Background Paper

Teaching Archivists About Information Technology Concepts: A Needs Assessment

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Abstract: With the growing use of information technologies in all aspects of work and leisure, automation and electronic records have become commonplace within most modern organizations. To address the varied and often complex user-support requirements associated with these developments, we must educate a new breed of information services professional. The traditional role models of archivist, records manager, librarian, museum curator, and the like will not suffice. The accompanying essay briefly describes the emerging information services environment, the special demands it places on archivists, the types of skills required in response to these articulated needs, and a strategy and criteria for a programmatic response. This paper was originally prepared for the Society of American Archivists' Committee on Automated Records and Techniques as part of a NHPRC-funded grant to develop an automation curriculum for the archival profession.

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AS A STARTING POINT to the development of an information technology and information resource management curriculum for archivists, let us agree upon certain basic operating assumptions:

1. Archives function as subunits of larger organizations and are therefore subject to the environmental, operational, and organizational changes influencing their parent institutions.
2. Archives are first and foremost service enterprises, providing diverse support to their constituents through the preservation and management of vital information.
3. Although archives can and do add value to the information resource management (IRM) processes of their parent institutions, they rarely exercise control or authority over the IRM policies, programs, or procedures of these larger organizations.
4. In a resource-scarce environment, archives are less likely to obtain the financial and human resources they require to perform their mission in an outstanding and comprehensive manner.
5. It is rare to find an organization in which key decision makers understand and appreciate the role of and services provided by the archives.
6. The automation of information storage and delivery systems has further complicated these circumstances by creating alternatives (some might say "rivals") to the archives, placing its institutional role in question and further raising the intensity of competition for scarce resources and senior management support.

Furthermore, developments in the deployment and use of new information technologies have transformed the archival landscape. More than ever, today's archivist is faced with a host of information formats and storage media, including paper documents, micrographic records, electronic machine-readable media (both floppy disks and tapes of various types), audiovisual materials (e.g., photographs, slides, and videotapes), and optical media (laser disks and CD-ROM). They must also contend with nonstatic information resources, such as computer databases and on-line data utilities. In addition, archivists must face the challenge of preserving and servicing an ever-growing body of information that is in part dependent upon aging information technologies for access and practical use.[1] Thus, for the archivist, the issues are many:

- Which records does the archives collect and preserve (the age-old question!) *and* in what format and medium?
- Once the decision is made to collect *and service* information in a particular format, how does the archives develop and maintain its capabilities to do so?
- How does the archives determine its more broadly defined information technology requirements and how are these reconciled with its other strategic and day-to-day operating requirements?
- How does the archives avoid technological obsolescence?
- How does the archives ensure technological compatibility, flexibility, and migratibility?
- Where will the financial and human resources come from to support the complex and expensive information technology infrastructure that will

[1]For a provocative view of current and emerging information media and formats, see James Martin, *Viewdata and the Information Society* (Englewood Cliffs, N.J.: Prentice-Hall, 1982). See also Richard M. Kesner, *Automation for Archivists and Records Managers* (Chicago: American Library Association, 1984), 12–31; and United Nations, Advisory Committee for Coordination of Information Systems, *Management of Electronic Records: Issues and Guidelines* (New York: United Nations, 1990).

necessarily grow out of the parent institution's demand for IRM services?
- What does the archivist do in terms of training and professional development to prepare himself or herself for these challenges?
- What are the responsibilities of the profession as a whole to assist archivists in this regard?

Confronted with the dramatic and rapid changes in the workplace, the task before the Society of American Archivists (SAA) Automated Records and Techniques Curriculum Project is formidable. Simply put, how can the profession prepare its membership to address these challenges effectively? The objective of this paper is to provide a personal response to this question based on many years of IRM experience in both the public and private sectors. The model presented below is meant to provoke discussion and to encourage a fresh approach to the professional preparation of archivists. This essay will serve a useful purpose even if its only impact is to make archival educators and field practitioners more aware of the IRM environment within which they operate and the need to respond to the organizational and operational changes wrought by innovative information technology applications.

To begin, I provide a series of definitions so that the remaining material may be approached from the basis of a common vocabulary and perspective. These definitions are framed in the context of the assumptions that opened this essay. The definitions sections ties directly into the vision of the archives as part of a larger constellation of information resource management services. The next section briefly analyzes the organizational environment within which the typical archivist operates, highlighting skill requirements and critical performance success factors. From this narrative, key education and training objectives are derived that, in my view, are essential to the development of the archivist. The article concludes with some specific programmatic recommendations.

Definitions

In mapping out a new strategy for the training of archivists, it is essential that we position the archival profession in a more comprehensive information resource management setting. To clarify this point, the reader needs to become familiar with the following terms:

Information utility. Within any organization, the information utility includes all of those resources, services, and facilities that comprise, process, and deliver information to the end user. More than computer hardware and software, an information utility is an approach to customer service which emphasizes availability, ease of access, economy, efficiency, and accountability to the community.

Information resource management. IRM is the economical and efficient management, servicing, and support of all information (in whatever format) that is of value to the organization. The value-added component of information resource management is the information utility's ability to deliver accurate, specific information to the end user in a timely manner.

Information services professional. Although the terms *archivist, records manager, librarian,* and *systems analyst* have relevance in today's information technology environment, the twenty-first century information utility requires the services of cross-trained, highly-integrated staffs of information technology professionals to act as facilitators, catalysts for change, standards monitors, and resource managers for complex, user-driven and user-controlled information delivery systems.

Strategic planning. Strategic planning is that process of thought and action that directs the long-term growth of an or-

ganization. It focuses on the clearly defined mission, goals, and objectives of the organization; assesses the available resources to bring these milestones to fruition; and establishes a method of performance measurement. The rigor of the process places considerable demands on management but is essential to corporate prosperity and hence to the interest of all stakeholders (i.e., organization members and those served by the organization).

IRM strategic planning. Information resource management strategic planning is a necessary subset of the parent institution's process. It is necessarily shaped by the goals and objectives of the greater organization and must complement the more global directives established in the corporate plan.

Enterprise. *Enterprise* may be used interchangeably with *organization* and *institution,* but it is the preferred term because it conveys action and the creation or delivery of value to the end user. Regardless of the strategic focus of the organization, enterprises must create "value" as perceived by their customers if they are to survive and prosper.

Evolving Organizational Environments and IRM

As we proceed toward the twenty-first century, organizations will become less bureaucratic, more complex, and global in their orientation. Their management structures will flatten, with senior executives playing a larger role in the direct management of people and processes. These players will map out the strategic programs for their organization, employing external alliances, resource sharing, outsourcing (i.e., the assignment of a business function to an outside vendor) and new information technologies to enhance their overall performance. Middle management will grow thin and serve primarily as a group of technical specialists developing policies, procedures, and applications for the rank and file. The vast majority of those remaining will contribute directly to value creation in terms of either products or services provided to the customers of the organization. In this more fluid, less hierarchical environment, most if not all employees will have both IRM and production responsibilities.[2]

Information technologies will continue to play a central role in this restructuring of the enterprise. They facilitate streamlining and encourage a more entrepreneurial operating mode among managers now freed from dependence on others for vital information. They also tend to foster linkages with external global partners. Operationally, information technologies allow senior management's involvement in day-to-day business processes and its communication with players throughout the organization. Furthermore, the ubiquitous and increasingly user-friendly nature of emerging information technologies has meant that line managers rather than technologists have taken charge of the resource, refocusing IRM requirements on core services and strategic business objectives.[3]

As a result, information service providers within the modern organization are concerned less with the efficient and economical storage of data and more with the proactive delivery of knowledge. Thus, the IRM shopping list includes such products as intelligent, personal computer–based tools for end users; future-focused decision support systems; business simulation software; and expert systems.[4] Throughout, the ob-

[2]See, for example, Charles R. Morris, *The Coming Global Boom* (New York: Bantam Books, 1990); John Naisbitt and Patricia Aburdene, *Megatrends 2000* (New York: William Morrow, 1990); and Tom Peters, *Thriving on Chaos* (New York: Knopf, 1987).

[3]Paul L. Tom, *Managing Information as a Corporate Resource,* 2nd ed. (New York: HarperCollins, 1991). See also James C. Emery, *The Strategic Imperative* (Oxford: Oxford University Press, 1987).

[4]For an excellent summary of what leading, international chief information officers (CIO) are looking

jective of these information technology scenarios is to empower the end user and to put this person in touch with the appropriate data to compete today and plan for tomorrow.

To manage the enterprisewide use of information technologies and services, organizations are currently experimenting with a number of different reporting and management structures. Many are moving toward the development of an information utility under the aegis of a chief information officer (CIO). Structurally, the information utility serves as an administrative umbrella for a mix of information technology enterprises that may include libraries, archives, records management programs, data centers, networks, technology training centers, media production and operations, and end-user documentation. However, the heart of the information utility concept has less to do with departmental structure than with service. As its name suggests, the information utility exists to provide capabilities to its customers. Through computer hardware and software, communications networks, documentation, and training, the information utility seeks to empower its users to exploit all available information resources.[5]

In focusing its information technology capabilities in the information utility, the enterprise is making a statement about the importance of these services within the organization. More to the point, the chief information officer usually sits in the organization's senior decision-making body and is instrumental in the development of internal and external linkages among information user communities. On the other hand, the information utility does not "own" corporate data and all of the associated systems and services. These tend to be the property of key customers. By contrast, the CIO and his or her team facilitate, coordinate, and support the structures that deliver the data and enrich its value to the end user. Information utility personnel are also responsible for the protection of the network and overall data integrity.

Thus, the typical information utility must function in an environment that is both centralized and decentralized. While maintaining and enhancing the organization's core information technology infrastructure, including data centers, networks, data resources, and so forth, it also provides a wide range of user-support functions, coordinates corporatewide IRM activities, and polices system standards. But at the same time, it promotes user ownership and maintenance of data resources, client self-sufficiency in the exploitation of information tools, and technology planning at the operating unit level.

Figure 1 represents the information service components of the organization as they are dispersed among various operating units. For example, *data processing* is divided between *academic computing* and *administrative computing.* Similarly, IRM functions are to be found everywhere. Clearly this more traditional structure does not afford opportunities arising from the combination of complementary services, such as the library, media, networks, and computer systems.[6]

for, see The Index Group, *Critical Issues of Information Systems Management for 1993* (Boston: The Index Group, 1993). This survey of more than three hundred CIOs is published annually.

[5]I have written extensively on this subject. See Richard M. Kesner, *Microcomputer Applications in Libraries* (Westport, Conn.: Greenwood Press, 1984), 49–80; and *Information Systems: A Strategic Approach to Planning and Implementation* (Chicago: American Library Association, 1988), 1–71. See also F. Warren McFarlan and James L. McKenney, *Corporate Information Systems Management* (Homewood, Ill.: Irwin, 1983).

[6]For two informative anthologies on this subject, see Brian L. Hawkins, ed., *Organizing and Managing Information Resources on Campus* (McKinney, Tex.: Academic Computing Publications, 1989); and Caroline Arms, ed., *Campus Networking Strategies* (Maynard, Mass.: Digital Press, 1988).

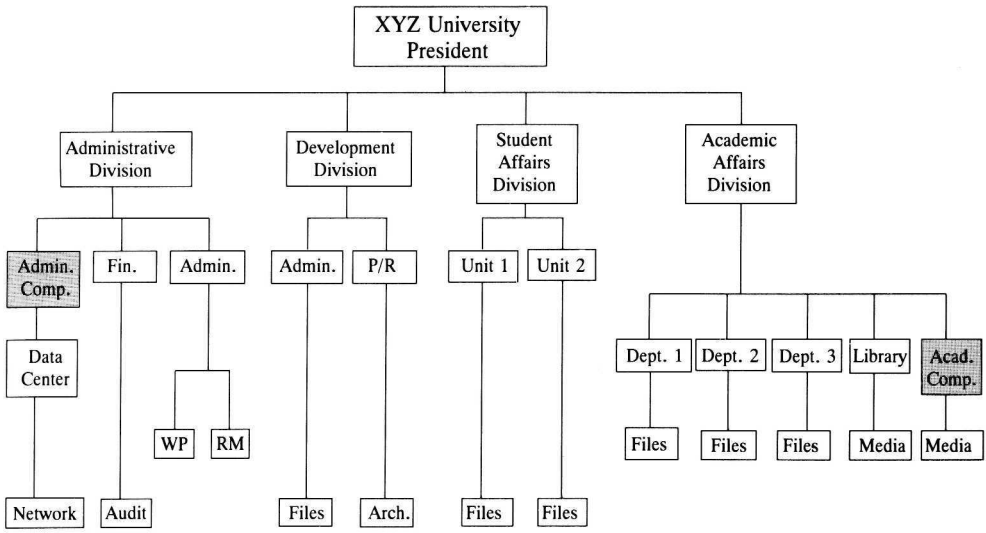

Figure 1. XYZ University: A Typical Organizational Structure (Information Service Components)

In figure 2, services are reorganized to take advantage of the synergies absent from the previous example. At the same time, the structure allows for the streamlining and downsizing of the information technology team, and for an organization's decision to focus its investment in people, hardware, and software where it will have the greatest impact. Furthermore, in this scenario the chief information officer is now a player of senior executive rank, participating in the institution's strategic planning process. Similarly, as the direction of the parent institution changes, the CIO has the advanced warning and flexibility to redirect his or her resources accordingly.

Unfortunately, the appointment of a chief information officer and the reorganization of information services will not in and of themselves lead to the effective use of information services and technologies. Ultimately, the corporate culture of the IRM team must also change. Individually, players must become more flexible and proactive in their approach to their respective assignments. Collectively, they must commit themselves to total quality, which in turn means an acceptance of the team's success over individual recognition.[7] They must also act entrepreneurially, seeking out opportunities to maximize the benefit of their services through the innovative use of new technologies and skillful change management.

This last characteristic is particularly important in an environment in which teamwork will cut across organizational lines, users "own" the data and may also control their own hardware and software, and those in the trenches, not the technologists, are the experts in specific applications. Under these conditions, process management will require the nurturing of alliances, where the common ground is defined by corporate strategic objectives and personal relationships rather than by a rigorous reporting structure. Indeed, we are entering an era in which organizational "authority" is being

[7]David A. Garvin, "Competing on the Eight Dimensions of Quality," *Harvard Business Review* 87 (November-December 1987): 101–09; and Y. S. Chang, George Labovitz, and Victor Rosansky, *Making Quality Work* (New York: Harper Business, 1993).

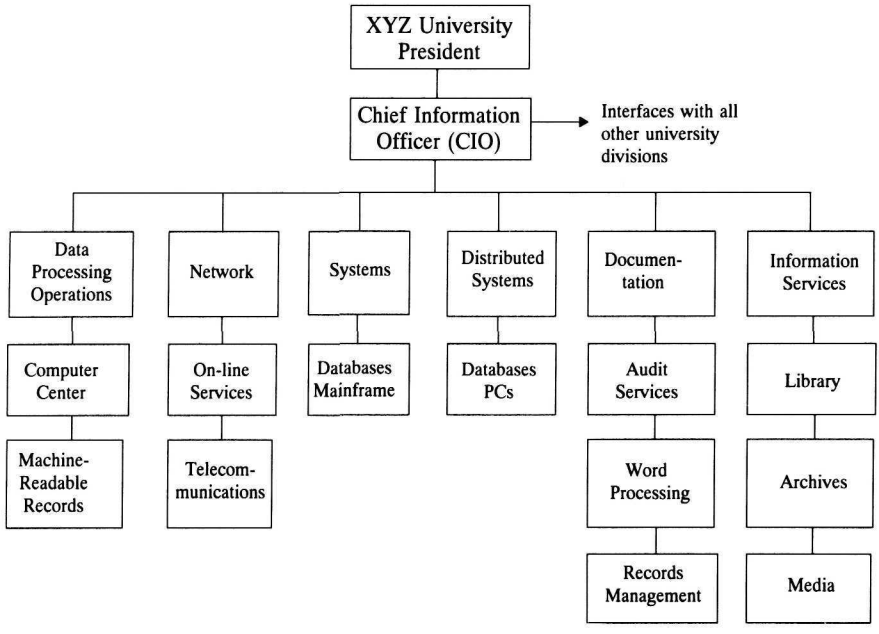

Figure 2. XYZ University Integrated Information Systems and Services Division: The Information Utility Model

replaced by informal, complex, overlapping reciprocal arrangements. In this setting, action steps will emerge from negotiation processes whereby all participants believe they have a stake and therefore all will benefit from a positive outcome. Similarly, the effective manager will be measured in terms of his or her success as a negotiator, facilitator, catalyst, and team builder.[8]

Given this view of the modern organization, it is clear that the archivist must possess a skill base that differs from those of the past. Through formal training today, the typical archivist learns technical skills, such as collection accessioning and processing, preservation, description, and reference services. But the archivist is never trained as a manager (even in the traditional sense of that term). Those who run successful programs have learned their management skills through practical experience and self-training or as the understudies to the rare entrepreneurs of the profession, people like Jerry Ham and Phil Mason.

The time has come to redefine the archival profession's educational goals and objectives. In our efforts to do so, we must define the training requirements and critical success factors for the archivist operating in the information age. I see those as the following:

Management style and leadership. Throughout this essay, I have indicated the process management qualities vital to the success of an information services professional. These include a strategic focus, flexibility in addressing tactical issues, a people-oriented as well as task-oriented project management style, the ability

[8]On the theme of influencing others within a complex organizational structure, nothing compares with Allan R. Cohen and David L. Bradford, *Influence Without Authority* (New York: John Wiley, 1990). See also *Managing for Excellence: The Guide to Developing High Performance in Contemporary Organizations* (New York: Wiley, 1984) by the same authors.

to delegate and manage through others, ruling through consensus, and a team approach to problem solving.

Organization and structure of the information technology function. The archivist will never be effective unless he or she and the information technology group as a whole are appropriately positioned within the larger organization. First and foremost this means that the archives will function within the context of the information utility model and play an integral role in the organization's management of information resources. Organizationally, the core information technology group, reporting to the CIO, should include centralized management information system services (including archives, media, user support, etc.), network management, a standards committee, and a technology review team. IRM applications support could report to the CIO, but it will more likely report to the respective operational heads who employ these systems.[9]

Skill base: individual and team. The archivist need not be a technologist but must be conversant in computer and telecommunications technologies. More importantly, the archivist must have the vision to appreciate the potential uses of emerging information technologies and how they may benefit his or her own operation as well as the enterprise as a whole. The archivist must also have a sufficient knowledge of the organization, its product lines and services, and its functional information requirements.

Total quality project management. The archivist must implement and enforce a total quality program with its focus on excellence in individual and team performance. To complement this effort, the entire culture of the archival organization must become team-oriented, usually implying an overall reduction in reporting levels, flexibility in project assignments, and rotating team leadership. This approach will foster among participants a sense of ownership and commitment that will lead to improved performance results.[10]

The environment. Rather than viewing the environment as an obstacle to success, the archivist should treat it as an ever-expanding reservoir of opportunities. In this context, the archivist should turn to resources outside his or her own organization for guidance and support. For example, the archivist should develop strategic alliances with institutions of higher education, research centers, or professional associations whose interests parallel those of the organization's information technology programs. Instead of relying entirely on home-grown solutions, the archivist might rely more heavily on outsourcing for specific expertise or on the cooperation of hardware and software vendors. Admittedly, there are risks associated with the development and nurturing of these and similar alliances. However, in the long run, such an approach will establish a reliable support network for the organization's IRM functions.

Technology transfer and change implementation. In the area of technology transfer, the archivist needs to become more creative in the exploitation of procedures and systems developed in cognate disciplines. Finally, perhaps the most critical success factor of all, the archivist must become an agent or prophet of change within the organization. The archivist must assist in the evolution of a corporate culture that is receptive to change and a work force that is willing to forego old work habits in light of technological innovations. In this con-

[9]Jerry Kanter and Richard M. Kesner, "The CIO/GIO as Catalyst and Facilitator: Building the Information Utility to Meet Global Challenges," forthcoming in *The Global Issues of Information Technology Management,* edited by Shailendra Palvia, et al. (Harrisburg, Pa.: Idea Group, 1992). See also Charles Wiseman, *Strategic Information Systems* (Homewood, Ill.: Irwin, 1988).

[10]See sources cited in notes 7 and 8.

text, information will be viewed as the lifeblood of the organization and the archivist as part of a highly skilled and dedicated team devoted to its enrichment and support.

An Education Agenda for the Archivist

How then does one proceed from the above list of critical success factors to a strategy for educating the archival profession? Some may observe that the skills and training alluded to in this essay are readily available through a wide range of university, postgraduate, and professional programs. Although this is true, it would require extraordinary effort and vision on the part of the average archivist to chart out a course of action based on these resources. Furthermore, archival practitioners need the appropriate focus, direction, and incentive to derive the full benefit from these more generic course offerings.

This is where the Society of American Archivists and its accreditation body, the Academy of Certified Archivists (ACA), have an important part to play. As a profession, we need to redefine the criteria for archival education so that it encompasses all the skills necessary to render archivists productive members of the information resource management team. Next, the SAA and ACA must provide guidelines and syllabi to assist members in the development of their initial *and ongoing* self-training activities. In this regard, we should survey existing education offerings, a task achieved in part through the publication of *Automated Records and Techniques in Archives: A Resource Directory*[11]; identify gaps in existing curricular offerings; and take steps to fill them. Finally, to inject new meaning and purpose into the archival enterprise, the SAA should continue to publish study materials and texts and to offer training programs and seminars that draw on the latest innovations in information technology.

Where specifically must we focus our attention as a profession on educational objectives? Here is the short list:

- **Strategic planning:** its role in the development and management of the enterprise; how the process is structured and how it works; the nature, use, and importance of its end products; and IRM planning as a subset of the total corporate effort.
- **Organizational dynamics and general management skills:** how to organize the enterprise, "influence without authority," establish and nurture a team process, build alliances and internal and external linkages, create and manage a budgeting process, manage financial and human resources, and how to structure and manage complex projects and processes.
- **Total quality:** what total quality is, why it is important, how to establish a total quality program within the archival enterprise, the role of the quality circle, and how to sustain total quality management over the long haul.
- **Technology innovation and transfer:** what is going on in information technology today, what the new products and services are, how they are affecting information resource management, what the issues concerning the implementation and effective deployment of new technologies are, and how these developments may apply to the management of the archival enterprise.
- **Professional standards and definitions:** what it means to be an archivist in the context of information

[11]Marion Matters, ed., *Automated Records and Techniques in Archives: A Resource Directory* (Chicago: Society of American Archivists, 1990). The National Historical Publications and Records Commission has also issued a grant to the Society of American Archivists to develop a curriculum for its members in the areas of automated records and techniques. The approach taken by the project team embraces many of the strategies recommended in this essay.

> resource management, whether the training curriculum and standards currently in place are rigorous enough to meet the challenges of the emerging information technology environment and the dynamics of the modern corporation, and what the responsibilities of the individual practitioner and the profession are in this regard.

If accreditation is to be meaningful, the profession must come to grips with the fact that our current view of archival training-course content is much too narrow. Indeed, I have repeatedly argued that these programs as traditionally defined are becoming increasingly irrelevant.[12] On the other hand, we need not reinvent the wheel. Let us design a comprehensive curriculum that includes both generic management skills and more focused, IRM-related content.

Having established these new standards, we should then devise various scenarios for how students in archival administration training programs *and* practitioners in the field can best exploit available local resources to supplement their educations as archivists. In addition, the SAA, the ACA, the Committee on Automated Records and Techniques, or some other appropriate body must create guidelines, study materials, case books, referral and consulting services, and continuing education opportunities to supplement the formal training process. Finally, through accreditation or some other form of peer review, the SAA should establish an enforcement mechanism to drive home the necessity of this professional development effort.

Progress to date has been slow and largely unsatisfying. From the perspective of this author, the ground continues to slip away from under the feet of archivists as more of their responsibilities are turned over to other information services professionals. Perhaps this is all for the best. However, if the archival process is to retain its integrity and importance as a key long-term aspect of information resource management, it must blend the traditional values as imparted through current educational practices with a knowledge of how information technology is transforming the landscape. Who will do this? When will they start? What will the transformed educational and professional development process look like when the process is all over? Through SAA's current research efforts, funded by the National Historical Publications and Records Commission, the Society is seeking answers to these very questions.[13] I wish them Godspeed.

[12]See Richard M. Kesner, "Automated Information Management: Is There a Role for the Archivist in the Office of the Future," *Archivaria* 19 (1984–85): 162–72; "Whither Archivy? Some Personal Observations Addressed to Those Who Would Fiddle While Rome Burns," *Archivaria* 20 (1985): 142–48; and *Information Systems: A Strategic Approach to Planning and Implementation* (Chicago: American Library Association, 1988), 1–13.

[13]The NHPRC has generously provided seed funding for a consideration of the areas of automated records and techniques as these relate to archival education. As part of this process, a "skunk works" team of technologists, archival educators, archival practitioners, and curriculum developers get together to define a curriculum and to discuss next steps. Out of this endeavor will emerge the specifications for a training program and related implementation strategies.