

Final Report

Automated Records and Techniques Curriculum Development Project

COMMITTEE ON AUTOMATED RECORDS AND TECHNIQUES

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This is the final report of the Automated Records and Techniques Curriculum Development Project, which was sponsored by the Committee on Automated Records and Techniques (CART) of the Society of American Archivists and funded by the National Historical Publications and Records Commission. Jane Kenamore, education officer and senior archivist of the Society of American Archivists, was the project director. Victoria Irons Walch, consulting archivist, was the project coordinator. A full list of conference participants is in Appendix I on page 497.

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INTRODUCTION

- *A state archivist has just learned that the Division of Vital Statistics is planning to implement an optical-disk imaging system. The information contained in birth, death, and marriage certificates is clearly of permanent value, but how long will it remain usable in that form? Are there standards that the systems designers can use to ensure that these records can be accessed through the next generation of hardware and software? How does the state archivist get the program managers and systems designer to listen to archival concerns?*
- *A corporation with many remote facilities relies heavily on a complex telecommunications network to conduct its business. Most key decisions are formulated and executed over the network, which carries voice, text, graphic, and video data. How do information resource managers identify and protect the vital documents residing on the network? How can archivists ensure that these documents will remain accessible for future reference and research? How do these and other information professionals coordinate their work? What roles should they play in the actual design of the network and in the creation of "documents" and "document standards"?*
- *A university computing center is accumulating a large backlog of data files from the various bulletin boards and discussion lists operated by its faculty and staff. The center "archives" all messages indefinitely so that users can search for previous postings on specific topics. How long should these files be retained by the computing center? Should some, all, or none of the records become part of the university's permanent records? Do interuniversity communications warrant more*

scrutiny than intracampus mail?

- *A county historical society has just received a desktop computer system as a charitable donation. The manuscript curator has depended for years on a makeshift card catalog for access to the collections and has never used a computer before. What software is available to make the curator's job easier? How can the curator evaluate the available options? Where can the curator get information about what other repositories are doing with automation?*

If you are working as an archivist in the United States in 1993, it is likely that you have already confronted an automation-related dilemma similar to one of those described above. If not, you will soon.

It is safe to say that most archivists in the United States no longer need to be persuaded that automation is having a profound impact on their work and will continue to do so. Each day archivists encounter new ways in which computers and other new technologies are affecting the ways we perform our professional tasks, the nature of the records we are charged with preserving, and the roles we play in the organizations we serve. Much like our sister professionals in the library field, our questions regarding automation have changed from "Will we?" or "Should we?" or "Can we?" to "When?" and "How?" and "How much?" and "How soon?"¹

We have reached a point in the evolution of technology when every type of record we can think of has been or soon will be digitized sometime during its life cycle. Some records exist only in digitized form. If we are to continue to accomplish our

¹Sara F. Fine, "Technological Innovation, Diffusion and Resistance: An Historical Perspective," *Journal of Library Administration* 7 (Spring 1986): 84.

mission—to ensure the identification, preservation, and use of records of enduring value²—then we must grapple with records that are generated and used in a variety of technological contexts. We must also harness the considerable power of technology to perform our professional tasks in storing and accessing records in all forms, new and old.

THE NEED FOR AUTOMATION-RELATED EDUCATION

As early as 1971, members of the Society of American Archivists (SAA) saw education as one of the key strategies for helping archivists understand the functions of computers and their application in an archival context. Activity was focused in the work of SAA's Committee on Automated Records and Techniques (CART) and the task force that preceded it, which has always considered education a top priority. The first workshop on machine-readable records was offered at the 1978 SAA annual meeting. By the early 1980s, the Task Force on Automated Records and Techniques had developed its first comprehensive curriculum. By 1989, more than thirty one- and two-day workshops and seminars had reached some seven hundred participants. Thomas Brown's background paper in this issue provides an enlightening overview of the development of the curriculum during this period.

Other archival organizations, both in the United States and internationally, also responded during the 1970s and 1980s. Within the International Council on Archives (ICA), discussions began in 1972 about what kinds of training archivists need in automation-related areas. In 1981–82, the ICA Committee on Automation decided to sponsor

development of a model curriculum. The results were published in 1985.³

The National Association of Government Archives and Records Administrators (NAGARA) has held advanced institutes each summer since 1989 to deliver “intensive instruction on the characteristics of and projected future changes in modern information systems and to be introduced to management tools needed for operating in this new environment.”⁴ Attended principally by state archivists or senior state archives staff members, the institutes have provided a unique opportunity for cooperative learning and shared experiences. The positive impact of their emphasis on strategic planning techniques has been felt in all components of state archival programs.

Individuals working with social science data files have benefited from educational offerings at the Interuniversity Consortium for Political and Social Research (ICPSR) and at the annual meetings of the International Association for Social Science Information Service and Technology (IASSIST).

The Association of Canadian Archivists (ACA) included a section, “Automation and Archives,” in its guidelines for a two-year master's degree in archival studies.⁵ In 1992, the ACA also established a special interest section on electronic records which has been studying training issues.

The United Nations began a broad-scale effort concerning the management of electronic records in the mid-1980s. In addition to two major reports on electronic records

³M. H. Fishbein, *A Model Curriculum for the Education and Training of Archivists in Automation: A RAMP Study* (Paris: UNESCO, 1985).

⁴*Archival Administration in the Electronic Information Age: An Advanced Institute for Government Archivists* (Pittsburgh: School of Library and Information Science, University of Pittsburgh, 1991), 1.

⁵Association of Canadian Archivists, Education Committee, *Guidelines for the Development of a Two-Year Curriculum for a Master of Archival Studies Programme* (Ottawa: ACA, 1992).

²Society of American Archivists, *Planning for the Archival Profession: A Report of the SAA Task Force on Goals and Priorities* (Chicago: Society of American Archivists, 1986), vi.

management, the Advisory Committee for the Coordination of Information Systems (ACCIS) issued curriculum materials to train U.N. staff worldwide.⁶

By the late 1980s, CART's members became concerned about the educational program available to archivists in automation. Until that point, most such education occurred in the context of workshops and seminars at annual meetings. Despite the existence of formal curriculum documents, CART had never been able to implement them fully. Each annual meeting program committee made its own decisions about what to offer, consulting only infrequently with CART about its larger educational goals. Furthermore, the individual CART members who had been carrying the teaching load for a decade or more were exhausted. CART had developed a valuable resource over the years in the form of an extensive body of curriculum materials—syllabi, reading lists, illustrations, and exercises—and hoped that these materials could be made available, in an organized way, to a broader group of potential instructors.

To address these concerns, CART members prepared an ambitious grant proposal which was submitted to the National Historical Publications and Records Commission (NHPRC) in October 1989. It called, first, for a curriculum conference to develop learning objectives in the areas of electronic records and automated techniques and, second, for the preparation of three teaching packets: basic computer concepts, the archival management of elec-

tronic records, and the use of automation in archival repositories.

When the commission met in February 1990, it agreed to fund the first portion of the project, the curriculum conference to develop learning objectives. Presumably, once that group had decided what to teach and how best to teach it, then NHPRC would be in a better position to consider whether the proposed teaching packets were truly a wise investment.⁷

THE WORK OF THE CART CURRICULUM PROJECT

Since it began in the fall of 1990, the project has examined in depth not only what archivists need to know to cope adequately with the changes brought about by new technologies but also how best to help them learn it. The project builds on earlier work in several ways. Most clearly recognizable is the connection between the contents of the earlier CART and ICA curriculum documents and the newly developed learning objectives (discussed later in this report). The project participants were concerned not only with the content of the curriculum but also with its delivery. It was crucial that subject specialists and education specialists collaborate to ensure that the *contexts* for learning were as appropriate as the *contents*.

To prepare participants for the project's first conference held in March 1991, three archivists who had been active in CART and its educational programs for many years—Thomas E. Brown, Margaret Hedstrom, and Richard M. Kesner—pre-

⁶Advisory Committee for the Co-ordination of Information Systems (ACCIS), *Management of Electronic Records: Curriculum Materials* (New York: United Nations, 1992). See also ACCIS, *Management of Electronic Records: Issues and Guidelines* (New York: United Nations, 1990) and *Strategic Issues for Electronic Records Management: Towards Open Systems Interconnection* (New York: United Nations, 1992).

⁷At the same meeting, the NHPRC approved publication of a staff report, *Electronic Records Issues: A Report to the Commission*, which recommended that five types of activities receive special consideration for financial support. The third type was "Educational activities such as workshops, courses, curriculum development, and training for strengthening archival capabilities for dealing with issues relating to electronic records systems."

pared background papers. They traced the development of SAA's involvement in automation education and presented needs assessments in the areas of electronic records, automated applications, and information technology. Two archival educators, Terry Eastwood and Richard Cox, were also invited to prepare papers—Eastwood on how automation issues could be integrated into the overall archival curriculum and Cox on the roles of graduate and continuing education programs in dealing with automation issues. All five of these papers are published in this issue of the *American Archivist*.

Both before and after this conference, the participants and project staff examined the experiences of other professions and drew on outside expertise. They read widely on such topics as the socialization of professionals, the development of continuing education programs, the psychology of education generally and of adult learners in particular, organizational change, and the diffusion of innovation. They examined the varying roles graduate schools and professional associations play in providing educational opportunities within other professions. The library literature was especially fruitful because librarians have been coping with automation in institutional and professional settings very similar to our own. We profited greatly from the insights offered in the many thoughtful articles published by archivists over the last several years as well as those prepared specifically for this project.

First Conference: March 1991

Nineteen individuals participated in the March 1991 curriculum conference.⁸ There were strong representatives from both CART (the automation experts) and SAA's Com-

mittee on Education and Professional Development (the education experts). This was the first time these two groups had ever come together in any formal way to address problems of mutual concern.

The two days of discussion ranged over a variety of interrelated issues. Definitive conclusions were difficult to reach, in large part because both the automation specialists and the education specialists came to the meeting at a time of substantial change within their own circles. The broad concerns and questions addressed during these discussions were issues relating to the contents of the curriculum, the optimum contexts in which to deliver education, and the resources necessary for successful educational programs.

The following sections summarize the discussions that occurred during the conference itself and include additional insights gained from an examination of external literature following the conference.

Content of the curriculum. While it was relatively easy to look back on the CART curriculum documents from the early 1980s and say they needed updating, it was more difficult to say with confidence what a new curriculum should include. The uncertainty is a result both of disagreement among automation specialists about where we are now and where we should be going and of challenges presented by the rapid pace of technological change.

The uncertainty was especially acute in the area of electronic records. Margaret Hedstrom has characterized their current state of development as "electronic incunabula," comparing them metaphorically to the earliest printed books, those produced before 1500;⁹ of course fifteenth-century

⁸For a list of the conference participants, see Appendix I of this report.

⁹Margaret Hedstrom, "Understanding Electronic Incunabula: A Framework for Research on Electronic Records," *American Archivist* 54 (Summer 1991): 334–54.

printers had no way of predicting the enormous societal impact their new products would have. The effects of computers on social institutions, communication systems, and work methods are now matters of intense debate.

Questions specific to archival practice are even harder to answer definitively, and consensus is probably years, if not decades, away. Terry Cook has noted in a recent review essay that a "second generation" of electronic records archivists is now in ascendancy.¹⁰ But the members of this second generation do not all agree on how to approach electronic records management.

One aspect of the discussion involves whether records in electronic form are simply the same stuff in a different media, subject to all the traditional archival principles that have been taught for years, or whether electronic information is making such profound changes in society that it will force archivists to abandon their traditional roles of acquisition and custodianship.¹¹ It is possible that archivists responsible for the preservation and long-term use of information in advanced electronic information systems will never take physical custody of anything. Archival principles will have to be reshaped significantly to emphasize intellectual management in the absence of physical management.

The rapid pace of technological development further complicates the discussion. Not only is it difficult to understand fully all of the technologies currently on the market, it is impossible to predict with cer-

tainty what capabilities will be available in the future. Many current concerns about data exchange may be alleviated as more hardware and software vendors adopt standards or other vehicles to enable disparate systems to communicate. On the other hand, threats to individual privacy may prompt overhauls in public policy that could effectively shut down future access to entire bodies of records.

The curricular considerations relating to the application of automated techniques are somewhat less complicated, simply because agreement is broader. Bibliographic cataloging systems using the USMARC AMC format were accepted rapidly after their introduction in the early 1980s and are now in widespread use. Donald L. DeWitt has noted a dramatic increase in the number of employers requiring AMC experience in job announcements from 1980 to 1989. He also found some evidence that educational programs were responding to the demand by increasing their AMC training opportunities, although the amount of education available has not kept pace with the evident demand for these technical skills from employers.¹²

More broadly, "the ability to use a computer is considered a basic skill almost in the same category as the ability to use a telephone or a typewriter."¹³ Word processing and spreadsheet applications are now used by most office workers, not just secretaries and accountants. Understanding how databases operate is crucial not only for navigating sophisticated cataloging sys-

¹⁰Terry Cook, "Easy to Byte, Harder to Chew: The Second Generation of Electronic Records Archives," *Archivaria* 33 (Winter 1991-92): 202-16.

¹¹See David Bearman, "An Indefensible Bastion: Archives as a Repository in the Electronic Age," in *Archival Management of Electronic Records*, edited by David Bearman (Pittsburgh: Archives and Museum Informatics, 1991), 14-24. This article is followed in the same volume by commentary by Margaret Hedstrom, "Archives: To Be or Not To Be," 25-30.

¹²Donald L. DeWitt, "The Impact of the MARC AMC Format on Archival Education and Employment During the 1980s," *Midwestern Archivist* 16, no. 2 (1991): 84. Another perspective is presented in Connie Schultz, "Analysis of the Marketplace for Educated Archivists: State Archives as a Case Study," *American Archivist* 51 (Summer 1988): 320-25.

¹³Barbara M. Preschel, "Education of the Information Professional: What Employers Want," *Journal of the American Society for Information Science* 39 (September 1988): 359.

tems but also for more mundane tasks, such as producing newsletter mailing lists and prospective donor contact files. In addition, even if the archivist is not a spreadsheet user, the individuals or organizations creating records that will be offered to the archives probably are using them. To manage future collections effectively, the archivist must understand the modern office environment.

In addition to basic computer literacy and knowledge of office systems, the conference participants knew that the learning objectives would have to emphasize the importance of higher-level management and communication skills. Some, such as knowing how to develop information policies or supervise information resources in organizations, are particularly valuable to archivists as information professionals. Others, like strategic planning and communication, are important to managers in any context.

Margaret Hedstrom made one comment that resonated through the March 1991 curriculum conference: "We can only teach what we know." Most participants seemed to agree that, despite our speculations about what might lie ahead, we have learned a lot in the twenty years since archivists first started planning workshops on automation. Hedstrom later observed that "our real challenge is to strike a balance between teaching known methods and techniques—built around traditional archival functions—and preparing archivists for the unknown challenge that lies ahead."

The participants acknowledged a number of characteristics that are important for professional success, especially in a technical and rapidly changing area, but that cannot easily be taught. These include interpersonal skills, communication, adaptability, problem solving, and decision making. Michael Eraut has discussed the problems in trying to instill these characteristics, noting that "what comes easily to

some may need 'spelling out' for others."¹⁴

In dealing with automation, adaptability and problem solving are especially acute needs because of the constant change and continuous search for answers to new problems. Participants speculated that graduate schools may make the greatest contribution by teaching future practitioners *how* to learn and by teaching fundamental archival concepts in such a way that students can apply them to a changing society and workplace. Specific subject matter studied may ultimately be less important than the attitudes and learning skills acquired. "One individual may choose to major in art, another in education, but the way in which he or she learns to learn is more important than the actual subject matter. Differences in knowledge can be overcome if the person knows how to learn and enjoys the process."¹⁵

A positive attitude and personal commitment are essential to archivists working in these areas. "A good employee is always engaged in a process of self-education, learning about new developments in the field or in job-related fields but also pursuing knowledge for his or her own amusement and amazement, keeping the spirit fed."¹⁶

Even if we cannot codify these traits in formal learning objectives, we can encourage their development in the way archivists are taught. Participants in the first conference pointed to case studies as an obvious choice to encourage problem solving and decision making. (This was explored in even greater depth during the second conference, which is discussed later in this re-

¹⁴Michael Eraut, "Knowledge Creation and Knowledge Use in Professional Contexts," *Studies in Higher Education* 10, no. 2 (1985): 119.

¹⁵Preschel, "Education of the Information Professional," 359.

¹⁶Preschel, "Education of the Information Professional," 360.

port.) They also suggested that internships or mentored projects (in which an outside expert comes into an institution on a consultative basis) can foster interpersonal and communication skills by providing active role models to emulate.

Finally, the participants considered the appropriate level of integration of automation-related subject matter into the overall archival curriculum. Consensus emerged early that most good electronic records archivists were good archivists to begin with or, in other words, that a solid grounding in basic archival principles and techniques was essential for dealing with records in any media. As the learning objectives were laid out, it immediately became clear that there were innumerable interconnections between what archivists need to know to be effective archivists generally and the specific knowledge and skills they need to deal with automation.

Contexts for learning. This project came at a time of intense discussion among archivists in the United States about when and how archivists should be educated, not just about automation-related topics but about archival practice in general.

One of the principal points of contention is the appropriate roles for pre- and postappointment training, with vocal advocates on both sides. More important, each serves very different clienteles. While most archivists in the United States agree that the longstanding reliance on short-term workshops and institutes as a primary archival training vehicle is simply not adequate, others are skeptical that a preappointment graduate degree requirement is a realistic or workable solution.

The SAA Committee on Education and Professional Development (CEPD), several of whose members participated in the first conference for this project, have developed guidelines for a two-year master's degree program which have been submitted to the SAA membership for review and ap-

proval.¹⁷ Even if such guidelines are accepted, archivists still face the dilemma of deciding where such a program fits in the broader academic landscape. Most archival graduate programs have been housed in library schools, history departments, or a combination of the two, taking the form of a dual-masters program. The significant number of library school closings in the last decade, however, makes many hesitant to tie archival fortunes to institutions that have unclear futures. History departments are not necessarily closing, but neither are they exactly vigorous. Standing alone, they would be challenged to offer training in the increasingly technical requirements of modern archival practice.

Interestingly, Paul Conway's analysis of the 1989 SAA salary survey indicates that much of the specialized archival graduate work pursued by the respondents occurred *after* their employment by an archival institution. He suggests that rather than using acquisition of an archival master's degree to "control entry to the profession," it might be more profitable to encourage development of graduate programs that can be pursued by working practitioners.¹⁸ This approach would certainly be advantageous for automation-related education, in which practitioners will require regular updates throughout their careers as new technologies appear.

The participants expected that all students emerging from graduate archival programs would, at a minimum, have been exposed to the content outlined in what is now the Foundation Cluster of the learning objectives, which are discussed later in this article. The goal should be broad understanding of the impact of technology on

¹⁷The guidelines were published as an insert in *Archival Outlook* (May 1993), following p. 16.

¹⁸Paul Conway, "G.A.P. Track: Membership Survey Results," *SAA Newsletter* (January 1992): 3, 9.

records and recordkeeping practices and archival adaptations to the resulting changes. Definitive solutions or techniques will be difficult to teach in the face of rapid change.

Another important role for graduate schools is to encourage research in technological applications and concepts. Research projects undertaken by working archivists in repositories usually are very specific in focus, may not always translate well to another institutional setting, and often are not written up or disseminated because of competing demands on staff time and energy.

Frank Burke and Richard Cox have frequently cited graduate students, a cadre of willing researchers, as an argument for encouraging the growth of graduate programs. As a profession, we could benefit from more independent, academically based research, the kind that results in master's theses and doctoral dissertations. Healthy graduate programs, wherever they may be based, can foster new insights and analysis. If stronger and more deliberate attempts were made to encourage continuing education in these same departments, the synergy among new entrants and experienced practitioners could benefit all.

At present, most postappointment training is made available through continuing education programs within professional associations. SAA, the primary archival educator outside of graduate schools, is also struggling—through its Education Office Advisory Board, CEPD, and the Archival Educators' Roundtable, among others—to define its role in the larger context of archival education. Should it continue to be a primary provider of direct education? Or should it play more of a coordinating role, providing overall guidance, cooperating with allied organizations, and setting standards?

Cyril Houle asserts that "a manifest function of every professional association is the continuing education of its membership; indeed, scarcely any other function

has a longer tradition than this one."¹⁹ His definition of continuing education goes far beyond workshops and reinforces the broader view taken by the project's participants. He identifies three areas through which professional associations deliver educational opportunities to their members:

1. Planning and coordinating

- Development of standards and guidelines which present criteria for the content of educational programs
- Cooperation with other societies, universities, and employers
- Surveys of member needs, interests, and attitudes

2. Implementing specific programs

- Guidelines for sections or local chapters
- Speakers bureau
- Short course offerings
- Instructional materials

3. Information dissemination

- Journals and newsletters
- Technical publications
- Nontechnical publications
- Annual meetings

SAA would be well advised to evaluate its approach to continuing education in all areas from this broader perspective. Margaret Hedstrom has already suggested that SAA should give greater emphasis to its planning and coordinating roles.²⁰ Certainly SAA should continue to offer some specially targeted workshops, particularly when that is the best way to reach specific audiences with a individual message or set of skills.

¹⁹Cyril O. Houle, speech at American Library Association 1967 Midwinter meeting in New Orleans, as quoted in Elizabeth W. Stone, *Continuing Library Education as Viewed in Relation to Other Continuing Professional Education Movements* (Washington, D.C.: American Society for Information Science, 1974), 72.

²⁰Margaret Hedstrom, "The CART Curriculum Development Project: New Roles for Professional Associations," unpublished paper delivered at MARAC, May 1992.

More important, however, will be using SAA's collective intellectual power to identify needs and coordinate effective educational offerings with other professional associations, graduate schools, and employers. The Society should also keep these guidelines in mind when planning improvements in its publications programs and should consider the use of communication technologies to deliver educational programs in novel ways.

Clearly, many of these activities can also be undertaken by regional archival associations and many already have been. The Midwest Archives Conference, the New England Archivists, the Society of Georgia Archivists, the Society of California Archivists, and the Mid-Atlantic Regional Archives Conference are only a few with active publications or educational programs. Obviously NAGARA and the Academy of Certified Archivists should consider their responsibilities in this light as well.

Resources necessary for successful education. A third area of discussion among conference participants was the support that archivists will require, especially from their employers, to obtain necessary education and skills training. Even if automation were fully integrated into the graduate curriculum today, the current generation of practicing archivists would need a range of new skills to deal with automation. Because more change is anticipated, the availability of ongoing education is critical, even for those who are familiar with automation issues.

Managers of archival programs have a responsibility for providing support to their employees who need further education to help them adapt to innovation. In turn, employers will reap the benefits of higher productivity and morale in a staff that is adequately prepared and confident in the face of change.

Without a planned program of training and development, chaos tends

to result as change is continually introduced. This in turn can lead to inadequate services, poor staff morale and high turnover, and eventually a diminished view of the library by faculty, students and administrators. . . . Substantial resources should therefore be allocated to provide numerous opportunities for learning and development—even during tight budget times.²¹

In the broadest context, this means establishing an institutional climate that encourages and supports individual education and group progress. Houle cites three essential components:

- Building in educative features, including a good library, colloquia, lectures by outside experts, demonstrations, release time, and tuition reimbursement for formal course work as well as conference and convention attendance.
- Systematic use of team approach, in which various specialists from different professions work together on selected cases that "offer an opportunity for interactive instruction."
- An atmosphere of all-encompassing mutual growth and stimulation.²²

No matter how many formal educational opportunities are available, however, much of what archivists learn will come in the workplace, either through formal on-the-job training or through informal, hands-on experience and communications with colleagues.

At the broadest level, much of what the learning objectives are dealing with is

²¹Sheila D. Creth, "University Research Libraries," in *Education for Professional Librarians*, edited by Herbert S. White (White Plains, N.Y.: Knowledge Industry Publications, 1986), 19.

²²Houle, *Continuing Learning in the Professions*, 115-17.

change. There is wide variation in the ways specific institutions and their managers introduce change and help their staffs cope. They must be aware of strategies that do not work and strive to avoid them.

Sara Fine describes situations in which change was introduced in the worst possible ways, through the "use of destructive, coercive strategies where units were reorganized and roles and functions summarily changed without consultation, without explanation, and without preparation. Perhaps most demoralizing were 'take it or leave it' strategies. This kind of approach perhaps reflected concern for short-term profit, but the price was the erosion of employee loyalty and commitment to the organization. Coercion was met by hostility; manipulation begat counter-manipulation."²³

Positive support—intellectual, financial, and social—can be provided to archival employees in several ways:

- Continued attention to on-the-job training
- Release time to attend conferences, pursue independent research, participate in professional organization committees, as well as register for formal workshops and seminars
- Tuition reimbursement for workshops or university-based education
- Encouragement to participate in cooperative projects with other institutions faced with similar problems
- Informal in-house seminars or lectures, led either by staff members or outside experts

Employers should also recognize how much an individual learns when called on to teach others. Conducting a seminar, presenting a paper, or writing an article hones an employee's skills. Release time for such activities is an investment, increasing the organization's productivity and providing a

service to the profession simultaneously.

Peggy Johnson cites three factors as critical to facilitating technological change: collaboration/participation, communication, and leadership.²⁴ Archival institutions that will successfully meet technical challenges must encourage all three.

Outcomes of the first conference. The principal product of the first conference was to be a detailed set of learning objectives. Following presentations by the authors of the five background papers and an extensive discussion about how to tackle the job, the participants decided to use an outline presented in Margaret Hedstrom's paper as a basis for detailing specific curriculum content needs. The document that resulted had four broad sections: basic computer concepts, electronic records, automated techniques, and archival concerns in the modern information environment. The conference participants met in four smaller groups to flesh out each section. Following the conference, these group outlines were further edited and merged into a single document by the project coordinator.

This draft document was distributed to the participants in the original March conference and was discussed at the April 1991 midyear meeting of CART. It was also distributed at several task force and committee meetings during the 1991 SAA annual meeting and to others on request. Several of the conference participants responded with long and thoughtful letters suggesting everything from minor revisions to major overhauls.

It was clear that this version was a transitional document. It contained a lot of detailed information about what archivists could and should be taught, but several participants expressed concern over whether it

²³Fine, "Technological Innovation, Diffusion and Resistance," 91.

²⁴Peggy Johnson, *Automation and Organizational Change in Libraries* (Boston: G. K. Hall, 1991), 95–98.

truly represented "learning objectives." Margaret Hedstrom, for one, suggested that the document was really "more like a course outline or syllabus than learning objectives."²⁵ Hedstrom expressed hope that the final learning objectives would be much broader statements, with the detailed enumeration of skills and facts relegated to a supporting or explanatory role.

Second Conference: November 1991

The original conference participants agreed that the document could best be refined by a much smaller group. SAA therefore sought and obtained additional NHPRC support to convene a second and smaller conference with just six participants (plus project staff); the conference was held at the SAA office in Chicago on 1–2 November 1991. The participants were Margaret Hedstrom, Richard Kesner, James O'Toole, Leon Stout, Kenneth Thibodeau, and William Wallach, with project and SAA staff Victoria Irons Walch, Jane Kenamore, and Anne P. Diffendal.

The second conference group reorganized the original document into four "clusters," adopting the term from O'Toole's article which had appeared earlier that year (but after the first conference was held).²⁶ Within each cluster are several broad learning objectives, each of which is accompanied by specific content statements. Their draft of the learning objectives was reviewed and further refined by CART at its fall 1992 meeting in Montreal. The final version, which appears in this report under the heading "Learning Objectives," reflects CART's additions.

The participants in the second conference returned to the discussion about the

importance of having a thorough grounding in basic archival principles and methods. As a result, they recast portions of the first and last sections of the original learning objectives document into a new "Foundations Cluster." The learning objectives in this cluster are designed to provide a bridge between traditional archival principles and methods and those needed to work in an automated environment. At this point, they decided to recommend that SAA and CART adopt as a goal that, by the year 2000, every archivist in the United States be exposed to the contents of the Foundations Cluster.

The participants in the second conference made few changes in the second and third clusters except for adding the broader statements as indicated above. These clusters were more substantially revised by CART in Montreal.

The fourth major section in the document is now designated the "Management Cluster." It contains pieces from the original learning objectives and several new areas proposed by Richard Kesner and others. The inclusion of a separate cluster of learning objectives specific to management reflects the changing relationships among archivists, organizations, and the information systems they create. Archivists need to move more quickly, even intervening at the creation of record systems, to ensure the preservation of documentation. They need communication skills to convince program managers and system designers to heed archival concerns. They must operate strategically to use limited resources most effectively for the benefit of the organizations they serve as well as future users of records. Finally, they often find themselves managing technical specialists whose work is crucial to the archival enterprise but beyond the manager's own experience.

After reworking the learning objectives, the participants in the second conference, like the first, spent a significant amount of time discussing how best to deliver all the

²⁵Letter, Hedstrom to Walch, 1 May 1992.

²⁶James M. O'Toole, "Curriculum Development in Archival Education: A Proposal," *American Archivist* 53 (Summer 1990): 460–66.

information and skills they identified to archivists, from novice professionals to experienced practitioners. Although they touched on everything from workshops to videotape presentations, several topics received special attention, and they are discussed in detail in the following sections of this report.

Institute for graduate archival educators. Graduate archival educators bear significant responsibility for teaching entering professionals but are not always well equipped to prepare their students for the challenges presented by automation. Rapid advances in the last decade may mean that graduate archival educators are at a lower level of computer literacy than their students. If the educators received their own academic training in the humanities before the period between 1975 and 1980, they probably had little or no exposure to automation in their coursework. Use of computers in the archival workplace was fairly limited until the mid-1980s, so even educators who have been teaching for only a few years probably have little direct experience in an automated work environment. Without some positive intervention, full-time educators risk being further cut off from rapidly evolving practice.

Participants agreed that graduate educators need (1) a foundation of knowledge about automation and its effects on record-keeping, (2) exposure to sources they can use to monitor evolving technologies in order to remain current, and (3) curriculum materials on archival automation that they can adapt for use in their own classrooms. Ideally, educators need to be equipped to integrate automation into all parts of the archival curriculum.

One way to address these concerns would be to conduct an institute for graduate archival educators modeled in part on the NAGARA Advanced Institute in Archival Administration held at the University of

Pittsburgh.²⁷ The graduate educators' institute might be held in two-week sessions in two successive years. The two-year approach capitalizes on one of the most positive characteristics of the Pittsburgh institute, allowing participants to take what they have learned during the first session, apply it in their home institutions for a year, then reconvene to discuss their various successes and failures, learning from one another's experiences.

The conference participants' tentative discussions about the structure of the institute projected between twenty and twenty-five attendees. They would be led by guest lecturers who are specialists in electronic records and the use of automation for managing archival collections and repositories. The first week probably would focus on conveying basic facts and concepts, essentially the components of the Foundation Cluster in the CART Learning Objectives. The second week would be devoted to more advanced discussions (selected topics covered in the other three clusters) as well as to the presentation of specific curricular materials that the educators could use with their students. Some of the materials might be compiled in advance by individuals with experience teaching these topics, whereas others might be developed by the participants themselves (as the "instructional experts") under the guidance of one or more of the guest lecturers (the "subject experts"). Special emphasis might be given to developing case studies, which were seen as an especially effective but thus far underused means of dealing with rapidly evolving technologies and their effect on

²⁷A summary of the 1991 institute is available in *Archival Administration in the Electronic Information Age: An Advanced Institute for Government Archivists* (Pittsburgh: School of Library and Information Science, University of Pittsburgh, 1991). There are also summaries for the 1989 and 1990 institutes.

archival practice. (See further discussion on the case method below.)

A major university is already considering hosting this institute, providing the skilled archival faculty members and technologically advanced training facilities that will be essential for its success. The organizers will have to draw on the expertise of a broad cross-section of the archival profession to prepare the curriculum, develop case studies and other teaching tools, and serve as guest faculty. To their credit, they are already working closely with representatives of SAA to ensure full cooperation between the academic community and the association.

Use of the case method in archival education. In a period of rapid change, there are rarely any "right" or "wrong" answers, only opinions. Novices might be looking for prescriptions for the one true course in administering an archival electronic records program. Those with more experience in this area argue about whether it will continue to be practical to transfer these files to archival custody, how best to plan for migration to new technologies, and when in the life cycle of a records system archivists should assert their interests. Rapid technological change calls not only for constant readjustment in techniques but also for the development of concepts of what is possible or practical.

Case studies provide an ideal mechanism for teaching archivists the problem-solving skills they need to cope with these and other questions in the absence of hard and fast rules. This project is not the first to advocate their use in archival education. Francis Blouin wrote in 1978 that "the method encourages systematic reasoning and analysis by students in working through specific case situations or in evaluating specific decisions reported. . . . [They] witness not only what the archivist does, but, more important, how the archivist thinks about what he or she does and for what reasons." He

goes on to note that the development of a body of case materials would have an added benefit in encouraging systematic reporting about unusual or innovative approaches to specific problems, allowing a "brief, simple, and efficient way for institutions to communicate . . . not just what is being done, but for what reasons decisions are reached."²⁸

Conference participants suggested a number of approaches to accumulating case materials. One logical place to start is a review of the already extensive body of cases available from Harvard University and others in the fields of business and law to determine if any could be used as originally written or could be adapted for archival training needs. It might also be possible to convene "case discussion groups," panels of archivists with substantial experience in the field (and therefore lots of war stories). One group could address electronic records and the implementation of automated systems in archives.²⁹

The case method appears so promising that it is already being pursued in at least two ways. Richard Kesner and James O'Toole will present a workshop on the technique at the 1993 SAA annual meeting in New Orleans. Kesner also drafted a grant proposal on behalf of CART for a project to develop and publish cases on topics related to automated records and techniques. The proposal is being considered by the National Historical Publications and Records Commission.

(For additional discussion of this approach, particularly the goals of the work-

²⁸See Francis X. Blouin, Jr., "The Relevance of the Case Method to Archival Education and Training," *American Archivist* 41 (January 1978): 37-44.

²⁹For a brief description of how such "case discussion groups" operate, see Abby J. Hansen, "Reflections of a Casewriter: Writing Teaching Cases," in *Teaching and the Case Method*, edited by C. Roland Christensen (Boston: Harvard Business School, 1987), 264-70.

shop, see Richard Kesner's article "Employing the Case Study Method in the Teaching of Automated Records and Techniques to Archivists," in this issue.)

Information availability and dissemination. The problem of "keeping current" received attention during both conferences, but especially during the second. How can archivists keep themselves informed about evolving issues? The case for an effective clearinghouse has been repeated often over the years from many quarters, but little apparent progress has been made.

Following a recommendation from a NAGARA-sponsored study on information resources for archivists and records administrators, the National Archives and Records Administration (NARA) established in the mid-1980s the Archives Library Information Center (ALIC). Since then, ALIC has produced excellent quarterly news briefs about recent publications and conducted database searches on request from archivists nationwide. It also makes available at cost copies of publications in the NARA library, many of which fall into the "fugitive literature" category. Unfortunately, few archivists know about ALIC and even fewer use it. Chronic understaffing and a critical shortage of purchase funds has limited the growth of the service. Publicity has been discouraged for fear that the resulting requests would swamp the service.

CART has long recognized the need to organize and disseminate information to archivists about relevant automation literature. Richard Kesner's bibliographies in the 1980s were a direct response to this need, as was *Automated Records and Techniques in Archives: A Resource Directory*, compiled by several CART members and published in 1990.

The conference participants discussed proposals already before CART and the Editorial Board for a series of technical leaflets. *Automating the Archives*, pro-

duced by Richard Kesner and Lisa Weber, has already been published. The participants agreed that these leaflets would be valuable additions to the literature and would satisfy a currently unmet need.

The participants expressed a hope that NARA could be persuaded to increase its support for and the visibility of ALIC. There is no other institution that could begin to offer the service. The SAA office also needs to develop a more formal referral structure for responding to requests for technical assistance. Finally, individual archivists and the SAA office should also take full advantage of such new methods of communicating as the ARCHIVES listserv.

Outcomes of the CART Curriculum Project

The CART Curriculum Project has succeeded in its primary goal, the development of comprehensive learning objectives for archivists in the area of automated records and techniques. The learning objectives are presented on the following pages, introduced by a brief narrative section that explains their intended scope and content and their possible applications.

Following the learning objectives is a brief section, "Delivery Methods," that weighs the benefits and burdens associated with each of the education and training vehicles available to archivists in the United States.

Next are eight specific recommendations that evolved from the project's analysis and conclusions. The members of CART will be working over the next several years toward the implementation of these recommendations.

Finally, the section entitled "Responsibilities" spells out the actions that specific groups, inside and outside SAA, can and should take in response to this report. The number of groups identified in this section underscores the need for broad participation and cooperation in the effort if the desired ends are to be achieved.

It is hoped that this document provides both insights on existing conditions and guidance on how archivists can proceed in their efforts to address the challenges of complex and ever-changing technologies.

LEARNING OBJECTIVES

The learning objectives presented on pages 485–490 are an attempt to identify the knowledge and skills archivists need to acquire to meet the challenges of automation. The overall intention is to convey general principles rather than specific current practices. Rapid changes in technology mean that any specific examples or practices would quickly date the document, but many underlying principles remain constant and could be articulated.

As an example, there is a general objective about determining whether automated applications could improve current practices or services in an archival repository. This objective does not specify, however, that learners will evaluate the relative merits of particular software products in an archival setting. The bullets that follow each general objective are meant as illustrations or examples, not as comprehensive lists of what is covered by that objective.

Primary Goal for Implementation: Professionwide Exposure to the Foundation Cluster by the End of the Decade

No single archivist should or could learn everything outlined in the learning objectives. It is also unlikely that any one person is capable of teaching everything they contain.

At a minimum, however, we do strongly recommend that every archivist in the United States be exposed to the contents of the Foundation Cluster by the year 2000 (see “Recommendations”). This will ensure that the members of our profession have an adequate understanding of how archives fit

into the larger “information society” and have acquired a fundamental level of “computer literacy” to promote archival programs and policies within this context.

Archivists will pursue the learning objectives identified in the other three clusters at varying rates and in varying depths, depending upon their own interests and work responsibilities. It is likely that only specialists will fully master any one of the other clusters. Generalists may find it sufficient to acquire only an introductory or a mid-level understanding of the material represented in these clusters.

Links to Other Areas of Archival Curriculum

It is important to understand that this document does not stand in isolation. These learning objectives are inextricably linked to other key areas of the overall archival curriculum. The Foundation Cluster is intended to provide the bridge between an individual practitioner’s fundamental knowledge of archival theory and practice and the application of those principles in an automated environment. An individual needs solid grounding in basic archival principles before she or he can fully understand how automation affects and can be used in archival practice. Participants in the project agreed that, in their experience, individuals who were good electronic records archivists were good archivists to begin with.

If one were to map the contents of the other three clusters into the traditional archival curriculum, it would reveal a spiderweb of interconnections. At the core of the Electronic Records Cluster, for instance, are the processes of appraisal, description, reference, and preservation, all seen from the perspective of this specific record type. Anyone preparing a general archival educational program on one of these archival functions would presumably cover electronic records and the learning objec-

tives identified here along with those particular to other record forms.

Similarly, archival descriptive practices are now heavily dependent on automated applications, from basic word processing to complex USMARC-based communication systems. The contents of the Automated Applications Cluster could form the basis for a single course covering the entire cluster, or those learning objectives specific to the preparation of finding aids could be integrated into a general course on descriptive practices, both manual and automated.

Finally, those managing archival programs, large or small, increasingly recognize the value of management techniques like strategic planning. Depending on their institutional setting, they might also find themselves competing for resources and visibility in a highly sophisticated and dynamic environment that requires new communication and organizational skills. Add automation to this mix, in organizations that are developing information policies or pursuing information resources management with vigor, and archivists must bring a whole range of new skills to bear in a highly complex and technical environment. The Management Cluster addresses these needs, some of which are specific to automation but most of which are applicable to effective management in any situation.

Applications and Uses of the Learning Objectives

Individual archivists can measure their own progress with special attention to the contents of the Foundation Cluster; as asserted above, we believe that all archivists in the United States should have been exposed to the items listed in the Foundation Cluster by the year 2000. They may also identify in the other clusters areas that they would like to pursue in greater depth.

SAA and other professional associations can use this as a planning and evaluation document. Are existing educational offerings (workshops, publications, and other resources) adequate to ensure members are exposed to the Foundation Cluster objectives in the next seven years? Which objectives should be covered in manuals, technical leaflets, or other publications? Which should form the basis for workshops or conferences?

Educators and instructors can evaluate the contents of their syllabi and include relevant learning objectives in graduate courses, workshops, and other offerings. They can also encourage students to pursue research that will advance archival understanding of new technologies and resulting societal changes that affect recordkeeping.

LEARNING OBJECTIVES FOR ARCHIVISTS IN AUTOMATED RECORDS AND TECHNIQUES

The learning objectives are organized into four broad clusters, each of which contains from four to eight general objectives. Each general objective is followed by a number of bulleted items, which are intended to provide examples or illustrations of the types of subject matter that might be covered in specific educational offerings addressing the objective. The bulleted items are not, however, meant to be complete or comprehensive lists of all topics within each objective.

FOUNDATION CLUSTER

The Foundation Cluster provides an overview and introduction to the material presented in the other three clusters. It is intended to be a bridge between fundamental archival theory and practice and the additional knowledge and skills required to meet the challenges presented by automation. The content is intended to provide a common vocabulary and base of understanding about how automated systems operate and how they affect recordkeeping practices in order to prepare the archivist for the more advanced topics covered in the following clusters.

Archival Perspectives

Interprets archival theory and practice in the context of automation and examines the functions and responsibilities of archivists and archival institutions in organizations with advanced technology applications.

Historical context. The archivist will become familiar with the history, development, and use of automated information systems, communications, and telecommunications by organizations and individuals in order to compare and analyze differences between mutual and automated recordkeeping.

- History of computing and automation
- Impact on organizations and society
- Successive changes in recordkeeping practices
- Projected trends

Impact on archival concepts and theory. The archivist will understand the impact of automation on basic archival concepts and theory, on the nature of records, and on recordkeeping practices.

- Definition of a record

- Provenance, original order, respect des fonds
- Legal admissibility of records
- Intellectual ownership and copyright
- Access, confidentiality, security, and ethics

Information flow and management policy. The archivist will understand how the structure of organizations affects the ways in which information is collected and disseminated and the documentation produced. The archivist will be introduced to the basic elements of information policy and be able to articulate specific archival concerns that should be addressed in an information policy developed for a particular organization or institution.

- Existing information policy legislation and regulations
- Impact of existing policy on archival practice
- Information policies in various types of organizations

- Components of an institutional information policy statement
- Archival considerations during development of a policy

Archives and other information disciplines. The archivist will be able to explain how archival science is related to other information-based disciplines, including information science, library science, computer science, and information resources management. The archivist will identify shared concepts and terminology and list areas in which archival practice makes unique contributions to the overall creation, management, use, dissemination, and preservation of information.

- Terminology distinct to each discipline
- Fundamental concepts and principles of each discipline
- Comparisons to archival terminology, concepts, and principles
- Principal professional associations serving each discipline
- Primary publishers of professional literature within each discipline

Basic Concepts in Automated Information Systems

The archivist will become familiar with the basic concepts and terminology of automated systems in order to understand archival literature on automated records and techniques, to identify and select relevant literature from related disciplines, and to participate in a sequence of more advanced education and training courses.

Components of automated systems. The archivist will be able to identify the basic components of automated information systems, describe their most common functions and applications, and compare their use by various types of organizations and individuals.

- Hardware, including computers, input and output devices, networks
- Software, including operating systems, programming languages, applications
- Storage media and methods, covering optical versus magnetic sequential versus random, multimedia systems
- Telecommunications, including networks, protocols, changes in communication patterns and practices

Information system analysis and design. The archivist will be able to apply basic systems analysis techniques to the design, development, or procurement of automated systems to support automated applications in archives and to analysis of automated information systems in organizations that produce archival records.

- Business function analysis
- Logical data models
- System design methodologies
- Flowcharting

Data structures. The archivist will become familiar with common data structures, be able to list notable differences in their logical and physical organization, and explain how they are commonly applied in organizations.

- Numeric data files
- Databases
- Text files
- Electronic documents
- Geographic information systems
- Computer-aided design files
- Spreadsheets
- Bit-mapped images
- Compound documents

Differences between manual and automated records. The archivist will identify and describe key differences in the nature of manual and automated records.

- Searchability
- Manipulability
- Compactness
- Fragility
- Hardware and software dependency

Functions and uses of automation.

The archivist will develop a general understanding of how and why organizations and individuals create and use information in electronic form. The archivist will identify the roles and relationships among various specialists within an organization and be able to contrast

these roles with those used to control records in manual systems.

- Common applications in organizations (governments, academic institutions, businesses and manufacturing enterprises, not-for-profit organizations)
- Functional responsibilities and relationships within organization re: automation (chief information officers, records managers, archivists, data librarians)
- Common applications of automation by individuals

AUTOMATED APPLICATIONS CLUSTER

The archivist will be able to identify the repository's organizational objectives and define the requirements of automated tools that can support those objectives, and the archivist will gain sufficient knowledge of automated techniques appropriate for control, management, and access to archival holdings to be able to select or design appropriate applications and oversee their implementation.

Common applications. The archivist will become familiar with common automated applications and how they can be used to improve the economy and efficiency of archival operations. The archivist will understand their capabilities and characteristics, the sources and services of major suppliers, and the standards applicable to each type of application.

- Word processing and office systems
- Database management systems
- Spreadsheets and financial management systems
- Bibliographic retrieval systems and networks
- Barcoding and other tracking systems
- Artificial intelligence
- Telecommunications, e-mail, FAX, other messaging systems

Defining organizational objectives.

The archivist will develop skills to understand the purpose of the repository in terms of providing information access

services to internal and/or external customers in order to define the purpose and function of automated solutions.

- Organizational mission
- Business function analysis
- Analysis of customer needs
- Client identification
- Information-handling requirements and information flow
- Organizational operational requirements

Technology overview. The archivist will learn how to locate current information, background materials, and guidance on potential technological solutions to the repository's organizational objectives.

- Sources of technology reviews and overviews
- Identifying and understanding standards

- Obtaining information from vendors
- Organizations and associations serving the information professions

Selecting solutions. The archivist will be able to examine and evaluate existing practices and work patterns within the repository in order to determine whether automated applications could be used to improve current practices or services.

- Development of functional specifications (functionality, compatibility, standards, physical constraints)
- Cost versus benefit analysis
- Requirements for developing solution specifications

Implementing solutions. The archivist will learn the steps necessary to implement an automated application in order to lead or contribute to an organizational effort to implement and operate a technological solution to service delivery within the repository.

- Implementation planning
- Change management
- Training (staff and public)
- Documentation
- Adaptation of planned solution to actual implementation
- Working in teams

ELECTRONIC RECORDS CLUSTER

The archivist will gain sufficient knowledge of electronic records necessary for supporting their institutions in the identification, appraisal, acquisition, access to, and preservation of electronic records.

Evaluation of practice. The archivist will understand the various methods and techniques that have evolved for the management of electronic records in a variety of contexts, both active and archival.

- Data archives
- Traditional archives
- Active organizations
- Noncustodial archives
- Document management environments

Characteristics of electronic records. Building on the knowledge of basic characteristics introduced in the Foundation Cluster, the archivist will understand the differences among various business applications and the types of automated records systems and file structures.

- Transactions
- Geographic information systems

- Database management systems
- Office systems

Determining value. The archivist will understand the nature of electronic records and their content, context, and provenance, sufficient to determine their administrative, legal, fiscal, research, and other values.

- Concept of "continuing value"
- Evidential value of electronic records
- Informational value of electronic records
- Evaluating provenance and context
- Risk assessment
- Value-added concepts and techniques

Metadata. The archivist will understand the nature and utility of metadata and how to interpret and use metadata for archival purposes.

- Definitions of *metadata*

- Metadata structures
- Metadata standards, especially information resource dictionary systems (IRDS)
- Uses for metadata in administration of electronic records

Description. The archivist will be able to describe common methods for description and the standards for descriptive elements needed to ensure long-term access and use of electronic records.

- Descriptive requirements for electronic records
- Descriptive standards
- Evaluating and managing documentation
- Common descriptive practices

Preservation. The archivist will understand threats to the longevity of information in electronic form, maintenance requirements for existing storage media, and strategies to ensure that electronic records remain understandable, accessible, and usable.

- Preservation hazards for electronic records
- Preservation of magnetic and optical media
- Migration issues and strategies
- Information technology standards that support continuing access

- Advantages and disadvantages of various storage media

Reference services. The archivist will understand the components of reference services, learn how to identify user requirements, and determine how to apply methods and technologies to meet user needs for access to electronic records.

- Identifying user communities and user requirements
- Promoting use of electronic records
- Model practices for electronic reference services
- Privacy and access issues

Implementation strategies. The archivist will define his or her role within the organization for implementing an effective program to manage electronic records and to ensure their long-term preservation and use.

- Program elements for electronic records programs
- Relationship between electronic records and other program elements
- Resource requirements
- Program planning and evaluation
- Strategies for gaining support and sustaining programs

MANAGEMENT CLUSTER

The archivist will acquire the necessary management skills especially those required for implementing automated systems and developing electronic records programs. The archivist will learn to use strategic planning in managing his or her own program and in aligning the archives' efforts with those of the parent institution. The archivist will understand the importance of positioning the archives within the broader context of institutionwide information resource management and information policy formation.

Core management competencies. The archivist will acquire general management skills, especially as they relate to the implementation of automated sys-

tems and development of electronic records programs.

- Program planning and development, especially strategic planning

- Budgeting and personnel management
- Space and facilities planning
- Legal and ethical issues for archives

Organizational dynamics and change management. The archivist will understand how technological change affects organizations and the people who work in them and the resulting effects on information flow and documentation.

- Organizational assessment and change modeling
- Technology transfer and adaptation
- Groupwork and groupware
- Worker productivity and employee development

Information policy formation. The archivist will understand how organizations are developing more formal information policies to protect their "information assets" and the resulting effects on information ownership, access, and dissemination in order to participate effectively in policy development.

- Information as an organizational asset
- "Ownership" of data
- Access, security, and privacy
- Resource sharing
- Policy formation

Environmental scanning/technology scanning/reengineering. The archivist will learn to assess external conditions and opportunities that may influence archival activities, to use benchmarking for evaluating current archival program performance, and to reengineer processes for improved performance.

- Environmental and technology scanning
- Total quality management principles and application
- Understanding customer requirements
- Benchmarking and process reengineering

Marketing and entrepreneurial skills/influencing. The archivist will learn effective means to communicate archivists' needs and capabilities to those they serve and from whom they require resources.

- Marketing archival services and the mission of archives
- Assessing customer/client/patron needs
- Defining mutually beneficial activities
- Negotiating "win/win" alliances
- Intrapreneurialism and entrepreneurialism

DELIVERY METHODS³⁰

With the establishment of learning objectives comes a need to develop delivery vehicles so that the objectives are effectively incorporated into the curriculum. A variety of delivery vehicles exist, including workshops, institutes, graduate education programs, internships and residencies, and

distance education. Each involves different burdens for the educators, students, and their institutions. Each is appropriate for only certain types of objectives and varies in its feasibility and effectiveness.

Workshops

Workshops provide short bursts of education (typically one- or two-day sessions) often in the context of another, larger professional event or activity, such as an

³⁰This section of the report was prepared by Thomas E. Brown on behalf of the Committee on Automated Records and Techniques.

association annual meeting. Workshops work well for imparting new concepts and skills of a technical and practical nature. They offer the ability to focus on specific subjects and, although they may not present a coherent whole, other information can be imparted by other workshops and delivery vehicles.

Most workshops have been led by fellow practitioners who can discuss the subject matter from a practical point of view. But the preparation of such workshops by practitioners rather than educators is labor intensive and thus is a burden on the presenter's institution or on individuals who cannot accept honoraria.

Institutes

Institutes typically last one to two weeks and are better for presenting broad strategies and full curriculums. They may be less effective for dealing with specific subjects of a practical or technical nature. Because participants spend an extended period of time together, they often develop strong personal ties and come to rely on this network for help and assistance after the institute has ended. However, the full-time nature of extended institutes represents a major resource commitment for the organizers, participants, and their parent organizations.

Graduate education

Graduate education for archival work is available in a variety of contexts, from scattered courses to fully developed master's degree programs in archival studies. Graduate archival education has a comprehensive learning structure that allows students to draw from a variety of different disciplines, such as library science, business administration, and computer science. Thus these programs can incorporate the latest developments and theories, and, while more effective for broad strategies and full curriculums, they can also focus on sub-

jects and skills. Since educational institutions exist as delivery vehicles for a variety of curriculums, a graduate education program does not represent an additional burden.

Unfortunately, only a limited number of archival programs exist. Consequently, participation in graduate education may require physical relocation and may therefore preclude working full time. The burden this situation imposes on the participant may mean that, for many, graduate education is not feasible. Furthermore, graduate education consists of courses that meet over a period of weeks or months, and the different courses are rarely offered at the same time. Thus the acquisition of skills and knowledge through graduate education requires a time commitment that may not be appropriate for an archivist or archival institution facing immediate problems and challenges.

Internships or residencies

Internships or residencies offer opportunities for individuals to spend several months working in established archival programs. They impose on the host institution the significant burden of providing intensive training for the intern or resident; this burden is only partially offset by the work the individual is able to accomplish during his or her stay. Currently, the archival profession has three ongoing programs for electronic records which could host an intern: the National Archives and Records Administration, the New York State Archives and Records Administration, and the National Archives of Canada. Quite clearly, these institutions do not have the resources both to fulfill their mission and to train the profession.

Internships, like workshops, tend to be most effective in imparting practical skills rather than broad strategies and theories. As such, they are probably most effective when taken in conjunction with a graduate

education program, but, as a result, they present to internees or residents many of the same problems posed by graduate education programs.

Distance Education

Distance education provides opportunities for learning through structured course materials that an individual can use at his or her own pace either at home or in the workplace. An instructor corresponds with the learner either by mail or telephone or through electronic media and provides reading materials, video- or audiotapes, computer programs, and other learning tools.

Distance education can be appropriate for delivering both broad theories and specific subjects. It also offers equitable delivery of the curriculum and has none of the problems of relocation or work disruption associated with graduate education or internships. However, the development of effective distance education is probably the most difficult of any of the delivery vehicles. Thus it imposes significant burdens on those offering the training. Whether the program is based in an educational institution or ongoing archival program, it represents an additional responsibility for each kind of institution and its employees. Distance education is also difficult to update, which presents a particular problem for rapidly changing fields involved with technology.

The Best Solution?

Because there are pros and cons for each of the delivery vehicles, no single vehicle is appropriate for all topics, for all students, and in all situations. The best solution is probably a creative mix of all the delivery vehicles.

RECOMMENDATIONS

Recommendation 1: SAA's Committee on Automated Records and Techniques

(CART) should seek approval of the learning objectives as a guideline in developing archival educational programs both within and outside of SAA.

CART should confer with the SAA Standards Board about the procedures for considering all or part of the learning objectives document as a formal SAA standard.

CART should work closely with the Committee on Education and Professional Development (CEPD) to ensure that all CEPD documents (especially its "Guidelines for a Master's degree in Archival Studies") are consistent with and incorporate appropriate concepts from the CART Learning Objectives.

CART must establish a system for periodic review of the objectives. To be consistent with SAA standards procedures, it should set a three- to five-year review cycle for the document and assign responsibility for promoting and monitoring implementation of the objectives.

Recommendation 2: SAA Council should adopt as a goal of the Society of American Archivists that, by the year 2000, every archivist in the United States should have been exposed to the contents outlined in the Foundation Cluster of the CART Learning Objectives.

To achieve this goal, the effort needs to be heavily promoted and publicized so that it becomes a foundation for planning in every aspect of the Society's activities. SAA will have to review its own educational offerings and publications to make sure that its members have available all the tools possible to acquire the knowledge and skills outlined in the Foundation Cluster. In addition, SAA must work actively with both graduate educators and employers to raise awareness about the contents and impor-

tance of the learning objectives, enhance existing programs for their delivery, and develop new opportunities.

Recommendation 3: An institute for archival educators should be developed in order to convey basic knowledge about automated records and techniques and to provide curriculum materials for their use in their classrooms and in continuing education programs.

Archival educators need assistance both in upgrading their understanding of technological topics and in integrating these topics into the curriculum. An institute would provide an ideal setting for conveying specific knowledge and for developing curricular materials that could be used in the educators' own classrooms.

Recommendation 4: Archivists should focus on the use of the case method as a principal vehicle for presenting education on every topic but especially in the areas of electronic records and automated applications in archives.

Case teaching is one of the most effective ways of teaching individuals the necessary decision-making and problem-solving techniques they will need in this rapidly evolving field. CART should review the results of the Kesner and O'Toole workshop on the case method to be held in September 1993 and consider what further action is necessary. The Institute for Archival Educators described in Recommendation 3 should also incorporate the case method as a principal teaching tool.

Recommendation 5: Consider establishing an ongoing institute on the management of electronic records modeled on the National Association of Government Archives and Records Administrators Institute for State

Archives and Records Administrators held at the University of Pittsburgh.

Reaction among attendees at the NAGARA institutes has been largely favorable. Archivists outside of state government could easily benefit from the opportunity for extended discussions and consultations afforded by a one- or two-week institute. Although there are substantial logistical and expense burdens associated with such an undertaking, the CART project participants encourage developing an institute of this type for another audience, perhaps university-based archivists, to test its feasibility and effectiveness.

Recommendation 6: SAA's Education Office Advisory Committee and Education Officer should review SAA's program of continuing education to advance coordination and cooperation with other organizations and institutions. The emphasis in workshop offerings should be on the introduction of new concepts and basic information transfer.

SAA must strengthen its coordination and standards-setting role in education of all kinds. Workshops can and should be offered, but everyone must recognize that they are best for introducing archivists to new concepts and conveying very basic kinds of information.

In terms of the CART Learning Objectives, SAA workshops should largely focus on delivering the contents of the Foundation Cluster. Some workshops might also provide brief overviews of the other three clusters, but no one should expect to meet all of the learning objectives through workshops alone. Basic or introductory workshops must be repeated often to meet the needs of new sets of learners.

Recommendation 7: NARA and other repositories with established electronic

records programs should offer formal internships or residencies to archivists from other institutions wishing to establish their own programs.

Participants acknowledged that it is impossible to acquire in short-term workshops or institutes sufficient expertise to implement electronic records programs. Internships or residencies would provide hands-on training under the guidance of experienced professionals. The intern or resident could then transfer the training to her or his home institution.

NHPRC should consider establishing a program, similar to its management internships, to place individuals for six months or a year in these institutions that have established electronic records programs.

Because this process is intended not as an introduction but as an aid to implementing advanced programs, applicants should be experienced archivists who can demonstrate that they have thoroughly mastered at least the Foundation Cluster before being accepted for an internship or residency. Their home institution should also be committed to supporting their work on electronic records program development.

Recommendation 8: SAA should use the CART Learning Objectives systematically to review its publications, existing and forthcoming, and should consider developing titles (especially in the form of technical leaflets) that address specific topics identified in the objectives.

There is a critical need for written materials in the area of automation, both to provide background reading for students in formal educational settings and to deliver information directly to individual practitioners. SAA could probably cooperate with NAGARA, which has already issued a number of leaflets in related areas.

Employers, especially the National Archives and Records Administration, should be encouraged to provide to employees who have acquired special expertise on these topics sufficient release time to prepare the text of these publications.

RESPONSIBILITIES

Every segment of the archival community has responsibilities for implementing the recommendations outlined above as well as continuing larger obligations to ensure that archivists and the organizations they serve are prepared to meet the challenges of the future.

Individual archivists

Each archivist must remain open to change and seek out deeper understanding of the issues and principles presented by new technologies. They have an obligation to continue to learn throughout their careers.

Employers

Employers must provide their employees with the time and financial support to pursue educational opportunities and to share their experiences with others. Each repository's institutional climate should encourage its staff to continue to learn and incorporate innovations in ways appropriate to the needs of the employees and the users of the records.

Professional Associations

Professional associations must provide overall leadership in identifying needs, establishing priorities, and promoting widespread understanding of the issues at hand. They do not need to be the sole or even primary supplier of education, but they do need to coordinate and set standards to ensure quality and availability for all.

Specific responsibilities are assigned to particular groups or organizations as outlined below.

Within the Society of American Archivists

Council

- Incorporate automation- and education-related priorities into the Society's planning processes and programs.
- Ensure that all SAA subgroups are aware of this document and are encouraged to incorporate its recommendations into their own program planning, as appropriate.
- Based on CART's recommendations, consider establishing as a goal of the Society that every archivist should be exposed to the contents of the Foundation Cluster by the year 2000.

Committee on Automated Records and Techniques (CART)

- Recommend to Council that it should establish as a goal of the Society that every archivist should be exposed to the contents of the Foundation Cluster by the year 2000.
- Develop proposal for technical leaflets to address specific learning objectives in cooperation with the acquisitions editor and the Editorial Board.
- Reevaluate existing workshop offerings, in cooperation with the Educational Office Advisory Board, to determine how best to meet and integrate learning objectives.
- Work actively with CEPD to ensure that guidelines for overall archival education, especially the forthcoming guidelines for a master's degree program, appropriately incorporate the CART Learning Objectives.
- Work actively with and provide over-

all leadership and consistent encouragement to other subgroups in carrying out the recommendations of this project.

Archival Educators (via Committee on Education and Professional Development, Archival Educators Roundtable, and Education Office Advisory Board)

- Ensure that guidelines for overall archival education, especially the forthcoming guidelines for a master's degree program, appropriately incorporate the CART Learning Objectives.
- Review contents of existing SAA workshops to determine how to meet and integrate CART Learning Objectives.
- Establish mechanisms to provide basic introductory workshops.
- Continue to work with regional archival associations and other allied groups to offer educational opportunities to as wide an audience as possible.

Committee on Goals and Priorities (CGAP)

- Incorporate automation- and education-related priorities into the Society's planning processes and encourage subgroups to do likewise. Specifically, work to meet the goal of exposing all members of the profession to the Foundations Cluster by the year 2000.

Committee on Archival Information Exchange (CAIE)

- Review the learning objectives generally, and those under the Automated Applications Cluster specifically, and work with CART to ensure that they continue to reflect needs in the area of automated information exchange.

- Review, with CART, the contents of existing workshops and publications to incorporate the learning objectives where appropriate.

Editorial Board and Acquisitions Editor

- Review backlist and proposed titles to identify gaps.
- Work with CART to develop technical leaflet series.

Committee on Institutional Evaluation and Development

- Review principles of institutional evaluation to ensure that repositories' responsibilities in the area of new technologies are adequately addressed. Also, consider adding a requirement for sufficient support to enable staff to pursue continuing education.

Other Organizations and Institutions

Academy of Certified Archivists

- Incorporate content from CART Learning Objectives in certification examination questions.
- Encourage ACA members to upgrade understanding and skills in the area of automation as part of the recertification process.

National Archives and Records Administration

- Support and publish research in automation-related areas.
- Continue to support staff participation in professional committees.
- Provide formal training opportunities

to the professional community, especially in advanced and technical areas.

- Make the Archives Library Information Center (ALIC) the primary clearinghouse of publications and other information sources about archives and records programs in the United States.
- Provide release time for staff members to prepare needed publications (technical leaflets, reports, manuals) especially on issues related to electronic records and other new technologies.
- Offer opportunities for professional residencies.

Graduate Archival Education Programs

- Review existing syllabi and other curricular materials to determine how best to integrate CART Learning Objectives into graduate archival education programs.
- Educators themselves should pursue necessary continuing education opportunities to ensure that they maintain their understanding about rapidly evolving technologies and their implications for archival practice.
- Encourage students to pursue the research agenda outlined in the National Historical Publications and Records Commission's *Research Issues in Electronic Records* (1991).

National Historical Publications and Records Commission

- Consider establishing an electronic records internship program, similar to NHPRC management internships, that would place individuals in repositories with established electronic records programs for six months to a year.

Appendix I

Project Participants

First Conference, March 1991

- Thomas E. Brown, National Archives and Records Administration
- Frank G. Burke, University of Maryland
- Mary C. Chobot, Consultant
- Richard J. Cox, University of Pittsburgh
- Luciana Duranti, University of British Columbia
- Terry Eastwood, University of British Columbia
- Timothy Ericson, University of Wisconsin-Milwaukee (Acting SAA executive director at the time of the conference)
- Carolyn Geda, Interuniversity Consortium for Political and Social Research
- Bonnie Hardwick, University of California, Berkeley
- Margaret Hedstrom, New York State Archives and Records Administration
- James Henderson, Maine State Archives
- Jane Kenamore, Society of American Archivists (Project Director)
- Richard M. Kesner, Babson College
- Linda Matthews, Emory University
- Michael L. Miller, Environmental Protection Agency (Chair of CART at the time of the conference)
- Leon Stout, Pennsylvania State University
- Nancy Sahli, National Historical Publications and Records Commission
- Victoria Irons Walch, Consulting Archivist (Project Coordinator)
- Lisa Weber, National Historical Publications and Records Commission

Second Conference, November 1991

- Anne Diffendal, Society of American Archivists (SAA Executive Director)
- Margaret Hedstrom, New York State Archives and Records Administration
- Jane Kenamore, Society of American Archivists (Project Director)
- Richard M. Kesner, Babson College
- James M. O'Toole, University of Massachusetts, Boston
- Leon Stout, Pennsylvania State University
- Kenneth Thibodeau, National Archives and Records Administration
- Victoria Irons Walch, Consulting Archivist (Project Coordinator)
- William Wallach, University of Michigan

Appendix II

Earlier Versions of Learning Objectives Developed by the Automated Records and Techniques Task Force

AUTOMATED RECORDS AND TECHNIQUES TASK FORCE LEARNING OBJECTIVES VERSION 1 (1981)

	LEVEL ONE	LEVEL TWO
	SEMINAR Introduction to Computers and What They Are	SEMINAR Introduction to the Management of Machine-Readable Records
WORKSHOP Records Management of Machine-Readable Records	The archivist will identify the various types of processing, master, and output files common to most machine- readable systems.	The archivist will compare statistical analysis systems with database management systems.
WORKSHOP Appraisal of Machine-Readable Records	The archivist will identify the different elements in a data hierarchy. The archivist will discuss the manipulability of a machine- readable file.	The archivist will analyze the internal structure of a fixed-length record. The archivist will discuss the research value of a machine- readable file.

(continued on page 499)

AUTOMATED RECORDS AND TECHNIQUES TASK FORCE
LEARNING OBJECTIVES
VERSION 1 (1981), continued

	LEVEL THREE	LEVEL FOUR <i>Beyond the Core Curriculum</i>
WORKSHOP Records Management of Machine-Readable Records	The archivist will determine, through a discussion of the documentation, which files are the processing, master, and output files in a computerized system. The archivist will determine the time for disposal of the processing, master, and output files in a computerized system.	
WORKSHOP Appraisal of Machine-Readable Records	The archivist will determine the readability of a machine-readable file. The archivist will interpret the internal structure of a variable-length record by comparing one or more records with the documentation. The archivist will interpret the internal structure of a hierarchical file by comparing one or more records with the documentation. The archivist will determine the adequacy of the documentation accompanying a machine-readable file. The archivist will compare and contrast the research value of a machine-readable file with that of alternative records.	The archivist will test hypotheses about two different groups and about different measures of the same group. The archivist will validate each record of a file with the documentation and will correct and/or describe any inconsistencies.

(continued on page 500)

**AUTOMATED RECORDS AND TECHNIQUES TASK FORCE
LEARNING OBJECTIVES
VERSION 1 (1981), continued**

	LEVEL ONE	LEVEL TWO
	SEMINAR Introduction to Computers and What They Are	SEMINAR Introduction to the Management of Machine-Readable Records
WORKSHOP Describing and Documenting Machine-Readable Records	The archivist will analyze the elements of a traditional archival description of a machine-readable file. The archivist will identify the minimum necessary elements of documentation to determine the technical and intellectual characteristics of a machine- readable file.	The archivist will identify the elements of a catalog description of a machine-readable series in a standardized format.
WORKSHOP Accessing Machine-Readable Records		The archivist will determine how various utility programs common to most computer centers can be applied to processing machine- readable records. The archivist will determine if the technical specifications of various systems can process selected files. The archivist will discuss the uses of extracts, low-level aggregations, random error, and in-house analysis of data in order to release restricted information.
PROFESSIONAL ACTION KIT Preservation of Machine-Readable Records		The archivist will discuss the advantages and disadvantages of various storage media.

(continued on page 501)

**AUTOMATED RECORDS AND TECHNIQUES TASK FORCE
LEARNING OBJECTIVES
VERSION 1 (1981), continued**

	LEVEL THREE	LEVEL FOUR Beyond the Core Curriculum
WORKSHOP Describing and Documenting Machine-Readable Records	The archivist will describe a series of machine-readable records in a format appropriate to a traditional archival series description. The archivist will catalog a machine-readable series in a standardized format. The archivist will evaluate the quality of the elements in the documentation for machine-readable records at various levels of completeness. The archivist will prepare documentation for distribution to researchers.	The archivist will develop all necessary elements of documentation in a situation in which some elements were incomplete or in error.
WORKSHOP Accessing Machine-Readable Records	The archivist will execute utility programs. The archivist will identify files that can support various research designs. The archivist will develop a strategy to create public use extracts from restricted files.	The archivist will modify utility programs. The archivist will develop strategies to release information from a restricted file through low-level aggregation, random error, and analysis according to researcher specifications.
PROFESSIONAL ACTION KIT Preservation of Machine-Readable Records	The archivist will outline a storage and preservation program for a data archives.	The archivist will write a program to reformat a machine-readable file from a less useable format to a more useable format (e.g., from packed decimal to EBCDIC).

AUTOMATED RECORDS AND TECHNIQUES TASK FORCE LEARNING OBJECTIVES VERSION 2 (1983)

EDUCATIONAL PROGRAM FOR MACHINE-READABLE RECORDS

1. Learning Objectives

- 1.1 The archivist will learn how machine-readable records are created. This will include data collection techniques, coding of source documents, logical organization of data, use of processing files to create master files, the updating process, and possible output.
- 1.2 The archivist will learn the management of machine-readable records through survey and inventory processes.
- 1.3 The archivist will learn to develop records control schedules for automated records systems.
- 1.4 The archivist will determine whether sufficient documentation exists to accession a file into archival custody.
- 1.5 The archivist will determine the informational value of a machine-readable file through an analysis of (a) the units of analysis, (b) the level of aggregation, (c) the differences between administrative and survey data, and (d) linkage potential.
- 1.6 The archivist will understand the types of information needed to describe machine-readable data files in a standardized format.
- 1.7 The archivist will describe one or two files in a standardized format.
- 1.8 The archivist will determine how to process machine-readable records in order to make them available for research.
- 1.9 The archivist will discuss the dissemination of files with restricted information.
- 1.10 The archivist will discuss the research communities for machine-readable data.
- 1.11 The archivist will discuss preservation techniques to ensure the integrity of machine-readable data files in archival custody.

2. Course Outline

2.1 *Automated Records Systems*

The workshop leader will present an overview of the process through which automated records systems process information. This will include data collection techniques, coding of source documents, logical organization of data, the use of processing files to create master files, the updating processes, and possible output.

2.2 *Examples of File Creation*

The workshop participants will analyze the creation of the Ethnic Data Master File, the Combat Area Casualty File, and a hypothetical database.

2.3 *Management of Machine-Readable Records*

The workshop leader will discuss the management of current machine-readable records through surveys and inventories.

2.4 *Exercise*

The workshop participants will complete an inventory form for the Combat Area Casualty File.

2.5 *Scheduling Machine-Readable Records*

The workshop leader will explain how to use the information collected during surveys and inventories to schedule the components of automated records systems.

2.6 *Documentation*

The workshop leader will explain the technical and informational documentation needed to accession records into archival custody.

2.7 *Exercise*

The workshop participants will validate the record layout and codebook of the Combat Area Casualty File.

2.8 *Exercise*

The workshop participants will apply a decision chart analyzing the units of analysis to the Combat Area Casualty File, the Ethnic Data File, and the National Roadside Survey.

2.9 *Importance of Microdata*

The workshop leader will explain the importance of microdata through an analysis of the Combat Area Casualty File.

2.10 Analysis of Survey Data

The workshop participants will apply thirty-nine appraisal criteria for survey data to the National Roadside Survey.

2.11 Linkage Potential

The workshop leader will explain how linkage potential enhances the informational value of a machine-readable data file and use the Ethnic Data File as an example.

2.12 Descriptive Information

The workshop leader will explain the terminology used to describe machine-readable data files.

2.13 Exercise

The workshop participants will complete a description of the Combat Area Casualty File and/or the National Roadside Survey File.

2.14 Processing Machine-Readable Data Files in Archival Custody

The workshop leader will discuss the processing of machine-readable data files by using utility programs and statistical analysis packages in order to make them available for research.

2.15 Exercise

The workshop participants will create an SAS file format statement for the Combat Area Casualty File.

2.16 Public Use Files

The workshop leader will discuss the problems in the dissemination of records with personal identifiers and determine how to overcome these problems with public use files.

2.17 Outreach

The workshop leader will discuss the potential research clientele for machine-readable data and different methods for establishing productive relationships with these researchers.

2.18 Preservation

The workshop will discuss a strategy for establishing a program for the preservation of machine-readable information in archival custody.

3. Course Materials

- 3.1 A Selected Bibliography
- 3.2 A Glossary of Computer Terms
- 3.3 Appraisal of Machine-Readable Records: Workbook
- 3.4 Appraisal of Survey Information
- 3.5 Appraisal Guidelines in the Machine-Readable Archives Division, Public Archives of Canada
- 3.6 Data Element Dictionary for Describing Machine-Readable Data Files (MRDF)
- 3.7 Copies of overhead transparencies
- 3.8 Outlines of individual module presentations

**EDUCATIONAL PROGRAM FOR AUTOMATED TECHNIQUES
IN ARCHIVES****1. Learning Objectives**

- 1.1 The archivist will first become acquainted with the overall fields of electronic data processing (EDP) and telecommunications through a brief consideration of EDP concepts, terminology, equipment (hardware), and systems (software). This information will be presented in such a manner as to emphasize to implications of these developments for information managers in general and archivists in particular.
- 1.2 The archivist will then be introduced to various approaches to institutional self-appraisal and needs assessment. The purpose in doing this is to emphasize that one cannot successfully move from manual to automated systems until one has a firm grasp of existing in-house information delivery systems, the quality of their performance, and areas in need of change or further development.
- 1.3 The archivist will next learn how to evaluate the EDP resources of his or her own or parent institution's data/communications center. The objective here is to establish the availability of in-house computer power before turning to outside EDP options.
- 1.4 As the second phase in the planning/implementation process, the archivist will learn how to develop a planning team and the necessary tools to complete the planning process.

- 1.5 With planning well under way, the archivist will consider various approaches to the establishment of an action plan, including the use of tools for the selection of computer hardware and software and related EDP services.
- 1.6 Once all of the decisions have been made, the archivist still faces the considerable task of implementation. During the workshop, the archivist will examine problems associated with the transfer of procedures from a manual to an automated mode, the inputting of archival data, the design of computer-generated reports, and the documentation of systems once established.
- 1.7 The archivist will then be asked to draw on this training to complete, in conjunction with colleagues and the workshop staff, a number of planning/implementation scenarios. The exercises are designed to address the problems that the archivist is likely to face in her or his own shop.

2. Course Outline

2.1 *Introduction to Electronic Data Processing and Telecommunications*

A lecture/audiovisual presentation encompassing hardware, software, networking, and integrated systems options as they are currently available and as they are evolving in the marketplace. The approach will be practical and therefore geared to the EDP realities that one finds within archival programs or available to them through their parent institutions.

2.2 *Planning for Automated Systems in Archives*

A seminar presentation with considerable flexibility for audience questions and answers, role playing, and the consideration of the specific institutional problems of those in attendance. Subjects to be covered are institution self-analysis, archival holdings self-analysis, EDP options self-analysis, evaluation of ongoing manual information systems within the archives, the development of a planning tool for the shift from manual to automated techniques within the program, the establishment of a planning team, and the development of an action plan.

2.3 *Implementing Automated Systems in Archives, Part I*

A seminar presentation with considerable flexibility for audience questions and answers, role playing, and the consideration of the specific institutional problems of those in attendance. Subjects to be covered are hardware and software evaluation and selection, the financial aspects of computer acquisitions, vendor negotiations, and in-house and external funding sources.

2.4 *Implementing Automated Systems in Archives, Part II*

A continuation of session 2.3. Subjects to be covered are implementation of an action plan, establishing a timetable and schedule for the action plan, the input process, the output process, system documentation and support, networking considerations.

2.5 *Case Study Scenarios*

The workshop will be subdivided into small groups along institution and collection management lines (e.g., by corporate, government, university repository, and perhaps by records management, machine-readable records, audiovisual records, or some other functional distinction).

Each working group will be provided with a set of general circumstances pertaining to the nature of their administrative and archival management problems. They will be expected to draw on their own practical experience to fill out this scenario. The workshop team will then issue each group a set of problems, such as an assignment to select a hardware/software configuration or develop procedures for entering data into an on-line system. Their charge will be to employ the tools that they have reviewed during the course of the workshop and resolve their assigned problems. Generally speaking, they will receive thirty to forty-five minutes to address a particular assignment before returning to the central meeting room to discuss their proposed solutions.

Other groups and the staff will serve as their critics and will review their efforts. The workshop leader will summarize the results of the first set of exercises before moving on to the next package. If time permits, each working group will have the opportunity to consider three different problems during the course of the workshop.

3. Course Materials

- 3.1 A course outline.
- 3.2 A copy of the bibliography, *Information Management, Machine-Readable Records, and Archives*
- 3.3 Copies of all planning tools and transparencies employed by workshop personnel
- 3.4 A variety of product literature as supplied by hardware and software vendors

AUTOMATED RECORDS AND TECHNIQUES TASK FORCE LEARNING OBJECTIVES VERSION 3 (1986)

AN EDUCATIONAL PROGRAM TO TRAIN ARCHIVISTS IN AUTOMATION

Learning Objectives and Course Content

A. Basic Computer Concepts

1. The archivist will understand the main components in an automated information or computer system.
2. The archivist will learn how data is stored digitally, in binary numbers, and in standard character codes.
3. The archivist will understand the data hierarchy in a computer system: data elements, records or logical records, files, and databases.
4. The archivist will distinguish storage devices as providing either sequential access or direct access.
5. The archivist will learn about different hardware components: central processing unit, main memory and registers, and peripheral devices.
6. The archivist will understand the difference in types of software; operating systems, application programs, commercial packages for specific functions.

B. Automated Techniques

1. The archivist will understand the organization and manipulation of data in an automated system.
2. The archivist will analyze the manual procedures and sources of information for an automated information retrieval system in terms of different types of output from the system.
3. The archivist will understand the decision-making process regarding the acquisition of an automated information system.
4. The archivist will create an exercise database on a microcomputer using commercial database management software.
5. The archivist will outline the procedures to evaluate, maintain, and expand an operational database.

C. Machine-Readable Records

1. The archivist will learn to inventory the components of automated information systems and then describe them.
2. The archivist will determine the informational and evidential value of a machine-readable file through an analysis of (1) the units of analysis, (2) the level of aggregation, (3) the differences between administrative and survey data, and (4) linkage potential.
3. The archivist will learn to develop records control schedules for automated records systems based upon the information gathered during the inventory and the decisions made during the appraisal.
4. The archivist will determine whether sufficient documentation exists to accession a file into archival custody.
5. The archivist will determine how to process machine-readable records in order to make them available for research.
6. The archivist will understand the types of information needed to describe machine-readable data files and the use of data in standardized formats.
7. The archivist will discuss the dissemination of files with restricted information.
8. The archivist will discuss the research communities for machine-readable data.
9. The archivist will discuss preservation techniques to ensure the integrity of machine-readable data files in archival custody.

Previous Experience

The above curriculum, defined by its learning objectives and course contents, is not new. Rather, archivists have used it to offer a variety of workshops, seminars, and training programs. As of October 1986, archivists have used this curriculum as the basis of thirty-two workshops during SAA annual meetings. In addition, the SAA Task Force on Automated Records and Techniques has used the above curriculum four times to present two-day workshops on machine-readable records and twice to present two-day workshops on automated techniques.
