn will provide the kind of subject searching capabilities not yet available in OCLC. 31 The growing number of online public access catalogs and the development of local processing capabilities make it essential that archivists get involved in planning and formulating local library systems' requirements; the traditional methodological and administrative isolation of special collections must become a thing of the past.

The creation of the AMC format led to new ways of processing and disseminating archival information. National bibliographic networks offer capabilities long needed by archivists and researchers. Network
participation will open new opportunities, affecting acquisition, preservation, and use of documentary materials. And new mechanisms for communication and cooperation will develop. In conclusion, this article describes some of these developments and their impact.

THE IMPACT OF BIBLIOGRAPHIC NETWORKS ON ARCHIVAL PRACTICE AND THE ARCHIVAL PROFESSION

During the next decade, archival practice will be significantly influenced by widespread participation in national bibliographic networks. Some changes will be directly attributable to this participation; other changes will be more subtle, resulting from the interaction of various factors. In surveying these developments, five general areas will be examined: standards, professional relationships, cooperative arrangements, collection use, and education and training. These categories are not exclusive; developments in one area clearly will affect other areas. The examination is only cursory and is intended to present issues facing archivists and to suggest the effects they may have on the profession.

Standards

Standards are common to both the archive and library environments. There are specification standards, designed for simplification and interchangeability. Other standards are guidelines: sets of definitions and rules that will produce improved results if applied, but that are not designed for mechanical uniformity or interchangeability. While a standard may be derived from the policies of a single individual or institution, the creation and maintenance of a consensus standard is often a complex and demanding process. It was a significant step for the archival profession when, in 1980, NISTF decided to develop a standard for the exchange of descriptive information.

Although archivists have traditionally cited the virtues of standardization and criticized the profession for its lack of descriptive standards, little progress was made until the 1980s. Impetus for recent progress came primarily from three closely related areas: use of automation, interest in multi-institutional data exchange, and participation in bibliographic networks. When archivists first began using automated techniques, it was quickly apparent that increased standardization was
THOMAS HICKERSON

necessary in order to derive any benefits from computerization. It was equally clear that standards were essential for multi-institutional sharing of descriptive information. Bibliographic networks are playing an important role in the development of descriptive standards for several reasons. Network participation requires conformity to certain standards through the networks’ incorporation of enforcement mechanisms that support standardization. Networks provide an effective working environment for the creation and maintenance of standards, and networks can represent archival concerns in the development of national and international standards. Networks will continue to play an important part in standardizing descriptive practice, but it is important that their role not become confused with the role of SAA in the standards process.

**Professional Relationships**

Many different forces are changing the professional relationships of archivists, including the “information explosion,” the use of new technology, and the rapid deterioration of printed and other information sources. However, it appears that network participation will be the most influential in affecting relationships between the archival and library professions, between the different types of archival programs, and among the various departments in libraries.

A little over a decade ago, when SAA was offered an opportunity to play a consultative role in the revision of the *Anglo-American Cataloging Rules*, the matter was not considered sufficiently germane to the primary interests of archivists to be pursued actively. Now, the SAA bibliographic exchange standard is also a library standard, and it is being jointly maintained by SAA and LC. In 1986, an RLIN Users Roundtable was established by SAA, followed by an OCLC Roundtable. These changes are indicative of trends to expect in the future. SAA has broadened its perspective and expanded its role; it must now be willing to devote the resources necessary to fulfill this role and to adequately represent the widening interests of its members.

Institutional divisions have always characterized the archival profession. Now a diversity of documentary holdings is represented in a single database, and integrated access to this information is available across the country. University repositories and governmental archives can belong to the same network, share an electronic mail system, and use the same conventions in describing and providing access to their holdings. Network participation may serve to bridge long-standing institutional and methodological differences.
Librarians, archivists, and curators will feel a greater sense of common cause. This should produce a general strengthening of library resources. For archivists, there may be increased automated systems support. Awareness of archival holdings and methods will increase. It is possible that the collective approach to cataloging may be adopted for control of various printed and microform materials. Additionally, improved communication and cooperation among special collections staff may enhance the role of special collections in overall library management.

Cooperative Arrangements

Most archivists share a rather holistic view of the universe of documentation and a sense of common purpose in the continuing effort to document the nature of human existence. While there is occasional competition for a few select collections, most archivists now agree that there are many more collections deserving preservation than there are archival resources with which to preserve them. As a result, institutional cooperation has been viewed as a means to expand archival capabilities. In the 1960s and 1970s cooperative archival networks were established in several states, primarily in the Midwest. The goals of these statewide networks were to increase the preservation of historical materials and to expand the accessibility and use of archival sources. While the organizational structure of the networks varied, they were all based on the leadership (or generosity) of a central state agency. Although these networks made progress in meeting their primary goals, the budgetary constrictions of the late 1970s and early 1980s reduced funding overall and placed constraints on the program support role of central agencies. These cutbacks made it apparent that the breadth of cooperative support and services was, in some states, inadequate to maintain a viable level of network activity.

While the success of these statewide networks has been limited, there are demonstrable benefits to sharing bibliographic information and broadening access to archival sources. Although in some states, such as Missouri, a comprehensive catalog of the holdings of network repositories is available at all sites, the advantages offered by an online bibliographic network are substantial. In addition to being an effective tool for sharing access, bibliographic networks could greatly facilitate the centralized cataloging functions provided in some states. Electronic mail and interlibrary loan systems will also support cooperative programs. In a state like New York, where the holdings of most repositories
THOMAS HICKERSON

will be in RLIN and most research universities belong to RLG, the potential is considerable. However, the vitality of statewide archival networks is dependent on the development of organizational structures with adequate resources, effective governance, and essential services.

Collection Use

Bibliographic networks could have a considerable effect on the use of archival holdings. Within a given repository, access will be improved as a result of more consistent cataloging procedures; in those systems offering sophisticated searching capabilities, the user can search the holdings using various combinations of personal, corporate, topical, chronological, geographical, and form and genre headings. Researchers will be able to use just one search strategy to identify relevant published and unpublished sources; and they will be able to do national searches to find related collections housed in repositories across the country. Although the effects will be gradual, the expanded availability of bibliographic information will lead to an increase in both the volume and diversity of collection use.

Reference services also will be substantially affected. Researchers will have the ability to access data regarding archival holdings at sites other than the reading rooms of archives and manuscript repositories. In some cases, access will be located in the library’s general reference area, necessitating a broadened knowledge by reference librarians of the nature and usage of archival materials. In other cases, researchers will use a public access catalog terminal, although it is not yet clear what kinds of online displays will be best for AMC catalog data. Network participants will have to develop cooperative protocols for reference and interlibrary services. The RLG Task Force on Archives, Manuscripts, and Special Collections has recently prepared guidelines regarding the loan, photocopying, or microfilming of special collections materials for scholarly research. These developments will alter traditional archival reference functions and existing patterns of interaction among librarians, archivists, and researchers.

Education and Training

In recent decades, a graduate degree in either history or library science met the educational criteria for admission into the archival profession. According to a study done by David Bearman, of the 140 job advertisements that appeared in the SAA Newsletter between September
1985 and August 1986, more advertisements requested either an MA or an MLS than cited either alone.\cite{37} Evidence suggests, however, that the prominence of the MLS is now gradually increasing; Bearman's study reports that, of those advertisements requesting one degree or the other, more than two-thirds cited an MLS. However, the rate of change is not great. Much more striking is the rapidly increasing frequency of requests for "knowledge of the MARC AMC format" or, more specifically, "knowledge of RLIN/AMC." SAA workshops teaching the fundamentals of MARC AMC cataloging are being heavily attended across the country. Familiarity with these new descriptive practices and standards and with their application will become an important element in the education and training of archivists.

Bibliographic networks are playing an important role in this educational process by providing basic training and serving as a tool for developing and refining new techniques. Network participation will contribute to a homogeneity of experience, making it possible for a trained archivist to move from one repository to another without extensive retraining. Having this base of common experience will contribute to increased professionalism and a sense of common mission.

Conclusion

In summary, then, bibliographic networks can play an important role in the management and dissemination of archival information. They can improve access to archival holdings and integrate access to both published and unpublished resources. Networks can also serve as a link for communication and cooperation between the various professions and institutions engaged in preserving historical documentation. Bringing these opportunities to fruition will require innovative policies, programs, and governance.

References


3. Of the estimated 50,000 records in the OCLC database as of August 1986, approximately 40,000 were originally entered in the MARC Manuscript format prior to the implementation of the MARC Archival and Manuscript Control format in November 1984. Glenn Patton, Senior Support and Training Specialist, OCLC, to H. Thomas Hickerson, personal communication, 27 Aug. 1986.


Archival Information Exchange

The Cost of Converting to MARC AMC: Some Early Observations

PATRICIA D. CLOUD

The MARC Archival and Manuscripts Control (AMC) format is rapidly becoming the centerpiece for the new orthodoxy in archival automation. Archivists who wish now or in the future to adopt automated intellectual control procedures or to exchange descriptive information with other archivists will be subject to practical and professional pressures to accommodate the MARC AMC format. New possibilities for local implementations are emerging; the size and significance of online archival databases are growing; national standards, documentation, and guidelines are in place. Everything, it seems, is ready to go.

Nevertheless, critical issues surrounding automation with MARC AMC format remain unexamined. One of the chief issues is the cost in time and resources of using the new format. At a time when so many repositories are planning first-time automation projects using MARC AMC, it may be wise to review some of the experiences of archives who were pioneer users.

The cost of creating MARC AMC records will vary greatly among institutions, depending in part on whether or not a bibliographic utility, such as OCLC or RLIN, or a local system, such as NOTIS, is used; if a local system is used, costs will be affected by the type of system and by the anticipated uses for the MARC records. However, in addition

Patricia D. Cloud is Assistant University Archivist, Northwestern University Archives, University Library, Evanston, Illinois.

WINTER 1988
to the major costs of participating in a bibliographic utility or installing a local system, or the purchase of hardware, software, or subscription fees—issues that are beyond the scope of this essay—staff time will be the most significant cost factor in the creation of MARC AMC records. One recently completed project provides the opportunity for making some tentative generalizations about this important factor.

From 1984 through 1986, twelve major research libraries participated in the retrospective conversion of approximately 21,000 existing data records describing archival and manuscripts materials using RLIN, the bibliographic utility of the Research Libraries Group (RLG). This retrospective conversion project, referred to as the AMC RECON Project, was funded by the National Endowment for the Humanities (NEH) Research Resources Program and the Pew Memorial Trust. It targeted materials currently available for scholarly use and particularly those of significant research value to scholars in the humanities. Participants were asked to refrain from creating AMC records principally related to official university records of administrative activities.

All records created for the project were to conform to a minimum cataloging standard recommended by RLG. The RLG Standard established required fields and mandated the use of Steven L. Hensen's manual, *Archives, Personal Papers, and Manuscripts: A Cataloging Manual for Archival Repositories, Historical Societies, and Manuscript Libraries (APPM)* and the *Anglo-American Cataloguing Rules, 2d ed.* (AACR2), for bibliographic descriptive practices. According to the RLG Standard, records created in the RLIN AMC file must contain a main entry, title, date, and physical description, as well as an identification of the institution creating the record.

While this standard allows AMC records to be quite abbreviated, it was assumed that records created for the AMC RECON Project—most of which represented collection level descriptions of significant research materials—would contain considerable detail, and that the average record would require between ten and fifteen name and topical subject entries. It was also assumed that most records would contain collection name; type of materials; creation or span dates; size, occupation and flourishing dates of the collection's creator or creating agency; summary or scope note; list of prominent persons represented in the collection; and notes on any restrictions, provenance, and finding aids.

The RLG Standard requires, in addition, that name headings be established according to AACR2. Participants were required to search the Library of Congress Name Authority File (LCNA), which is avail-
Cost of Converting to MARC AMC

able online, for name form and to follow AACR2 for establishing names not found there. Topical subject headings, which comprise the traditional bibliographic approach to creating subject access, were not required. However, if any topical subject headings were present in a record, which was expected to be the case for most records created for the AMC RECON Project, then at least one heading was required to conform either to *Library of Congress Subject Headings*, 9th ed. (LCSH)* or to *Medical Subject Headings* (MeSH).* This policy would ensure the integration of AMC records with RLIN’s files for books, serials, recordings, scores, visual image materials, and machine-readable records. Given this profile of the records to be created following these standards, project participants expected to spend an average of approximately two hours to produce each AMC record.10

This estimate was based in part on the experiences of an earlier pilot project: in 1983 and 1984, four RLG members participated in a Title II-C funded project designed to establish the use of the new format in RLIN. These members, Yale, Cornell, Stanford University, and the Hoover Institution, created the first AMC records in RLIN’s AMC file during 1984.11

The twelve participants in the AMC RECON Project were the libraries of Brigham Young University, Brown University, Columbia University in New York, Dartmouth College, Johns Hopkins University, New York University, Northwestern University, Rutgers University, the State University of New York (SUNY) at Buffalo, the New York Historical Society, and the Bentley Historical Library of the University of Michigan. For the purposes of this paper, each of the participating institutions was contacted and queried as to the length of time they spent creating records and the authority routines they followed. While not all of the information provided by the participants could be analyzed quantitatively, some general observations can be made on the strength of their responses.

Retrospective conversion is an activity firmly established in library practices. It is the process whereby card catalog records of library holdings are converted to machine-readable records, and involves the transformation to MARC format of information stored in the traditional card catalog. Whereas archivists are familiar with the techniques of reappraisal of existing collections, they have had as little experience with retrospective conversion as they have had with MARC format and, therefore, some fundamental observations are in order.

Retrospective conversion of archival and manuscripts material is similar to retrospective conversion of published material in that for
both the basic idea is to create machine-readable records to replace pre-existing manual records; however, the procedures followed and, not coincidentally, the costs incurred are very different. While published matter is produced in quantity and, in most cases, with standardized, pre-existing bibliographic data, manuscripts are unique.

Librarians considering a retrospective conversion project evaluate the degree to which they are likely to find pre-existing machine-readable records for the items in their collection. The Library of Congress, RLIN, OCLC, or other regional bibliographic utilities can be counted on to have records for some or most of the items to be converted. Once a pre-existing MARC record is found, all that remains is to verify its information and duplicate it. Most libraries follow this procedure for well over 50 percent of the records they need to convert; only a small percentage of any library collection is “unique,” or so rare as to not be cataloged in MARC. In comparison, virtually all archives and manuscripts collections are, by definition, unique. This means that for archives and manuscripts retrospective conversion projects, most records to be converted will be “tagged” or coded in MARC by the repository during the conversion.

For both libraries and manuscripts repositories, the “chief source of information” for cataloging purposes is not the material itself, but rather a pre-existing description of it—be that a card, inventory, or some other form of finding aid. However, since Hensen has established the finding aid as the chief source of information for cataloging of archival and manuscripts collections, the distinction between original cataloging and retrospective conversion of these materials can appear somewhat artificial. The assumption underlying the AMC RECON Project was that virtually all records would be created from pre-existing finding aids.

Six participants reported that their work on the project took longer than they had anticipated. Crucial factors affecting the amount of time it took to create records seem to have been identified similarly by all repositories, whether or not they found the project unexpectedly time-consuming. The factor that seemed to have the most effect on creation time was the integrity of the existing finding aid (see table 1).

Finding aids used in archives can be catalog cards, descriptive inventories with extensive narratives, or a number of other kinds of lists. Needless to say, the “integrity” of the existing finding aid is independent of its form. Several participants—including those who did not take longer than anticipated to create records—reported that the existing finding aids proved inadequate in a significant number of cases. Seven
Cost of Converting to MARC AMC

TABLE 1
FACTORS AFFECTING CREATION TIME OF AMC RECORDS

<table>
<thead>
<tr>
<th>Factors Affecting Creation Time</th>
<th>Number of Institutions Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrity of Finding Aid</td>
<td>8</td>
</tr>
<tr>
<td>Authority Work</td>
<td>5</td>
</tr>
<tr>
<td>Cataloging Problems</td>
<td>3</td>
</tr>
<tr>
<td>Staff Turnover</td>
<td>1</td>
</tr>
</tbody>
</table>

Repositories mentioned the need to go beyond the available finding aid and consult the collection or manuscript itself in order to determine critical information such as date, language, and extent. One participant reported the finding aid provided insufficient information for nearly 20 percent of the records; two other participants cited 30 and 40 percent.

The second factor that slowed record creation time was authority work, that is, the process of verifying name and subject headings in local authority files and in LCNA. Depending on the standards established at a particular institution, authority searching for the project could involve as many as nine separate steps (see table 2). All project participants were required to search the LCNA (available on RLIN as the Library of Congress Resource File [LCR]) and LCSH, in the event that topical headings needed to be created. Most of the archives reporting their procedures also checked local authority and bibliographic files in addition to LCNA. Procedures beyond this varied considerably. Repositories that checked further consulted at least one of the following sources: OCLC or RLIN Books files, the RLIN AMC file, or manual files such as the National Union Catalog of Manuscript Collections (NUCMC).

There have been some difficulties associated with using NUCMC as a source for establishing name forms. Traditionally, archival and manuscript collections use the fullest possible form, with qualifying information where available, and NUCMC name entries have been so established. This procedure, however, is at variance with AACR2, which calls for establishing the most common form of name—which may or may not be the fullest form. Only recently, in conjunction with preparation to put NUCMC online through RLIN, have NUCMC entries been contributed to LCNA. The entries for names occurring in manuscript collections are being established using the fullest form; nevertheless, NUCMC remains an inadequate and possibly misleading
TABLE 2

Sources for Authority Work in AMC Record Creation

<table>
<thead>
<tr>
<th>Sources Used for Authority Work</th>
<th>Number of Institutions Using</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCSH*</td>
<td>12*</td>
</tr>
<tr>
<td>LCNA</td>
<td>12</td>
</tr>
<tr>
<td>Local Authority File</td>
<td>6</td>
</tr>
<tr>
<td>Local Bibliographic File</td>
<td>6</td>
</tr>
<tr>
<td>RLIN AMC</td>
<td>3</td>
</tr>
<tr>
<td>RLIN Books File</td>
<td>2</td>
</tr>
<tr>
<td>OCLC Bibliographic File</td>
<td>1</td>
</tr>
<tr>
<td>NUC</td>
<td>1</td>
</tr>
<tr>
<td>NUCMC</td>
<td>1</td>
</tr>
</tbody>
</table>

*Three repositories did not report details concerning their work. It is assumed that they followed the RLG Standard and searched LCNA and LCSH; all other figures reflect actual responses.

The extent of authority searching is dependent on the likelihood of finding a given heading in an established authority file. Since authority files are generally designed to serve the bibliographic community and, therefore, contain primarily authors' names, many archival repositories will discover relatively few headings established for their collections. Extra searching will extend the time required for authority work, as will the need to use manual, rather than automated, authority files. Manual authority files can exist on cards or microfiche (the Library of Congress makes its name authority files available on microfiche as well as online), or indeed in lists such as RLG's "Form Terms for Archival and Manuscripts Control." All types of authority files, however, should permit access to an established name form through variant forms and should clarify any additional difficulties the name might present. Files available online in MARC format are often easier and faster to use than manual files. Two repositories reported that authority work took roughly a third of the total record creation time.

Cataloging problems—including the difficulty of creating corporate headings according to AACR2—were mentioned as significant factors by three repositories. The final element, staff turnover, was reported by only one repository. However, this factor may emerge as a far more significant setback as more projects are undertaken and it becomes more difficult to find staff trained to code AMC materials.
While knowledge of the various cataloging tools and techniques is crucial and can be learned at some cost, the coding of AMC format requires a sophisticated approach to the material being described. There is a strong likelihood that candidates for jobs on retrospective conversion projects—often part-time temporary positions—will have some but not all of the proper background and training; staff turnover in these positions could easily have a profound effect on project schedules.

There are several ways to compile statistics on record creation time; project participants, who were not required by the grant to keep statistics, reported their statistics in two ways. Two participants kept track of each increment or stage of the record creation process and can report minutes spent coding, authority searching, and inputting. A comparison of these statistics shows the two institutions had very similar experiences with the project (see table 3). The Bentley Historical Library and Northwestern University Archives had virtually identical authority procedures. The shorter creation time reported by Northwestern University may be due in part to the higher proportion of single-item or small collection records created by Northwestern (80 percent of 1168 records, as compared to 20 percent of 3000). These records, which represented small collections or series, posed minimal difficulties in terms of description and subject access, and could be created far more quickly than those representing larger collections. Another possible explanation is that Bentley’s statistics were based on a sample taken one month after the project began, whereas Northwestern’s statistics were compiled using figures from the entire project. The average time needed for record creation dropped over the course of the project at Northwestern as catalogers gained familiarity with AMC and with the various work routines imposed by the project. Time spent on authority work by Bentley may reflect their reliance on manual, in-house authority files, whereas Northwestern accomplished virtually all authority searching online.

**TABLE 3**

Creation Time Statistics (Reported in Minutes per Task)

<table>
<thead>
<tr>
<th>Institution</th>
<th>Coding</th>
<th>Authority Work</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentley</td>
<td>14</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Northwestern</td>
<td>15</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Winter 1988
PATRICIA CLOUD

While it is possible to record minutes spent on various aspects of record creation, it is cumbersome, and becomes nearly impossible when problems arise with a record. Cataloging questions, complicated authority work, and the need to consult collections directly, all can kick records out of the workstream. Problem solving can take many hours and is not an activity that readily lends itself to the careful recording of statistics. Therefore, some repositories calculated their record creation statistics after the fact by dividing the number of records created by the number of staff hours spent on the project. Three repositories reported their statistics in this manner, and of these three, the total time per record varied considerably, from a low of 14 minutes per record at SUNY-Buffalo to a high of 2.9 hours at Dartmouth (see table 4).

The low creation time at SUNY-Buffalo is explained in part by the extraordinary brevity of their records: most of the SUNY-Buffalo records recorded single items with from three to five added entries. SUNY-Buffalo profited in addition from earlier cataloging experience, having begun a project with monographic cataloging on OCLC in 1982. At Northwestern, project staff had minimal previous cataloging experience and were required to become acquainted with AACR2 and RLIN after the starting date of the project.

Authority searching was not considered a problem at SUNY, despite their seven-stage searching process. They used automated authority files, which are helpful in keeping search time under control. In addition, most of their records were for literary manuscripts; hence, most of the names were readily discovered in the standard authority files.

Some Considerations

The implications of these statistics are not particularly hard to discern. For those institutions evaluating the total projected cost of

<table>
<thead>
<tr>
<th>Institution</th>
<th>Time per Record</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Minutes</td>
<td>In Hours</td>
</tr>
<tr>
<td>Dartmouth</td>
<td>175</td>
<td>2.9</td>
</tr>
<tr>
<td>Northwestern</td>
<td>165</td>
<td>2.7</td>
</tr>
<tr>
<td>SUNY-Buffalo</td>
<td>14</td>
<td>.24</td>
</tr>
</tbody>
</table>

TABLE 4
Creation Time Statistics (Reported per Record)
Cost of Converting to MARC AMC

Creating MARC AMC records, it would be wise to consider the following issues.

**Integrity of the Existing Finding Aids**

Any repository considering a retrospective conversion project should evaluate their finding aids: will dates of creation, extent, nature, and language of material be readily available from the existing finding aid? If not, will a less rigorous standard for record creation be acceptable? What logistical difficulties are posed by the need to consult the items directly? At what point will something like "original cataloging," or description directly from the manuscript or archival collection, be either desirable or feasible? If the existing finding aids are inadequate, problems and time spent will multiply.

While for retrospective conversion it is common practice to rely whenever possible on a preexisting description of the materials, often it may be necessary to consult the items themselves. Depending on the type of manuscript, single items may be converted very rapidly by direct consultation: SUNY-Buffalo coded directly and efficiently from individual manuscripts for most of the duration of the project. Direct consultation of archival and manuscript materials is most troublesome in large collections requiring considerable examination.

**Authority Work**

The procedures associated with authority work are unfamiliar to most archivists. Although some repositories may have already established authority files, many will need to begin establishing such files when they embark on a retrospective conversion project. It will be important to establish what standards will be adhered to, which files will be consulted, and in what form these files will be.

One crucial question is, how strictly should a repository adhere to national authority standards? It has been pointed out that automated systems have a "low tolerance for idiosyncrasy and individualism."19 As more and more research libraries adopt local automated systems, and as more efforts are undertaken to exchange information through machine-readable records, archivists face the option of integrating their research materials into a growing body of readily accessed bibliographic records. In order to do so, they must adopt some level of standardization, local or national. In certain cases, locally established headings may be preferred, even where a repository is using one of the national bibliographic utilities. The relative rigor that standardization imposes will have a significant impact on record creation time. Repositories with access to
PATRICIA CLOUD

LCNA online will spend far less time searching than those who use LCNA on microfiche. Another significant issue will be the number of names occurring in a given collection that are likely to be established headings in LCNA or in other local authority files.

Experience

To say that a retrospective conversion project has taken longer than expected is not to say that it was not worth the time taken; a number of benefits can result from the experience.

Previous experience with MARC format, and training of some sort in the use of AACR2 and MARC AMC are obvious advantages in any retrospective conversion project. However, the lengthy process of learning MARC AMC and AACR2, which can so dramatically affect the time required by such projects, may pay dividends long after retrospective conversion is complete—particularly if a repository decides to adopt the AMC format for its ongoing procedures. In addition, a retrospective conversion project can help identify difficulties with preexisting guides and finding aids—a systematic review and elaboration of existing finding aids to accommodate an externally devised descriptive standard can be of immense and enduring value. The same may be said of the imposition of authority files. How AMC will affect users of archives and manuscripts material, in terms of improved access, or repositories, in terms of a potential increase in user demand, remains dubious. The databases of the bibliographic utilities are not, as yet, routinely consulted by researchers, nor is it clear when or how these databases will be made directly available to patrons. Of great interest for the next several years, however, will be the measurable impact, in terms of queries and direct consultation, that may be traced to the presence of AMC records in both local and national systems.

Measuring the benefits of using MARC AMC will be as complex as measuring the costs. It is unlikely that the whole story can be forecast by any one factor—be it record creation time or increased patron inquiries—although evidence of these will be eagerly awaited.

References

1. The Online Computer Library Center (OCLC) and the Research Libraries Information Network (RLIN) are two of the largest and most influential utilities. They provide resources, primarily to libraries, for cooperative cataloging, interlibrary loan and collection management. Participants subscribe to the utilities and must meet system-wide standards for the creation of records.
Cost of Converting to MARC AMC

2. Northwestern Online Total Integrated System (NOTIS) is a software package used, generally by libraries, for control and access of MARC records. Local systems are often marketed with hardware, as well as software, and are referred to as “turnkey” systems. Local systems do not allow direct access to other institutions' databases, whereas bibliographic utilities do allow such access. For more information, see Sahli, Nancy. *MARC for Archives and Manuscripts: The AMC Format*. Chicago: Society of American Archivists, 1985; and __________. "Interpretation and Application of the AMC Format." *American Archivist* 49(Winter 1986):13.

3. This information is drawn from the grant proposal which governed the AMC RECON Project, which is not available for public consultation.


7. See reference 3.


10. See reference 3.


13. The chief source of information for single manuscripts is, as with published material, the item itself. Hensen, *Archives, Personal Papers, and Manuscripts*, p. 8.


17. The opposite effect has been noted in certain bibliographic retrospective conversion projects wherein record creation times actually increased over the course of the project due to the tedium of the work. See Peters, and Butler, "A Cost Model for Retrospective Conversion Alternatives," p. 155.

18. Northwestern University Archives calculated record creation time both incrementally and after the fact.

The Application of Microcomputer-Based Local Systems with the MARC AMC Format

FREDERICK L. HONHART

This article will consider the effects of the new MARC AMC format when applied to a microcomputer system for archival operations. Much of the basis for this article is the result of research at Michigan State University (MSU) in the University Archives and Historical Collections and the Applications Programming Division of the MSU Computer Laboratory. At this time (January 1988) over four years have been spent developing a MARC AMC format microcomputer system for use by archival and manuscript repositories and other appropriate applications. The initial version of the system was offered for sale in September 1986, but research continues to expand and enhance its capabilities. Because this is the only microcomputer-based MARC AMC format system currently in existence, discussions of various issues, of necessity, will be specific to this system.

Development of this system was a direct result of the creation and acceptance of the MARC AMC format. While the total impact of the AMC format on archival operations remains to be seen, already it has become a major factor in the operation or future operations of archives nationally, if not internationally. In contrast to other attempts to develop automated formats for archives this one had widespread acceptance well before it was even officially released in October 1984 by the Library of Congress. One reason for the immediate and widespread support of the new format (as opposed to the previous manuscripts format) was its development over a period of years by archivists for

Frederick L. Honhart is Director, University Archives and Historical Collections, Michigan State University, East Lansing, Michigan.
archival applications. Progress reports were made periodically, so the profession was well prepared for its appearance. Another reason for its acceptance is that it is supported by the Library of Congress; this means a developer or a user of an automated system designed to utilize the format can be confident it will continue to be supported in the future.

The decision by the two major library online cataloging utilities, the Online Computer Library Center (OCLC), and the Research Libraries Group's Research Library Information Network (RLIN), to implement the new AMC format in their respective systems furthered acceptance and use of the format. It is now potentially available to hundreds of archives in the country because of their membership in one of these utilities. As described in other articles in the issue, by entering MARC AMC format records into OCLC or RLIN or other online cataloging utilities, archives have now enabled researchers to search dozens and eventually hundreds or more repositories for materials pertaining to a particular area of research. The net result is that the MARC AMC format has become the de facto standard for the description of archival and manuscript records in a machine-readable format.

One alternative to using OCLC or RLIN or a similar system is to use a local system. Information created on a local system, using the MARC AMC format, potentially could be transferred to another system's database. A local system could make the AMC format available to any archival repository, not just those affiliated with one of the utilities, and it could serve as a supplemental system for those repositories having access to RLIN or OCLC.

Developing a microcomputer-based local system is possible because of a series of events in the microcomputer field. The entry of IBM into the manufacture of microcomputers profoundly affected the industry; IBM brought credibility and rationality to an industry that had been short on both. Until their entry into the field it seemed as if every microcomputer manufacturer used a different operating system. This meant that a program that would operate on machine A could not operate on machine B. IBM's use of the Microsoft Disk Operating System (MS-DOS) and the availability of MS-DOS for use by other microcomputer manufacturers—making them IBM compatible—meant that a program written for the IBM microcomputer would also operate on other microcomputers that used MS-DOS.

At that point, the potential existed to at least consider using microcomputers for archival work. Yet there was one hurdle still to be met. Initially, the storage of information on microcomputers was limited to the storage capacity of a floppy disk or generally 360 kilobytes. This was
an impractical size for all but the smallest and most limited databases. The introduction of the hard disk drive and a storage capacity of 10,000 kilobytes, or 10 megabytes, finally provided sufficient information storage capacity. Archives could now consider developing a local system for archival description and management.

For archival use a local, stand-alone, microcomputer-based system should incorporate several basic criteria—the most important of which is it should support the MARC AMC format. Failure to incorporate the format in a local system means the information cannot be exchanged with other systems using the AMC format. The system should be totally self-contained, independent of any other software or hardware requirements. The needs of archival and manuscript institutions, which are not members of OCLC, RLIN, or other bibliographic utilities, could be addressed by such a system. In order to best serve the user and the needs of the profession, a local system should be able to create MARC AMC format records for use by other MARC automated systems—that is, the records can be entered into other systems' databases for use by researchers as well as other archivists.

The development of the Michigan State University Microcomputer System, known as MicroMARC:amc, was first contemplated in early 1983. At that time a proposal was submitted by the director of the University Archives and Historical Collections for a modest university research grant to explore automated archival systems in existence or under development. The proposal was funded, and the project director visited several institutions around the country that were involved with automation. At the same time discussions were held with the Applications Programming Office of the MSU Computer Laboratory regarding the feasibility of developing a microcomputer system that could utilize the MARC AMC format. It was decided that creating such a system seemed possible, and a grant proposal was submitted to the National Historical Publications and Records Commission. The proposal was funded, and this grant, along with the financial support from the university, made the development of the system possible.

Considerable attention was given not only to the design of the system but also to the manner and development of a structure that would be utilized in creating the system. A substantial contribution to this part of the project was made by the consultant systems analyst. An advisory board of knowledgeable archivists reviewed the development of the system at appropriate times. Over a year was spent on the analysis and design of the system before any programs were written by the Applications Programming Office. A modular design was chosen for
the system. MicroMARC:amc is currently composed of four basic modules: Editor, for creating AMC records; Search, which does online searching of selected fields; Report, which will access the entire database; and the MARC 1/0 record module which inputs and outputs USMARC:AMC Format Records. The system was initially tested at the University Archives and Historical Collections at Michigan State University. Once a module appeared to meet the desired goals and was error free, it was sent to seven archival repositories for further testing (beta testing). The same testing procedure was followed for the documentation for the system.

It is interesting to look back at the initial assumptions that were made regarding the development of the system and see what changes took place and what problems occurred. Initially, the intention was to use an existing, commercial database management system for the storage of information. Upon further investigation, the decision was made to write a special database management program for the system. Such a database management system would not be a compromise, as any off the shelf system would be, and it would be more efficient, practical, and amenable to future refinements of the system. In addition, the system would not be dependent on another software manufacturer, nor would there be any need to negotiate proprietary rights to the software. A more general change has been the evolution of MicroMARC:amc into a more complex and sophisticated system than was originally envisioned—as we determined how we wanted the system to perform, adjustments were made to the original design. Those changes included allowing the user to create defaults for specified fields; to design a nonlinear form—to generate, for example, a catalog card—as well as linear output of selected information from the database; and to search the database to identify linked records.

Another factor that must be considered in any microcomputer-based system is the technological evolution/revolution that is taking place. Since beginning the development of the MicroMARC:amc system there have been significant changes in microcomputer technology, and new changes continue to take place. The basic IBM PC/XT has become more powerful; the current PC/AT configuration has up to 30 megabytes of disk storage, 1.2 megabyte floppy disks, and faster clock speed. Similar advances have been made by other manufacturers of microcomputers. New generations of microcomputers using the 386 chip are now available. In comparison to their predecessors, these machines have taken a quantum leap in operating speed and storage capacity. The result is that while the speed and capacity of microcomputers has
increased, their effective cost has decreased. Consequently, the practical availability of microcomputers has increased; repositories which in the past, because of cost, could not consider using an automated system are now in a position to do so.

There are important implications in the new developments for both software manufacturers and users. Because MS-DOS and the IBM PC/XT and compatible microcomputers have set a widely adhered to standard, it is essential for most microcomputer programs to function within such equipment/operating system configurations. Designers of microcomputer software also must be prepared to take advantage of the constant evolution in the technology so that their software will operate on future generations of microcomputers. Obviously, it is of considerable concern to users of particular programs that when they upgrade their microcomputer equipment, their software is not made obsolete.

Use of a microcomputer-based local system brings many opportunities, as well as some drawbacks, for archival repositories. The most obvious benefit is that the system is local—it is dependent only on the user of the system. A one-time expenditure for equipment and software results in potentially lower costs for operating the system. There are no monthly fixed or use charges as is the case with OCLC, RLIN, and other similar bibliographic utilities. This means that many archival repositories that could not afford to participate in established systems will now have a financially viable alternative with a local system that uses the MARC AMC format. In the future, monetary considerations should prevent only the most limited repositories from using some kind of automated system. As will be discussed, there are some excellent reasons for repositories that are part of an online bibliographic utility to consider using a local system as well.

A microcomputer system does have some inherent limitations when compared to a system that operates on a mainframe computer. In general, the speed of processing information is slower, although system design, and the size of the database, can alleviate some of the problem. Newer microcomputers now have an increased clock speed, for example, which results in faster processing of information. However, it must be realized that some functions—for example, the time it takes to read a database—will simply take longer to perform because they are being done on a microcomputer as opposed to a mainframe computer.

Another limitation is the data storage capacity. The IBM PC/XT and compatible microcomputers have a basic 10 megabyte disk capacity (which can be upgraded). Newer, enhanced machines now have disk capacity of 20 or 40 megabytes and ones of 130 megabytes or more should
be available in the near future. Add-on hard disk drives and tape backup
devices further expand data storage capacity. However, because the
information being stored is normally only for one repository and in one
format, as opposed to the contents of an online bibliographic utility,
there is not the same need for mainframe storage and processing capac-
ity. The new generation of 80386-chip-based microcomputers promises
to significantly increase storage capacity, memory, and operating speed,
making current microcomputer limitations even less of an issue in the
future operation of a local system.

If microcomputer-based local systems have some limitations, they
also have some considerable advantages for the user. When used with
the MARC AMC format, local systems should provide the user with
greater management and control capabilities because the system is
designed to meet the specific needs of archival and manuscript reposi-
tories. For example, with a local system the user can search the entire
database, not just certain fields or subfields, and the system should be
able to do this in conjunction with one or more Boolean operators. Finally, a local system will allow the user, not the system, to define
which search strategy and fields are to be examined.

In an archival repository, the hierarchical linking of records is an
important management and research function because of the methodol-
ogy used in the arrangement and description of records. The AMC
format has provisions, if somewhat limited, for identifying and linking
records. A local system should be able to utilize the record-linking
capabilities of the format and easily identify hierarchically linked
records in the database.

In contrast to large multiuser systems, local microcomputer-based
systems most likely will not impose controls over the entry of illegal
information into various fields. This is both an opportunity and a
problem for the user. The reason for this freedom is to ensure that the
user has maximum flexibility for entering records. For the software
manufacturer it is also the least costly solution to the problem of
creating records that meet the standards of other systems. The lack of
system controls over the entry of illegal information, however, does pose
potential problems. If the user contemplates transferring AMC records
to another AMC system, then care must be taken to ensure that the
records created locally meet the same standards as the system in which
they will be entered.

A local system utilizing the MARC AMC format has potential
advantages even for users of the bibliographic utilities. Records could be
written, corrected, and revised, and then, after a certain number of
Microcomputer-Based Local Systems

records had been created, they could be batch-loaded into the utilities database. Another function could be to create from the main database specialized databases that relate to specific functions or topics. These databases could be maintained solely on the local system and hard copy created when needed. The records could be changed or updated when necessary, or the entire database searched at no additional cost.

When using a local system for the creation of MARC AMC records, there are some specific factors that need to be taken into account. A local system most likely will not have any controls over the entry of illegal characters into the database. Quality control of the record becomes a user responsibility. Another consideration is the exchange of records with other systems—one of the basic rationales for using the MARC formats. If exchange is contemplated, either with one of the bibliographic utilities or another local system, then the records should meet the record requirements of the system they are to be entered into. Failure to establish minimum information requirements could result in an inability to transfer the information or in having to reenter and correct information in the database.

Applying in-house standards to AMC records should be given careful consideration by users of local systems. Two potential benefits of using the MARC formats in conjunction with automated systems are greater control over archival materials and greater access to the information contained therein. However, these benefits can only be achieved if the MARC records are entered into the system in a standardized fashion. Ideally, the system itself should have some means of checking the records for uniformity. Generating a printout of subject headings for use as an authority list is one such way to verify entries.

The MARC AMC format is complex, comprehensive, and subject to various interpretations as to the use of some fields. Only through trial and error with the format can a user become familiar with it. A local system permits the user to repeatedly reenter corrections, additions, or deletions of information with few penalties—the only cost is the time required to enter or delete information.

The advent of local, automated, MARC AMC format systems has tremendous potential for researchers as well as for archivists. The creation of the AMC format, and its growing acceptance as the standard for entry of archival records into a machine-readable format, is a major step in the development of a national information research database; the format is employed by OCLC, RLIN, and the National Union Catalog of Manuscript Collections, creating a standardized pool of information for use by researchers. Repositories that do not use one of the large
bibliographic utilities now have the capacity to create their own AMC format records. Information which otherwise would be inaccessible, or accessible on a very limited basis, once entered into and made available through larger networks, is potentially available to any researcher who has access to an online terminal connected to one of the national databases.

The sophistication of a local system in the management and control of archival records also benefits the researcher. Local systems have the potential to perform manipulations of the database that are often not practical, or possible, for large systems with an extensive number of records. Complex searches of the database will provide researchers with information about the archival records and manuscripts—such as indexes, subject lists, and collection descriptions—of a repository that otherwise would either be unavailable or not feasible to create. Local systems can meaningfully increase access to information about a repository’s archival records.

Online national databases will significantly affect not only the increase of information for researchers, but may also reduce the cost of doing research. For example, time spent traveling to examine records could be reduced and be more productive. Local systems will be an asset in this respect because materials that otherwise would remain largely unknown now have the potential to be available on a national basis. These systems, using the MARC AMC format, provide both a viable alternative and a supplement to the bibliographic utilities.

Automation and the MARC AMC format will have an enduring effect on the way archival repositories function. Both their internal and external operations will be affected and microcomputer-based local systems using the MARC AMC format will be a significant agent of change.
At the Creation: Chaos, Control, and Automation—Commercial Software Development for Archives

W. THEODORE DÜRR

The Information Revolution and the Software Developer

One day I asked a friend who publishes in medical journals to describe an ideal computer system. Without hesitation he replied, "I'd like to sit in my study at home and do the following with a microcomputer: use my word processor; retrieve notes from an indexed database; transfer them right into my composition on the word processor; if necessary, dial up an electronic database, search it, and download some data into my computer; and tonight by computer send what I've written to a friend in Boston who will read it and send his comments back to me by electronic mail so I can read them tomorrow morning."

What does my friend have in common with archivists and librarians? He generates most of his own data, rarely visits libraries, and never darkens the doors of archives; even so, this modern scholar shares a community with librarians and archivists. It is the information community. Today many people are doing what my friend wants to do in his study; not quite as easily and in one place, but soon they will. Those who use microcomputers compose articles with word processing software by entering information. They retrieve information from notes indexed and stored electronically. They enter information from these notes (that is, fields in their databases) into compositions. They search external databases and can download information from them into stand-alone microcomputers. They send information from one computer to another.

W. Theodore Dürr is a Professor, University of Baltimore and University of Maryland and Chairman and a founder of CEO, AIRS, Inc., College Park, Maryland.
Information is not a buzzword that will fade tomorrow; it is the cornerstone of the 21st century. Libraries and archives collect and control information. Hierarchical control vocabularies which reflect conceptual relationships in the specialties have been developed. Libraries and archives, historically, became the center of the learning process and scholars came to them much as pilgrims journeyed to holy shrines. No longer.

The Information Environment

Today the flow of information has reversed. At a rapidly increasing pace, information flows outward from various sources to users. This does not obliterate archivists, curators, librarians, and records managers; it merely revolutionizes their jobs.

RLIN, OCLC, LEXIS, and Dialog are prototypes of this revolution. For the most part, however, these information systems currently represent institutions communicating with institutions. The direct communication envisioned by my friend is just around the corner. Information will come directly to users on floppy disks, CD ROM discs, or over the telephone wire. This is the environment for which the modern archives and the software developer plans.

In the world of hardware development there is an explosion. In the world of software development there is an implosion. Ten years ago colleague Adele Newburger and I decided that there would never be a commercial application for text database software because it required too much memory and storage. That was before the microchip! That was the last time we failed to bet on technology. Now hardly a month goes by that does not see the introduction of significant new technological advances giving us more for less—more storage, less space—more power, less cost. William Lowe, president of IBM's Entry Systems Division stated in 1986 that "more technology for microcomputers will emerge in the next five years than in the previous five...."

While hardware vendors were fighting it out among themselves and producing one electronic miracle after another, some thought that software development might become an electronic cottage industry. A computer, a garage, and a programmer—robotic romance! Alas, it was not to be. We have entered the era of software implosion. Today consumers want software that integrates tables, text, and telecommunications. They want technology that is transparent and inexpensive. The price of software is coming down as the utility rises. Systems which cost $20,000 and up on mainframes sell for $2,000 and less in the micro market. Few garage shops can afford to compete in such an environ-
Commercial Software Development for Archives

ment. There probably will not be another Lotus or dBase story. Ashton-Tate, the producers of dBase, grew from a company deeply in debt with revenues of $3 million in 1981 to become a giant with sales of $200 million in 1986.

While the hardware and software worlds are exploding and imploding, respectively, the archival world is chaotic. New terms and acronyms abound, new demands are pressed, new functions are discovered, and new problems arise. One problem involves definition of some of our basic tasks.

At a Mid-Atlantic Region Archives Conference (MARAC) at Princeton in May 1986, William J. Joyce stated that archivists need to pay more attention to the "theory and functions of institutions. For it is in understanding bureaucratic institutional functions that we archivists achieve the strongest theoretical justification for our work." In other words, the chaos that surrounds us requires that we achieve both macro and micro views of our environment: the forest and the trees. Our practice must be redefined in light of changes in our culture. These changes are driven by technology—they are reflected in new institutional procedures and demanded by a fresh breed of scholars. Tomorrow's scholars, raised today in colleges where computers are as commonplace as typewriters, will expect information to be at their fingertips. Information will come in electronic forms such as facsimiles of documents and graphics received from all over the globe. The indexes to this material will be on disks that can fit into one's pocket and will be displayed on machines weighing under two pounds. If the opportunity is seized, we can create synergy out of the intellectual demands, the emerging technological utilities, and the new bureaucratic requirements.

Recent essays by archivists discuss time-honored subjects such as appraisal, preservation, and provenance, along with current issues such as relationships between automation and finding aids. Many of these articles are difficult to categorize as merely theoretical or practical because they both analyze from conceptual viewpoints and describe real world situations. Some examples are essays in The American Archivist by F. Gerald Ham, Harold T. Pinkett, Trudy Huskamp Peterson, Michael A. Lutzker, Richard H. Lytle, Frank G. Burke, Philip P. Mason, Meyer Fishbein, David Bearman, Charles Dollar, and Thomas Elton Brown.

While these archivists have been writing, another professional group has published articles on related topics. Known as information professionals, they write about records management, information
retrieval, telecommunications, and theoretical topics such as the foundations of information science. From one of their publications, the *Journal of the American Society for Information Science*, we read essays of this type by Derek de Solla Price, Manfred Kochen, Paul G. Zurkowski, Lois F. Lunin, Edward John Kazlauskas, G. Salton, and E.A. Fox.

The archivists and information professionals have more than a little in common. All, in one way or another, are researching and writing about some aspect of the generation, organization, storage, retrieval, and dissemination of information. Whether the information is in manuscript or on a floppy disk, various social and technological characteristics of our time impinge on their work.

The first group, the archivists, are coming to grips with a fact of our time; as F. Gerald Ham put it, while the information revolution "gives us abundant information it creates an environment hazardous to its preservation." With the coming of the microcomputer, Everyman has become not his own historian, as Carl Becker suggested; instead, as James O’Neill suggested, he has become his own records manager. In 1986 I visited a company which has inspectors who fill out various forms. Beginning in 1988 they will not fill out paper forms, rather, they will write over a piece of glass, filling out blanks on the computer screen under the glass. This will automatically go into the computer and be indexed for every word. Thus the index becomes a creation of the individual who fills out the form—no one else is involved in the entry, transmission, or storing of the information, but anyone will be able to access and display the information on an IBM XT or AT computer. The second group, the information professionals, are coming to grips with problems of definition as they discuss basic terms such as "research," "information," and "science."

No archival software developer can ignore the contributions of either group. Both comprise the environment. Nor can users implement effective uses of systems software without following the rules of the archival and information disciplines. For purposes of this article, information science (I prefer the term “information discipline,” however, “science” is universally used) is defined as the discipline that observes, experiments with, and defines the construction of automated systems which retrieve information generated and organized by bureaucracies for storage and distribution to selected audiences.

Information science helps us answer the questions “What are we doing?” “Why are we doing it?” “How are we doing it?” In the face of automation these are not idle questions. They are being addressed in
various ways through research, publication, and conferences. An archival software developer asks: How do we control records in relation to managing records per se and in relation to retrieving them on the basis of their subject content? The former approach concerns most records managers and archivists with an institutional responsibility; the latter concerns most historians, social scientists, and other researchers with information needs.

INFORMATION AND SOFTWARE DEVELOPMENT

Often, shopping for software is like buying a house. Buyers of a house designed by someone else either like it or they don't—it's too late to change it. Others prefer to hire an architect and have a house designed and built according to their specifications. Archivists are like those who demand an architect. This is true because of the absence of standardization. What one archive calls a record group, another calls a series; while one describes records only to the collection level, another describes them down to the folder, and so on. This means that each modern archivist wants his or her own custom-designed database management system.

The RLIN network is more like the mass-produced prebuilt house—archivists must fit into a predesigned format. That is, archivists must fit their information into the RLIN (MARC AMC) mold. Is there a way, asks the software developer, whereby archivists can build databases that match their own particularities but still be able to get the information out and enter it into the RLIN network when desirable? The issue here involves the MARC AMC format and data transportability.

Is there also a way to give users flexibility to design their own databases (by specifying field and record template characteristics) without requiring them to learn how to program? This is like having the privileges of the architect without the training. The issue here involves data entry and manipulation.

Is there a way, the software developer asks, to make sure that data, for example, an abstract, an ID code, or a full text, can be easily edited or appended and let the database administrator decide who has access? The issue here involves data integrity.

The software developer would also like to give people as many options as possible for searching databases. For instance, control vocabularies can be arranged alphabetically or hierarchically. Can the developer provide both options? Searching by proximity, truncation, or strings greatly facilitates certain textual needs.
There are two approaches to indexing: information retrieval and database management systems. Information retrieval (IR) software is found in packages such as Sci-Mate or InMagic. Its users are for the most part trained in bibliographic reference skills. They are familiar with mainframe database searches and serve as intermediaries between the information source (provider or vendor) and the information user. IR software grew out of the mainframe community and was usually placed in the hands of IR specialists.

Now, however, with the coming of micro power, flexibility, storage, and speed, database management, which was once the preserve of the mainframe environment, is becoming commonplace among desktop computer users. Recently a new term, “text based management system” (TBMS), has come into use. This is replacing the term, database management system (DBMS), because a TBMS has variable length fields (DBMS are fixed length), multiple value fields (DBMS are single), and produces record sorts and printouts which are more flexible than those in a DBMS. The TBMS type of software emulates mainframe DBMS functionality for text; the software packages MARCON, SIRE, and TEXTBANK attempt this, each taking different structural approaches to their program design and applications. Regardless of which of the above may be chosen, there is still a serious problem facing both developers and users. Many microcomputer desktop users are neither information specialists nor “computer jockeys.” These users want a textbase management system that is specific to their needs and can be changed at any point to better serve their needs. Since a TBMS is generic, users need software that allows them to mold and shape what it does for them, without having to become software experts in the process.

Attempts to mold and shape a program are affected by the way people go about establishing a records control system. The problem is that no two people think alike. Therefore mismatches arise when the designers of a control system and its users interpret things differently. Baruch Fisshoff and Donald MacGregor distinguish between elite user groups who search a precise database (they use the older term) and nonelites who search an omnibus database which covers various sources. An example of the former would be cardiologists or fighter pilots, each with a relating homogeneous perspective. An example of the latter would be users of Dow Jones News Retrieval or ERIC. The latter group is heterogeneous. Thus archival database design, which of necessity includes a wide array of source material (to be controlled) and, potentially, a wide array of users (to be served), must do two things. For the “elite” users, for example, who know the provenance of a collection,
Commercial Software Development for Archives

a system must offer very precise information related to offices, services, dates, and so forth. For the "omnibus" users, the system might offer more broad information related to subject. One system may encompass textbases that reflect both approaches (one elite; the other omnibus) and a good TBMS would allow simultaneous searches across both.\(^7\)

The software developer therefore tries to provide a TBMS package that is as generic as possible. But that is not enough. The administrator who builds the textbase must think through the issues involved, the applications (end result) desired, and the expectations of potential users. Careful planning at the time of textbase design is a sine qua non for a good TBMS, along with clear instructions to users once the TBMS is completed.\(^8\)

To understand software archival TBMS design, we may think of a three-tiered universe (see fig. 1). The tiers are (1) The Repository Management System, (2) The Software Management System, and (3) The User Management System Requirements.

Within each tier are four layers; each layer represents the same concept in each tier. The three tiers (and the layers within them) are interactive. These layers are: \(A\)—Objective (the purpose), \(B\)—Program (the input and throughput or how the purpose is achieved), \(C\)—Result (output or what happens), and \(D\)—Interface (expressed in each module as Information). Information is the key intellectual property, the common denominator, which is used by people involved in various roles in all three tiers. Management of information is the key to what professionals do—they manage information about records in order to manage records.

The top layer \(A\) of each tier is labeled Objective; capture, control, and use, are the key terms throughout in this level. The activity at this stage involves capturing information about the context and content of records for control of the records so that they may be used whenever necessary.

Level \(B\) in each tier is labeled Program; description, repository requirements, and software applications are the key terms in this level. This involves meeting the repository’s requirements so that description of the records will be accurate in the software applications; it further entails recognition that adequate information about a record system includes not only the subject content of the record but also information about the record’s context. Since the origin and/or “life cycle” (use over time) of records is important to their custodians, provenance related information is required. At the same time there often will be requests that are subject based. For this kind of query the user wants information
Figure 1. The three tiered universe of the text based management system.

about a given subject in all extant records. Thus the ideal system (at level B) describes records in terms of both provenance and subject content.

Level C in each tier is labeled Result; data, machine readable records, and query answers are the key terms in this level. This involves data which the repository holds (as a result of accession/accretion/collection). It is enhanced by machine readable (MR) records about the data. When the required information has been entered about the context (provenance) and content (subject) of the record, a textbase exists. Data in the computer at level C can be searched. This makes it possible for query answers. The term data is used here because the information may
Commercial Software Development for Archives

be in the form of graphics rather than text, in which case data is a broader term.

Level D in each tier is labeled Interface; information is the key word. In tier 1 this involves information about record origin, order, destination, and subject so that the MR records in tier 2 may be searched for information related to the records. Thus, information—about how to use the software, about records that meet the definition of queries, and of or about the archival records themselves—may be retrieved. An adequate retrieval system implemented with the aid of automation ultimately requires that all things be broken down to common elements.

Level D is named interface for a very precise reason. The outstanding Time Life series on the computer defines interface as "electronic circuitry that allows two devices to communicate with each other," the phrase "two devices to communicate with each other" is the heart of the definition. If the word entities (which could refer to the bureaucracy of a repository, to the computer system, or to the user) is substituted for devices in the definition, then the interface emerges as the critical component that makes everything else work. Interfaces allow one or more entities to communicate with each other. For example, imagine a conference call to 1000 participants; AT&T long lines and related equipment function as the interface. The messages communicated as people speak are the information! In our three-tier example, information is the message. In tiers 2 and 3 this information/message is put into electronic circuitry so that repository information may be communicated with facility and precision to the user.

To summarize, layer A represents the three categories that must be considered when planning an archival information system. Layer B suggests definition which outlines the parameters of a program. These two layers in tiers 1 and 2 do not directly involve the computer. The next two layers, however, are impossible without the computer. Layer C represents the actual construction of the software program, its functionality, size, operational methods, and so forth. Level D is the interface that resides in the computer. The interface pulls everything together according to the way both the database creator and end user want it.

Metaphorically, a database or textbase is an electronic garden of Eden. It can be a creation of beauty and power. Just as Adam named the animals, the modern textbase administrator names the fields and values in them; the modern researcher calls for whatever combinations of creatures are desired from the textbase. In seconds they appear on the screen.
The text software developer's task is to provide this power as fully as possible. The developer seeks to build software which allows each administrator to build a database that offers as much flexibility and power as possible for both the elite and the omnibus user. The key terms are: chaos, creation, control.

**OF MICE AND TRAPS IN SOFTWARE DEVELOPMENT**

The MIT Enterprise Forum has chapters in Boston, New York, and Baltimore-Washington. Financiers and people interested in technology attend the meetings where start-up "hi tech" companies present their technology and business plans. At one of the meetings in 1984 an entrepreneur presented an electronic mouse that made it easier to move the cursor around the monitor screen. The mouse was not a new product but this businessman thought his was better.

Members of the forum warned him of the traps that await all small businesses. The first trap involves the market. A successful business needs a market that wants its product or service. The market has to be large enough for the business to make a profit—good ideas and profits do not have a one-to-one relationship. Broadly speaking, there are two kinds of markets—horizontal and vertical. The former has many customers. In the world of dentistry this would be toothpaste, not braces; in the world of software this would be word processing, not RLIN. Firms that market horizontally seek a broad customer base and price their products accordingly. The software developer can create a ratio which compares product development cost and item sale price; the sale price is lower in relation to the development cost. In the vertical market it can be higher because volume will be lower, but if it is too high, market resistance and competition will defeat sales efforts.

The vertical market is often called the niche market. In the art world this is the market of autographs, not reprints; in software this is the market of specific applications. SPINDEX and NARS A-1 software were developed specifically for archival application. Yet no matter how valuable the applications are, the software developer must create a product that is flexible, easy to use, and inexpensive.
**Commercial Software Development for Archives**

<table>
<thead>
<tr>
<th>Flexible</th>
<th>Easy to Use</th>
<th>Inexpensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows user to define fields, database, and search strategies</td>
<td>Operates in natural language (English)</td>
<td>Price is competitive</td>
</tr>
<tr>
<td>Offers various means of entry (keyboard, OCR, electromagnetic) and retrieval (full text, string searching, Boolean connectors)</td>
<td>Provides attractive, easy-to-read screens and clear instructions</td>
<td>Updates cost much less than original version</td>
</tr>
<tr>
<td>Generates a variety of report formats</td>
<td>Operates by means of simple machine commands</td>
<td></td>
</tr>
</tbody>
</table>

The second trap involves competition. If a competing, inferior product is already for sale, or even if it is introduced at the same time but advertised more widely and effectively, the company with the inferior product will retain the market. Competition can be overt or subtle. The overt approach is when a developer tries to blast the opposition with a cheaper price, accompanied by either a sophisticated advertising campaign that may promise more than the product delivers or a cheaper price accompanied by more functionality. A subtle form of competition is when one product is able to attract funds for support and is backed to the exclusion of competing products. Probably the best form of competition is to put the product into the hands of competent reviewers. Smart software buyers know where to look for good reviews of products and reviewers' comments influence their decisions.

The third trap concerns operations. This is especially critical in software development. The software developer has to maintain research and development, production, distribution, quality control, customer support, and internal administration. Since omniscience is not bestowed on software developers any more than other mortals, frequent communication with intelligent system users is necessary to ensure that bugs are weeded out and improvements are woven in. To maintain this exchange, software developers have alpha and beta sites. An alpha site is one that uses versions of the software while it is under development. This is extremely valuable. Design modifications, manual changes, and other adjustments can be integrated as a result of real world experience at the alpha site. Beta sites are installations that use the software after it is finished but before it is released to the general public.

Winter 1988
Bugs, the perpetual pests of the software industry, are usually discovered at beta sites. While software developers test as rigorously as possible, they cannot imagine all the stresses and strains real world users will place upon their product. There is no mass-produced commercial software that never had a bug. Every time a modularly designed software program is changed, it has to be recompiled, causing the possible introduction of new bugs. Therefore, a rigorous testing protocol is necessary; at the same time, there is pressure to start shipping the new version.

Testing, evaluation, and modification, are continual efforts in the software industry. This is directly related to customer support and software improvement. Users continually offer suggestions for improvements. The trick is to recognize potentially marketable suggestions and pinpoint technological breakthroughs that can facilitate viable new enhancements.

The fourth trap involves finance. There is no hope for a firm whose sole market is archival repositories. The total market potential among archives is about 3,000 repositories. If the product is software, the customer base, in 1987, is cut in half because many archives are not ready to automate. Since the lead time—that is the time it takes a customer to decide after being introduced to the product—is between six months to one year, the potential customer base for the first year reasonably comes out to about 750. If the competition factor is added, the potential is advisedly narrowed to 375. If the product sells for $1,000, and requires $4,000 worth of hardware and related equipment, the number might again be reduced by half to 188 or $188,000 in sales. Since the software will cost at least $300,000 to develop and support (not to mention advertising and distribution), no one would take such a risk. The software developer must have a larger agenda, a bigger market in mind.

First, the developer may "add value" to an existing mass distributed product. For instance, if the developer's software can make WordPerfect function better by automatically indexing text then users of this widely distributed product may buy the software, and WordPerfect may distribute it. This puts the sales organization of a major software firm to work for the small developer. This is known as a VAR (Value Added Reseller) relationship. Another tactic is to have the software "bundled" into another product. For instance, if a producer and marketer of a CD-ROM database requires a text filer and indexer, the developer can execute a license agreement with the company selling the database and reap royalties on every sale. This is known as an OEM (Original Equipment
Commercial Software Development for Archives

Manufacturer) relationship. These and similar techniques will broaden the market base and may lead to survival.

The archival software developer has another problem which will not be solved without CD ROM (Compact Disk-Read Only Memory). When information is communicated on paper (excluding graphics) it is either in numeric or script symbols. In the world of automation there is a vast difference between the two. For example, the number 5,465,025,015 requires 13 bytes of storage in its numeric form. On a double-sided double-density disk which has room for 360,000 bytes, this is not much. On the other hand, 5,465,025,015 words (averaging 6 letters each) would require 38,465,115,105 bytes of storage or 106,264 floppy disks! This explains why, before the invention of the microchip, most databases were numeric.

Only with the chip have text databases become feasible. A megabyte is one million bytes. Microcomputers with 80 megabytes of storage are common today and computers with over 100 megabytes of storage are not uncommon. When large volumes of text are stored, an index becomes necessary. This adds to the storage problem because the index, too, takes up space. While a hard disk of 30 to 60 megabytes will often suffice, the new CD ROM technology most adequately addresses the problem. CD ROM is similar to the small, compact or digital disc used in the music record industry. As an archival device, one 5¼" CD ROM disc will hold 500 megabytes. An entire encyclopedia will fit on a 12½" disc holding one gigabyte (one billion bytes). Obviously indexing software is a sine qua non for using this much data.

Solving Software Dilemmas

The software developer can do all of the above and more. Decisions, however, involve tradeoffs. The more options a software program offers, the greater its size. The larger the program, the more space it requires. The more space, the longer the search, or, if the search time is to be shortened by certain techniques, then the indexing time is increased. Software is like putty. If you push it a little here, it comes out a little there. Software can do just about anything given space and time. The tradeoffs are between function, time, and space.

Building good software and databases is an art. For that art to be fully appreciated, the product must be used correctly. As the demand for text- and records-control software grows, many customers will be neither information scientists, reference librarians, nor archivists. The librarian and the archivist, furthermore, may know little about database construction. Inappropriate uses of the software may result. A good
manual and tutorial are often not enough; the solution resides in workshops and seminars. It is worthwhile for the purchaser to invest a little more time and money in order to learn to use the product correctly and it is worthwhile to the developer to make the cost as reasonable as possible.\footnote{11}

Most software firms have long lists of ideas and short lists of resources. The chief of technology and development for one software house always says that he will deliver anything given time and money. When creating a budget, the developer must remember that programmers tend to underestimate the time required to complete a project and marketers tend to overestimate sales projections.

Whatever the business strategy and the survival techniques, the small firm has to back up its product, deliver on its promises, and manage its resources well. The developer may have a dream which envisions thousands of people using the firm’s software but the dream must not cloud the developer’s eye to hundreds of details which have to be managed on a daily basis. At the same time, the details cannot be allowed to decimate the dream.

References

2. In May 1986, the WordPerfect corporation published a “Library,” an integrating tool box which locates programs in various subdirectories and with a “Notebook list management program,” allows users to move data around via a “clipboard.” Another product, MacPik, is a utility that inputs files of one type and outputs them as other types, allowing communication with downloaded files. See Lowe, William. *Infoworld* 8(7 July 1986):32, 37.
3. Ham, F. Gerald. “Archival Strategies for the Post Custodial Era.” *American Archivist* 44(Summer 1981):209. We probably do not want to store so much information. Knowledge, which is information in context, is what we need to store. Learning to differentiate between the two is one of the tasks ahead.
8. Work in this context leads, ultimately, to artificial intelligence. Key terms for searches are: rule based systems, knowledge bases, decision support systems, expert systems. The author assumes no responsibility for those who, outward bound, get lost while trying to follow the trail.

9. The two words "data" and "base" were standardized to one word "database" in the Annual Review of Information Science and Technology (ARIST) in 1979. The same, presumably, will happen to "text" and "base."


Increasing Access to Archival Records in Library Online Public Access Catalogs

MATTHEW BENJAMIN GILMORE

Now that archivists are becoming more familiar with using the US MARC (United States MAchine Readable Cataloging) formats for describing archival materials, they are in a position to capitalize on those formats' capabilities for data transfer by integrating machine-readable descriptions of their holdings into wider information systems. While Thomas Hickerson's article in this issue is concerned with the use by archivists of national and regional bibliographic utilities such as the Research Libraries Information Network (RLIN) and the Online Computer Library Center (OCLC), this paper will look at the use of institutional online public access catalogs (OPACs). It will review the utility of call-number searching and will then discuss some possible archival applications. In particular, the Wallace Archives, in the Honnold Library in the Claremont Colleges, is used as an example of where bibliographic descriptions of multiformat archival materials are available online through the library catalog, and where access has been increased to those materials using subject headings, date, and format in conjunction with call- or classification-number searching.

Subject Searching Using OPACs

The problem for any reference professional, be they archivist or librarian, is to turn a "fact" question into a "which source" question—that is, to take the patron's query, a request for a fact, and to determine
which source out of those available will best supply that information. Librarians have constructed a variety of access points to materials and their intellectual contents to make this task easier and have disseminated these points through their manual and online catalogs. Cataloged books have four chief points of intellectual access: title, author, subject heading, and call number. Before automation of the library catalog and shelflist, a searcher needed to know at least one element of these (that is, first word of the title, or subject heading, or the author’s last name) and its correct form according to established cataloging rules in order to locate a desired item.

Today, when searching an online public access catalog that has keyword searching and truncation capabilities, the user need not know the entire name, title, or subject heading to retrieve relevant references. The constraints that remain, however, are still those of a controlled search vocabulary—that is, an insistence on correct or standardized spelling of titles and subject headings and a knowledge of exact name forms (particularly those derived from Library of Congress Name Authorities or established according to the Anglo-American Cataloguing Rules, 2d ed.). Common and “stop” words (articles such as “an” and “the” or prepositions such as “with” and “to”) must also be avoided. A search constructed using frequently occurring terms, which generates a large response, can defeat even the most sophisticated systems and cause great frustration to the patron.

The University of California, Los Angeles (UCLA) ORION online catalog, for example, will give nothing but an “overflow” message should the subject search “United States history” be attempted, no matter in what order the words are entered. This is because the concepts used to generate the retrieval sets are too large for the computer to manipulate gracefully, and unlike the card catalog, it is almost impossible on most OPACs in operation today to browse through just a few of the references retrieved.

This is a matter of concern to archivists who have been dubious, since the first discussion about integration with library systems, of the requirement of most bibliographic information systems that archival records coded in a MARC format contain at least one Library of Congress Subject Heading (LCSH). This requirement means that archivists frequently must use a very general heading rather than the specific local thesauri or otherwise controlled vocabularies which archivists have developed to describe their own materials. In a case where archival materials are entered directly into an OPAC, and not into a specially designed archival subsystem, the vague nature of many collection titles
and the general subject headings may result in those materials disappearing into a void; they could be lost in a computerized catalog that can only be searched by traditional access points.

More intellectual access points must be made available. As patrons and staff are gradually becoming aware, particularly through their contact with various types of automated retrieval systems, automation requires different and alternative strategies for subject searching from those used when performing a manual search. The most sophisticated OPAC users, such as reference librarians, will frequently use a rough "subject" search by using keywords in a search for a hypothetical title; their assumption is that the title will correspond with the subject. The full bibliographic records for titles retrieved this way (excluding the inevitable "false drops") will indicate the approved subject headings assigned by the cataloger. These headings can then be used in a real subject search option to locate more material. The rough search also reveals the classification numbers which predominate for the subject. Reference librarians will often send a patron to the stacks or the shelflist with the injunction that more books on the same subject can be found with similar call numbers on the shelves near the title(s) already located in the catalog. At UCLA librarians can demonstrate this feature to the patron by searching by call number in the ORION online catalog, although this option is not yet available on patron terminals.

Call Number Searching in OPACs

Call number access has led some proponents of online catalogs to conclude that call number searching would be useful to the patrons as well as to the librarian. Karen Markey, working with the Dewey Decimal Classification (DDC) scheme, emphasizes the implementation of automated classification number searching as "a major source of unique subject-rich terms that enhance subject access to bibliographic records." One of her major recommendations was to mount the entire DDC schedule online so that the patron's subject could be matched against the classification number used in the schedule. In summarizing her research, Markey found that subject searching was by far the most common use of the online catalog, even in those catalogs lacking formal capabilities to perform such searches. An alternate means of facilitating subject access is the use of the classification number. However, user ignorance of the subject significance of call numbers must be overcome. Most patrons simply see the call number (either library or archival) as a location indicator and have no idea that it might also pertain to the subject.
To rectify user ignorance, user aids should be created, probably in a thesaurus format which would clearly link a subject with its classification number. If the guides were available online, a classification number could be generated in response to the patron input of any subject term; Markey suggested this solution in 1983. For example, when the patron searches for "Islam-addresses, essays, lectures," the OPAC would respond with the number of titles retrieved accompanied by the truncated call number DT4.5

Nancy Williamson and Lois Mai Chan have both studied the Library of Congress Classification (LCC) scheme as a tool for online searching. Williamson suggests that implementation of a thesaurus format is the direction that research should take in order to allow user exploration of hierarchical construction of the classification.6 Chan points out that the enumerative nature of LCC is an advantage in online searching since each number contains rather specific subject information.7 An advantage that LCC numbers have over DDC numbers is that they are short and, therefore, are usually applied similarly in a variety of libraries. This leads to little variation from library to library, as opposed to Dewey numbers which are often truncated.

Both Williamson and Chan favor mounting the entire classification scheme onto a subsidiary database, rather than relying simply on the call numbers of the records present in an existing online catalog. A similar idea is the development of a subsidiary database, dedicated to locally or nationally established authority files, which can be searched independently of the archival records (this was undertaken by Geac in the Smithsonian Institution archival subsystem).

An advantage to searching with LCC is that one has greater search precision—and therefore, fewer "overflow" responses—than by using the regular subject search option. This is particularly important when dealing, not with a localized archival database containing perhaps a few thousand records, but with a system-wide database of online information which might contain several million records. For example, searching records E178.A1 through E178.3.Z9 to retrieve references to materials on U.S. history is feasible whereas searching the subject term "United States history" is impossible. Of course, numerical searches would be even more useful if the retrieval set could be narrowed by specifying archival materials only or archival classification numbers only. Call number searches are actually more accurate than title "subject" searching because there should be no false drops unless an item has been misclassified by the cataloger.
Janet Swan Hill highlights several drawbacks to online classification searching, however. She notes changes in DDC over the years, local inconsistency in schedule application, or local multiplicity of systems (for example, a mixture of local, DDC, and LCC), and the failure of the call number and subject to correspond due to misclassification. The capability to browse the shelves from a computer terminal is a compensating advantage which would benefit reference archivists in those instances where shelving corresponds to classification number. (This is not always the case, however, and additionally, most archives do not permit patrons into their stack areas.) Like Chan, Hill also recognizes the rich subject content of the two classification systems, particularly that of LCC which has schedules occupying six linear feet.

Archival classification schemes are usually locally devised, based on provenance, and hierarchical in nature. Some sophisticated schemes specify four or more levels of detail—form division, section, and office, to media and format. These schemes would provide a useful source of information about archival holdings in an OPAC where some of the other MARC fields, which are directly searchable on local archival systems (such as media or format), would not be supported or available.

Online Classification and Reference Coding Retrieval

Despite the active research in the field of librarianship, little attention has been paid to applying classification- or reference-coding searching to automated records of archival materials. Many, if not most archives, of course, are not yet online with a local OPAC, and many do not use what they would consider to be classification numbers. At UCLA, for example, the existing classification scheme in the University Archives grew unwieldy through neglect and it is no longer used. Instead, a unique accession number is assigned to each series. However, integration and support of the library OPAC can be very desirable, particularly for small archival collections that fall under the part-time control of a librarian. Any mnemonic shelf location reference coding or classification system could be implemented online as an additional access point, providing records were in a MARC format acceptable to the OPAC and some method was used to control record length. In this, the Wallace Archives can serve as a model.

Background

In 1983, Irving Wallace donated his personal papers and collection of publications to the Claremont Colleges to be housed in Honnold
MATTHEW GILMORE

Library Special Collections. Wallace, a best-selling novelist, and author of such works as The Fabulous Originals, The Sins of Philip Fleming, The Chapman Report, The Man, The Plot, The Prize, and The R Document, also coauthored with his wife Sylvia, son David Wallechinsky, and daughter Amy, The Book of Lists series and People's Almanac series, and until 1953 wrote short fiction and nonfiction articles which were published in national magazines. In that career, which began in 1931 with the precocious sale of his first article (Wallace was 17), he conducted many interviews with celebrities including Alexander Kerensky, Marlene Dietrich, and Pablo Picasso. Many of his books have been adapted to the screen or for television, most recently The R Document.

In his agreement with the Claremont Colleges, Wallace donated all drafts and notes of approximately twenty-five books written by him, all correspondence, contracts, business records, review files, corrected galleys (foreign and domestic), all original research materials, and copies of all the books in all the languages in which they were printed. Also included are research materials and manuscripts of some 500 short stories, magazine articles, interviews, and approximately seventy-five videotaped interviews with Wallace, some running to two hours in length. At present, the growing collection consists of approximately 3000 unit cataloging descriptions, ranging from single items to boxes of research material, envelopes of photographs, and groups of videocassettes.

To enable Wallace to have access to his own papers, the library cataloged them on a subsidiary database of the library's Total Library System (TLS) online catalog. Since the donation included a wide range of materials from pre-print to published works, including outlines, manuscript drafts, galleys, correspondence, private journals, contracts, review files, books, articles, screenplays, promotional items, and audio- and videotapes, all by Wallace and his family, and many with the same title, not only was a classification scheme necessary, but so, too, was a format designation.

Classification Scheme

Fifteen categories of material were devised by Honnold Library catalogers, each with a two-character mnemonic code (see fig. 1). This collection is organized around Wallace's books, the principle being collocation of all material relating to each published work, no matter what format. Original order is not respected, but provenance is maintained. Each book is given a code number, consisting of the first
Figure 1. Fifteen Categories of Material (Source: Honnold Library. "Irving Wallace Collection Classification Scheme." Unpublished, 12 April 1983, p. 4).

two letters of the first significant word and a number representing the third letter. This code will allow for the insertion of new titles with the same first two letters of the first word (see fig. 2).

A character was assigned to each of the Wallace family authors: A for Amy Wallace, D for David Wallechinsky, I for Irving Wallace, and S for Sylvia Wallace. W was assigned to collective projects. Together with the dates and the W location code for the Wallace Archives, those three

Figure 2. Codes Assigned to Each Book (Source: Honnold Library. "Irving Wallace Collection Classification Scheme." Unpublished, 12 April 1983, p. 4).
elements—format designation, title code, and author character—make up the call number equivalent. This is accepted by Claremont Colleges Total Library System as one long call number.

Each book that the TLS receives has either an LCC or DDC call number assigned using OCLC. As the Claremont Colleges system has several libraries and a multitude of locations in each, and as the computer does not allow duplicate numbers, a location designation is necessary to make distinctions between like or multiformat materials. This distinction takes the form of a five character prefix code (see fig. 3).

The initial character stands for the library, in this case Honnold. The Wallace Archives uses $W$ instead of $H$. The second character stands for the location in the library, such as $S$ for Special Collections. This is left blank for Wallace. The third is a format designation—"." for regular size, "-" for folio, "*" for reference folio, "[" for double oversize, and "]" for miniature. Wallace cataloging fills this and the next space with the two character format mnemonics described earlier. The fourth and fifth positions are used for a third level of specificity for collections in certain locations in each library, for example $OX$ for the Oxford Collection in Honnold Library Special Collections.

The Wallace materials are cataloged at the item level, except for the background research materials for the books which are described at collection level. The MARC Books (monographic) format was used since the AMC format was not available when cataloging was started and the extra fields of the AMC format were not needed when the format was finally issued. Each item cataloged is given a unique bar code, which is a system requirement for the original circulation system. Figure 4 shows some sample records from the Wallace TLS Database.

**Retrieval**

The purpose-designed, segmented call numbers designed for the Wallace Archives allow for a variety of searches, from the broad to the

```
H . DA 400.A5 B5  Honnold Library Open Stacks
HS.OXDA 400.A5 B5 Honnold Library Special Collections
       Oxford Collection
HS-OXDA 400.A5 B5  Honnold Library Special Collections
       Oxford Collection
       folio
```

Figure 3. The Five Character Prefix Code (Source: Total Library System database)
precise. Particular books can be located in the various stages of production, beginning with research material all the way through to screen adaptation. Classification number searching is particularly helpful in the case of the Wallace Archives since, with almost all the material being authored by a member of the Wallace family, an author search would be too broad. It also provides a solution to the difficulty presented by the many manifestations of each work. Instead of having to search through the works of each Wallace or through every format of a title, specific aspects can be readily retrieved. Figure 5 shows how the searcher can retrieve on the format designation and on the book title code. Searching is possible in a shorter form, without the location/format designation, and such a search would retrieve everything with the Cutter number input, regardless of format (see fig. 6).

**Implications**

While virtually all the Wallace materials are cataloged item by item using the MARC Books format, the same principles can be extended to those described at the collection level using MARC AMC format, if a mnemonic or otherwise meaningful reference code is assigned to the collection. The searcher could begin, as do most patrons, by searching for known subjects or names in the OPAC. Retrieval would then reveal a reference code which could be used to search the collections; the process should emulate a patron reading the classification scheme for record groups or the summary record series description, or browsing the shelves. This capability would be enhanced if the collection were cataloged at series and box level (where each box contains discrete materials), so that the patron could browse box descriptions from the terminal.

Richard Lytle has shown in his work that traditional cataloging methods in archives (using either provenance or content indexing) have no significant affect on retrieval success. His conclusion "that both methods performed poorly was drawn by measuring overlap, the degree to which both methods found the same relevant folders in the collections; in other words, it is likely that many relevant folders were not retrieved. Another way of stating this is that neither method is very consistent or reliable, as measured by the overlap."\(^{11}\) It is possible that implementing online access by classification scheme as an additional indexing method might help to improve this low rate of retrieval.

By taking advantage of the research done by scholars like Karen Markey, Nancy Williamson, Lois Chan, Janet Swan Hill, and Elaine Svenonius, archivists can add another significant, powerful, point of
MATTHEW GILMORE

Sample Records

W MSILE 8 1943A [W=Wallace, MS=Manuscripts, I=Irving, LE=Letter..., 1943A=date]
Wallace, Irving.
A letter from Australia [typescript]/by Irving Wallace.
1943.
7 leaves ; 28 cm.
Photocopy.

World War, 1939-1945
Football
1943
Foreign Service
barcode: 10010827339

W MSICO 5 1945 [W=Wallace, MS=Manuscripts, I=Irving, CO5=Columbus..., 1945=date]
Wallace, Irving.
Columbus was wrong [typescript]/by Irving Wallace.
1945.
21 leaves ; 28 cm.
Photocopy.
"I finished this article on Wilbur Glenn Voliva and Zion City on Oct. 11, 1945. It finally sold to True magazine where it appeared combined as 'When Zion blew its top'—April, 1946 issue. However, I used most of it with revisions in chapter I of my second published book, The Square Pegs, published in 1957 by Alfred A. Knopf."—I.W., Nov. 12, 1984.
Voliva, Wilbur Glenn.
Zion City, Illinois.
1945
True
Square Pegs
Alfred A. Knopf
barcode: 10010827338

W FRIOD 4 1936 [W=Wallace, FR=film related, I=Irving, OD4=Oddity..., 1936=date]
Wallace, Irving.
Oddity Hunter [film treatment]/by Irving Wallace.
1936.
6 leaves ; 28 cm.

Figure 4. Sample Records (Source: Total Library System database) (cont. on page 619)
Library Online Public Access Catalogs

Carbon copy.
"Only existing carbon copy of retyped final version of my first movie original story, finished in February, 1936."—I.W.
Curiosities and wonders
William Morris Agency.
barcode:10010827337

W ZZIOB 4 1972 [W=Wallace, ZZ=Miscellany, I=Irving, OB4=Obituaries, 1972=date]
[Obituaries] [Clippings]
19 items: ports.; 17-36 cm.
"Obituaries of friends and writing or publishing associates."—I.W., June 8, 1985.
Clippings of obituaries of IW’s friends in publishing, writing, film, etc.
Obituaries.
barcode:10010827341

Figure 4. Sample Records (Source: Total Library System database)

access to their online databases. Reference codes, based on an archive organized according to provenance and revealing the structure of records arrangement, would allow patrons to scan the related record series as if they were searching inventories. Format designations could be helpful in retrieving archival material, particularly if applied within a collection—for example to a box of photographs in a collection of personal papers. In fact, the formats designated for the Wallace Archives could be extended to include any type of format likely to occur, such as scrapbooks, photograph albums, and any kind of realia.

The AMC format has a genre/format field 655, as well as a field for classification numbers, and, if it proves feasible on a local system, archivists could use these as searchable fields in the holdings database, allowing for more precise searches and easier retrieval of materials. A survey of MARC AMC users indicated that all of those questioned already use the 655 field in conjunction with various thesauri, including LCSH. The survey responses also indicated that this helped with specialized retrievals, for example, locating materials for an exhibit. Given the facts that these data are already in existence for collections coded in MARC AMC, that many archives have well-defined classification systems which they use with a variety of in-house manual and
MATTHEW GILMORE

Sample Searches

The user inputs the TLS code for location searching, and the computer responds with the prompt:

  LOCN.SS++++.++ C99 ------- AA.

The user then inputs the Wallace call number of whatever fraction would be useful.

• Searching using location code (just the five characters)
  LOCN.SS++++.++ C99 ------- AA (the computer prompt)
  W CRA
retrieves all critical material (review) (CR) on Amy Wallace (A)

  LOCN.SS++++.++ C99 ------- AA
  W CSD
retrieves all correspondence (CS) of David Wallechinsky (D)

  LOCN.SS++++.++ C99 ------- AA
  W PPI
retrieves all preparatory prints (PP) for books by Irving Wallace (I)

  LOCN.SS++++.++ C99 ------- AA
  W BGI
retrieves research (background) material (BG) used by Irving Wallace (I)

• Searching using location code and cutter (five characters and book code)
  LOCN.SS++++.++ C99 ------- AA
  W BGICH 3
retrieves all background material (BG) on The Chapman Report (CH3)

  LOCN.SS++++.++ C99 ------- AA
  W MSSFO
retrieves all manuscripts (MS) of Sylvia Wallace’s (S) The Fountains (FO)

  LOCN.SS++++.++ C99 ------- AA
  W PRIBL 2
retrieves all promotional material (PR) on The Book of Lists 2 (BL2)

Figure 5. Sample Searches (Source: Total library system database)

The user inputs the TLS code for call number searching, CC, and the computer responds with the prompt:


Sample search

• Searching using the book code (without the location code)
  SS++++.++C9
  AL 6
retrieves all material on Wallace’s The Almighty, whatever the format.

Source: TLS Wallace database.

Figure 6. Source: Total Library System database

620
automated systems, and that archivists are now looking increasingly to integrate information on their holdings into local online catalogs, the argument for implementing classification access is a persuasive one.

ACKNOWLEDGMENT

The author acknowledges the help of those UCLA Graduate School of Library and Information Science faculty who read and commented on this paper.

References


MATTHEW GILMORE


Additional References

International Labor and Working-Class History
Linking labor historians throughout the world, *International Labor and Working-Class History* presents new scholarship on some of the most vital issues and controversies in the field and fosters comparative thinking and research on working-class movements in a way that no other journal does. Issued twice a year.

Subscription price: institutions, $20.00 ($26.00 foreign); individuals, $12.00 ($18.00 foreign).

Law and History Review
*Law and History Review*, published by the University of Illinois Press for the American Society for Legal History, is the leading American journal in its field. Now in its sixth year, it features articles on a broad range of subjects, including American, English, European, and ancient legal history. Each issue includes essays, commentaries, and book reviews on subjects of legal historical interest by authorities in the field. Issued twice a year.

Subscription price: institutions, $45.00 ($48.00 foreign); individuals, $25.00 ($28.00 foreign).

Journal of the Abraham Lincoln Association
The only journal devoted exclusively to Lincoln scholarship, this annual is published by the University of Illinois Press in cooperation with the Abraham Lincoln Association. The journal publishes selected scholarly papers presented each year at the Lincoln Symposium in Springfield, Illinois, and also features photographs and newly discovered Lincoln letters and documents. Its "Lincolniana" section informs readers about new Lincoln books and articles. Issued annually in December.

Subscription price: $15.00 ($18.00 foreign).

UNIVERSITY OF ILLINOIS PRESS
54 E. Gregory Drive, Champaign, IL 61820
217-244-0626
America's Music
From the Pilgrims to the Present
REVISED THIRD EDITION
Gilbert Chase
With a foreword by
Richard Crawford and a discographical essay by William Brooks
Gilbert Chase's monumental work remains the definitive account of music in America. First published in 1955 and subsequently translated into French, German, and Spanish, America's Music has long been regarded as a classic. This updated third edition is completely rewritten. Here Chase broadens his scope to devote greater attention to jazz, folk music, and popular music, among other topics.
"Every student and scholar of the subject is indebted to this landmark book, in countless ways." — Charles Hamm, Music in the New World.
736 pages. Illustrated, $29.95*

Bibliographical Handbook of American Music
Donald W. Krummel
This comprehensive guide examines over 750 bibliographies of books, periodicals, and other writings about American music, as well as lists of musical compositions, their titles, scores, and recordings, from 1698 to the present. Through his annotations and systematic arrangements according to periods, communities, repertories, and mediums, D. W. Krummel provides an overview of the literature of American music.
"A fine introduction for beginning scholars, librarians, or interested readers — historians, library school students, and ethnomusicologists, as well as students of American studies, jazz, popular culture, and regional studies." — Dena J. Epstein, author of Sinful Tunes and Spirituals.
$24.95*

*A volume in the series
Music in American Life

University of Illinois Press
© CUP Services • P.O. Box 6525 • Ithaca, New York 14851
COME JOIN US!

The Society of American Archivists wants you as a member. We rely on the input of new members to keep SAA vital, dynamic, and in tune with the needs of the archival community.

What are the benefits? SAA has two types of members — individual and institutional. Both receive the quarterly journal, The American Archivist, the bimonthly SAA Newsletter, an annual meeting program, and discounts on all Society publications and annual meeting registration. Individual members are also eligible to participate in the Placement Service and to join two SAA Sections.

What does it cost? Individual membership dues are graduated based on salary (see below); institutional memberships are available for $65 per year.

We hope you'll decide that SAA is the professional association for you. If you do, fill out the form below and return it with your check to SAA headquarters. Information on Sections and the Placement Service will be sent on request. Non-archivists interested in associate membership should contact SAA headquarters for information. Come join us, and find out what you've been missing!

---

**Individual Membership**

Name ________________________________

Address ________________________________

City, State, Zip __________________________

Is this your business address? Yes No

Employing institution __________________________

Business phone ____________________________

---

**Institutional Membership**

Name of institution __________________________

Address ________________________________

City, State, Zip __________________________

---

**Subscription** (Subscribers receive the American Archivist only; only institutions may subscribe to the journal.)

Name of Institution __________________________

Address ________________________________

City __________ State ______ Zip ______

Mail form with payment to SAA, 600 S. Federal, Suite 504, Chicago, IL 60605.
Procedures for Proposing & Guest Editing an Issue of *Library Trends*

Scope

*Library Trends* focuses on library and information science topics of interest primarily to practicing librarians and information scientists and secondarily to educators and students. The style and tone of this quarterly are formal rather than journalistic or popular. *Library Trends* issues review the literature, summarize current practice and thinking, and evaluate the directions practice is taking. Papers must represent original work, published for the first time in *Library Trends*. Extensive updates of previously published studies are acceptable, but revisions or adaptations of published work are not sought.

Processes of Proposing and Publishing

An issue editor proposes the theme and scope of a new issue, draws up a list of prospective authors and articles, and provides short annotations of the articles' scope or else gives a statement of the philosophy guiding the issue's development. The issue prospectus is examined by the Graduate School of Library and Information Science (GSLIS) Publications Committee and requests for clarification or modification may be made before the prospectus is approved.

Once the prospectus is approved by the GSLIS Publications Committee, the issue will be scheduled for publication and the issue editor begins by inviting authors to write for the issue. The Publications Office will alert the authors to issue deadlines and will send them "Instructions for *Library Trends* Authors." The issue editor also will be sent a copy of the instructions along with "Suggestions for *Library Trends* Issue Editors." The suggestions are culled from our experience in editing and dealing with questions raised by issue editors and authors. Included are the typical stages an issue passes through; responsibilities of the issue editor; the responsibilities of the Publications Office editorial staff; and the typical timing of the writing, editing and production stages. Generally, it takes 1-2 years from proposal to publication.

Soliciting Readers' Ideas

We publish *Library Trends* using theme suggestions of GSLIS Publications Committee members and our readers. We welcome ideas for issues and for writers that our readers would like to hear from. We also encourage readers to volunteer to be issue editors or to suggest others who may be willing. Please write us with your ideas or inquiries: GSLIS Publications Office, University of Illinois, 249 Armory Building, 505 E. Armory Street, Champaign, IL 61820 or call: James Dowling (Managing Editor) at 217/333-1359 or F.W. Lancaster (Editor) at 217/333-3280.
Library Trends

Forthcoming numbers are as follows:

Spring 1988, *Library Literature in the 1980s*. Editors: Patricia Stenstrom, Library and Information Science Librarian, University Library, University of Illinois at Urbana-Champaign; and Dale Montanelli, Director of Administrative Services and Assistant Professor of Library Administration, University Library, University of Illinois at Urbana-Champaign.


Fall 1988, *Linking Art Objects*. Editor: Deirdre Stam, Assistant Professor, School of Information Studies, Syracuse University, Syracuse, New York.