January 1981

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COMPUTERS, ARCHIVAL ADMINISTRATION, AND THE CHALLENGES OF THE 1980s

Richard M. Kesner

A mere decade ago, it would have been difficult to conceive of the situation which now confronts the archival profession. In the late 1960's and early 1970's, only a few federal and state agencies collected, preserved, and serviced machine-readable records. In the last ten years, the number of agencies serving as electronic data processing (EDP) archives has significantly increased. While the management of machine-readable records remains principally in the hands of a small group of specialists, there are now encouraging signs of change, or at least of the growing awareness regarding the problems faced by the archival profession as a whole in managing these modern documents. Similarly, we have witnessed the emergence of automated systems, such as SPINDEX and SELGEM, specifically structured for the indexing and retrieval needs of archives and records management programs, as well as the persistent efforts of the MARC Development Office of the Library of Congress to design a usable MARC manuscript format.

To date, progress in both the establishment of EDP archives and of archival automated systems has been slow, and certainly none of the recent events described above could be cited as harbingers of a new era in which automated techniques and records would serve as overriding, or indeed predominant, professional issues. And yet, in the last five years, archivists have become increasingly aware of the potential benefits of automation in improving archival operations and services and have witnessed the advent of machine-readable records as an important and even ubiquitous documentary source.
What has caused this change among archivists? What do archivists need to do as a profession to prepare for the cybernetic age? And what does the future have in store for archivists? A three-fold model illustrating the development of the role of computer technology in the archival profession best answers these questions.

In the first stage, which is largely complete, archivists accepted the need to deal with the problems of collecting, preserving, and accessing EDP records and took up the challenge of adapting EDP capabilities to the requirements of the profession. The second stage of the model—that of education—is the present concern of archivists. Finally, archivists must move from the present period of study, experimentation, and evaluation to the third stage of application, an era of full implementation of automated techniques and technology.

In the early 1970's, the trend within the archival profession towards an acceptance of EDP applications in archives was far from apparent. By the end of the decade, however, this situation had changed dramatically. A poll of the Society of American Archivists (SAA) taken in December, 1979, clearly demonstrated a shift within the profession regarding the role and potential significance of the computer. When asked to list the five most pressing problems that they as archivists anticipated in the next five years, forty-five percent of those polled listed technological change as the major challenge in the years ahead. This dramatic shift of interest towards automation has also manifested itself in the offerings of professional workshops and meetings. The demand for more comprehensive training in the management of machine-readable records and automated techniques speaks persuasively for the argument that, as a whole, archivists are becoming more aware of and are accepting these trends within the profession.
Many factors have contributed to this remarkable transformation. First and foremost among these is the growing use of computers in our daily lives and the concomitant growth in the quantity and diversity of machine-readable records generated by modern society at the expense of more traditional paper records. Government offices at all levels and business concerns, for example, annually automate a greater percentage of their records, dictating the establishment of EDP tape libraries and the employment of computer-generated micrographic records in any number of different administrative operations. Schools now offer training classes for grade-school children in computers, and even out-of-school adults cannot entirely avoid a certain degree of exposure as their employers automate. Greater contact with computers has led in turn to a diminution in popular resistance and has encouraged a greater awareness of automation and its potential.

These developments have had a special impact upon archivists, altering our perceptions of our responsibilities. As business and government—and to a lesser extent universities—turn to automated records and accounting systems, archivists face the need to reconsider their approaches to accessioning, management, processing, and description. EDP archives have also raised new ethical and legal questions concerning patron access and donor privacy. And archivists are increasingly faced with the need to learn more about the systems that generate these records in order to appraise their evidential and informational value more effectively. Thus, regardless of their previous interests in the area of automated records and techniques, many archivists are finding themselves in a situation where they are obliged to become EDP specialists.

Sixty-one percent of those polled by SAA in 1979 also expressed concern over an anticipated decline in the financial resources of archives in

Published by DigitalCommons@Kennesaw State University, 1981
the years ahead. Many of these same professionals work in library, business, or government settings and have observed the tangible savings, especially in staff time, experienced by other departments within their institution as they automated. For example, in college and university libraries, from which the SAA draws a significant portion of its membership, it is no longer uncommon to find acquisitions, cataloging, and inter-library loan functions carried out on computer terminals. While the benefits of library automation are not directly transferable to an archival setting, the great strides achieved in library automation in the last decade have made a lasting impression on many archivists. As a result of this exposure, many archivists are now acutely aware that the computer is having, and will continue to have, a formative influence on their own work and responsibilities.

With the growing acceptance of archival automation as a viable alternative to more traditional archival administrative techniques, and with the realization that now, and in the future, archives will be required to maintain machine-readable records, the archival profession has moved from a stance of disinterest and doubt to one of growing anticipation. This in turn has led to increasing research activity and to the release of numerous publications pertaining to this emergent professional subfield. In 1979, the American Archivist devoted an entire issue to EDP archives and computer-based finding aids. In addition, SAA has released a series of separate publications on automation and EDP records, including an annotated bibliography, a basic manual, and a volume of symposium proceedings. Perhaps more dramatically than anywhere else, the SAA automation bibliography documents the nature and direction of research concerning computers, archival administration, and machine-readable records.

One must not lose sight of equally important
efforts conducted by archivists abroad. In 1972 the International Council on Archives (ICA) established a "working party on the implications of automatic data processing for archival management." This working party has served as an international forum for the discussion of archival applications involving automated records and techniques. The most significant contribution of this group to date has been the publication of a bilingual (French/English) journal, Automatic Data Processing in Archives, which serves as an information clearing-house for those involved in the field.

In America, the SAA Task Force on Automated Records and Techniques has served a vital educational and liaison function, bringing concerned archivists and the cybernetic age closer together. Major government and university archives, including the National Archives, the Library of Congress, Cornell University, and the University of Michigan, have undertaken major research, development, and educational efforts of their own. Among these projects, the development of SPINDEX by the National Archives in conjunction with a consortium of university and corporate users stands out as a major accomplishment.

As important as all of these accomplishments are, they only begin to address the educational needs of the professional as a whole. Workshops, seminars, and conference sessions sponsored by the SAA or by regional archival associations have in the recent past served to fill this void. However, many archivists return from these training sessions dissatisfied. The reasons for this unhappiness with the current level of professional educational activity regarding archival automation are two-fold.

First, most practicing archivists have received little or no training in computer technology, programming, or quantitative research. These archivists
face understandable difficulty in relating to the technical, administrative, intellectual, and even user-related needs of EDP archives and automated techniques. Second, those programs currently available to archivists for training purposes often address themselves to the needs of very large government agencies and research institutions. While imparting valuable information, these sessions fail to direct their attention to the pressing needs and concerns of small and medium-size archives.

If archivists as a profession are to progress from the second stage of education to the third and final stage of application, these problems must be dealt with. Archivists must approach this aspect of archival education more systematically. It is a propitious time, as part of our current re-evaluation of training practice and development of accreditation criteria, to introduce automated records and techniques into our course curriculums. This would ultimately mean a modicum of training in statistics, computer programming, and quantitative research combined with some practical, hands-on experience with computers for those entering the field of archival administration.

For archivists already working in the field, re-education is not such an easy alternative. Those employed by colleges or universities could conceivably take a few courses to supplement their formal training and experience in archives. This would not require any special programs; any comprehensive introductory course in statistics and computer science would, in all probability, suffice. Government and business archivists may not have access to university courses, but their agencies may provide training seminars for computer center personnel that might prove useful. In addition, a thorough tour of the parent institution's computer facility, combined with some experience in working with the equipment in the computer center, would help in at least
familiarizing archivists with EDP hardware, software, and records management problems. Finally, for the adventurous types, the home computer industry affords the opportunity for training and experience with computers within the comfort of one's own domicile.

Whatever specific strategy is chosen, archivists, especially those who are responsible for the education of the next generation, must develop the means to gain a fuller understanding of automated records and techniques. Conferences and workshops dealing with archival automation are only part of the answer. In the future, archivists will need a more substantial background in EDP records and techniques if they are to do their job properly. This in turn means that archivists must take a hard look at the manner in which new people are trained and adjust their methods accordingly.

EDP archives and computer-operated administrative systems are currently the province of large government and major university archives. The inhibiting factors for most small and medium-size archives in adopting automated systems are those of initial cost and personnel. Ultimately, all well-designed automated systems will save their users time and labor, and hence money, but the start-up costs for an automated program along these lines can be considerable. Both SPINDEX and the Smithsonian Institution's SELGEM programs, for example, require large computer hardware systems (main-frame computers) to operate. Unless an archives has access to such a system, operating costs for an automated system may prove prohibitive. If systems specialists, able to adapt the programming (software package) to an archives' requirements, are not readily available to the archives and willing to cooperate in the implementation of archival automated systems, the costs of bringing these services into the archives may also be too great.
Since government agencies and major universities and research centers usually have access to both adequate main-frame facilities and trained personnel, it is not surprising that they are leading the way in the development of archival and information management software. Even for these institutions, the maintenance of data archives has proven most difficult, since the highly specialized requirements for the preservation and servicing of EDP records requires expert and therefore costly professional supervision. The recognition of these problems has led to the emergence of a few machine-readable data archives such as the Inter-University Consortium for Political and Social Research and the Federal EDP archives, thus further reducing the likelihood of participation in the research and development process by smaller institutions and their staffs.

However, recent technological innovations and a number of high-level planning decisions within government suggest that the future for EDP archives and for the applications within more traditional archives is hopeful, indeed promising. Many archivists recognize that in spite of the growing importance of machine-readable records in our society, their long-term storage and use in research are undertakings that will always require substantial staff and financial resources. Few institutions can support such a project alone, and it now appears certain that the profession will move towards the establishment of cooperative centers for the management of archival machine-readable records.

The future is much less apparent in the area of EDP applications in archives. At least in the short term, SPINDEX and similar main-frame oriented software systems will continue to prosper. Indeed, projects currently underway by the Tennessee State Archives, Cornell University, and the Wisconsin Historical Society suggest that a number of agencies
have already chosen SPINDEX as their future information management system. This may, however, prove to be just a temporary phenomenon. SPINDEX, SELEGEM, and the rest are not particularly flexible in terms of either their hardware or software capabilities, nor are they inexpensive to obtain and maintain. While experimenting continues with system networking, and thus with the expansion of information retrieval beyond the walls of a single archives, the prospects for a national information system based upon something like SPINDEX appear remote.

Archivists drawing upon the experiences of colleagues in the library profession must begin the transition to automation with the development of small-scale, in-house systems that meet their own specific information needs. They should keep in mind the problems of "portability" and "networking potential", but their overriding concern ought to be accomplishing in-house tasks. The advent of the microcomputer has dramatically altered what archives can and hope to do in this regard. Like its larger and more expensive main-frame counterpart, the microcomputer has the ability to index, manipulate, and retrieve data, and unlike a main-frame system, it is relatively inexpensive to purchase and maintain. The microcomputer is rapidly becoming a common tool in business, government offices, and records management operations. While only a few archives, such as the Smithsonian Archives and the Archives of Appalachia, have actually considered microcomputer applications systematically, there is no question that the microcomputer will rapidly become a powerful tool in the management of archives and archival collections.

At present, the Archives of Appalachia at East Tennessee State University is at work on a grant supported by the National Endowment for the Humanities to study the feasibility of microcomputer applications in an archival setting. The pace of micro-
computer technological development has complicated matters, since each project discovery based upon the use of a six-month hardware configuration is being eclipsed by manufacturer breakthroughs. Thus, file structures predicated on the use of 5½-inch diskettes promptly become obsolete as the industry moves into more powerful operating systems employing 8-inch diskettes. These technological advancements have encouraged the project staff to rethink both their development methodology and their ultimate goals.

Even at this early stage, however, the research team at the Archives of Appalachia has discovered some useful information. For example, a microcomputer, when attached to a high quality printer, can serve as a powerful word processor, employed to generate camera-ready copy for archives publications and to handle a wide range of clerical, correspondence, and public relations functions. Secondly, the microcomputer can be programmed to handle the entry of accession and research records, supply inventories, personnel and payroll records, and even entire collection finding aids. The microcomputer also affords full text searching and can retrieve information down to the folder level. When attached to a printer, the microcomputer can print out hard copy versions of searches or finding aids at the discretion of the user.

The microcomputer is extremely affordable, and as technology improves and competition increases it will only become less expensive in the future. Since it employs high-level programming languages (i.e., languages that closely resemble English) such as BASIC and Pascal, archivists can learn to program microcomputers themselves. Many relatively inexpensive software packages, especially for word processing and accounting purposes, are also available. These systems can be loaded into the microcomputer in a matter of seconds. Most of the quality microcomputer systems on the market also have the capability to "interface" (i.e., connect) with other micros
and even main-frame systems over phone lines. Thus, microcomputers offer the archivist the opportunity to manage a wide range of automated systems in-house (including collection accession and description and user services) at a reasonable cost without recourse to an outside computer center. Such a system would also have the ability to connect with systems located in other archives.

Ideally, all archivists would like to see the development of a national information system that could search all of the archives in the United States to locate collections of interest to researchers. Some might argue that the creation of customized in-house microcomputer systems will work against this ultimate objective. However, as an information community, archivists are still in the first stages of defining the elements and structure of this national information system. While a number of proposals are under consideration, there is much to be done before there will be a functioning national network, which may be as many as five to ten years off. Meanwhile, archivists can enjoy the immediate benefits of automation within their own institutions, employing the technology currently available to enhance reference services, improve administrative operations, and free professional staff time from many tedious, clerical functions.

Perhaps most important, the application of automated procedures in archives, even at this early stage, will require archivists to reconsider their standing procedures, especially as these relate to the accessioning and description of their holdings. Standardization of procedures will be essential of archivists are to use the computer effectively and economically. While archivists have as a profession avoided periodic attempts to establish standard formats for their description of archival materials, they can no longer skirt the issue. A careful reexamination of in-house practices can achieve a level of
uniformity commensurate with the requirements of most automated systems. Indeed, the SAA's National Information Systems Task Forces cites this as one of its primary objectives. With a modicum of agreement on formats and information structures, archivists will find themselves in a position to proceed expeditiously with the development of a workable national information network. In the meantime, each self-examination of archival procedures can only lead to more efficient and effective in-house services in preparation for the cybernetic age that is sure to come.

Certain colleagues may view this scenario as overly optimistic. Some will, for example, question the assumption that greater efficiency and economy can be realized by archives through the introduction of automation. Admittedly, the economics of scale enjoyed by libraries through the introduction of OCLC and RLIN are not applicable to an archival setting. However, libraries large and small have automated many other aspects of their operations leading to greater efficiency, better record keeping, and statistics generation, and the shift of many routine duties from professionals to less expensive clerical and support staff. Similarly, archivists can turn to data base management systems and word processing software to handle such activities as accessioning, research registration, finding-aid generation, box and file folder label generation, budgets and grants administration, and routine correspondence and reports. Furthermore, the actual process of re-evaluation which must invariably precede the transition to automation will root out poorly designed and inefficient manual procedures and will encourage the development of a modicum of standardization where no order had existed previously.¹⁹

The issue of computerized finding aids rather than more traditional manually-produced guides is related to the question of the economical application
of automation to archives. Even the smallest of archives can benefit from the use of a microcomputer-based word processor as the project at the Archives of Appalachia has demonstrated. Indexes, calendars, card catalogs and the like are cumbersome, expensive to maintain, and out-of-date almost as soon as they are issued. For institution-wide, current information on holdings, an updateable, on-line data base of archival holdings descriptions is clearly superior both in terms of enhanced access and in terms of the cost of production and maintenance. Eventually, these institutional data bases will feed into a national automated resource which, thanks to the fine efforts of the National Information Systems Task Force, ought to contain standardized descriptive elements.

In the decade ahead the archival profession's response to automation will be a two-fold process. First, archivists will complete stage two of the model described at the beginning of this article by developing educational programs that will better prepare archivists to deal with both EDP records and EDP techniques within their own programs. Second, archivists will witness a systematic approach to automation within various levels of the profession. There will be, for example, a proliferation of regional data archives, many under federal control, for the permanent storage of EDP records. Archivists will also establish a descriptive standard from which will grow the framework for a national information system for the retrieval of archival materials. Finally, a cross section of the profession's membership will participate in the development of automated information retrieval and administrative systems. These trends will encourage a greater systematization and standardization in archival procedures and hence will facilitate the evolution of a national information network. If the present trends continue, the archival profession will most certainly experience a period of growth and technical sophistication in the decade ahead, a period in which the computer,
including the microcomputer, will play an important part.

NOTES

1 The author would like to acknowledge the assistance of Don Hurst, Head of Systems, University of Colorado at Boulder, in developing Microcomputer Archival and Records Management Systems (MARS) for the Archives of Appalachia and the generous support of the Research Division of the National Endowment for the Humanities and East Tennessee State University in providing both the means and the released time to pursue this research project.


3 See, for example, M.E. Carroll, "Public Archives of Canada Survey of EDP Installations,"


7 Richard M. Kesner, Automation, Machine-Readable...

8Kesner, 4-10.

9Meyer H. Fishbein of the National Archives and Records Service served (and still serves) as the U.S. representative on that body. For the policies and objectives of the ICA working party, see ADPA 1 (1972): 1-15 (minutes) and Appendix I (resolutions).

10ADPA is published irregularly as issues become ready for press. U.S. archivists may obtain subscriptions through Meyer H. Fishbein, Director, Military Archives Division, National Archives and Records Service, Washington, D.C. 20408.

11The Committee on Automated Records and Techniques began its work in 1977 through the development of a five-year education program. Many of the recent SAA publications in the field of archival automation stem from the efforts of the committee, now renamed as an SAA Task Force.


13H. Thomas Hickerson, ed., SPINDEX Users' Conference: Proceedings of A Meeting Held at Cornell
The users of SPINDEX have formed their own organization, the SPINDEX Users Network (SUN) and are publishing a newsletter available to non-users for $10.00 a year.


15See A. L. Bain, "Computer Applications to Archives and Manuscripts at the Smithsonian Institution Archives," ADPA 2/3 (1978): 13-21, for a thorough discussion of SELGEM. For a survey of SPINDEX see Hickerson et. al., SPINDEX II.

16A serviceable system including computer memory, printer, two disk drives, a television monitor, and a few software packages costs as little as $3,200.
