NHPRC RECOMMENDS 47 GRANTS TOTALING UP TO $3,801,809

Chairperson John W. Carlin, flanked by Deputy Chairperson Alfred Goldberg and Executive Director Ann C. Newhall, conducts the November Commission meeting. Photograph by Earl McDonald, NARA.

The National Historical Publications and Records Commission (NHPRC) met on November 14, 2000, and recommended grants totaling up to $3,801,809 for 47 projects to preserve, publish, and encourage the use of documentary sources relating to the history of the United States. Archivist of the United States and NHPRC Chairman John W. Carlin expressed satisfaction with recent legislation, passed by the Congress and signed by the President, re-authorizing annual appropriations for the NHPRC's grant program through FY 2005 at a maximum funding level of $10 million.

The Commission based its actions on an estimated funding level of $6 million. This is the level of funding provided in the recently vetoed Treasury/Postal Appropriations Bill for FY 2001 and provided in the previous 2 fiscal years. All funding recommendations made at this meeting are contingent on the availability of appropriated funds for FY 2001.

Competition for funding was fierce: requests under consideration at this meeting alone exceeded $8 million. While reaffirming its support for the Founding-Era documentary editions, the Commission took note of a substantial increase in the number and quality of grant proposals in the State Board and Electronic Records Programs. Of particular interest was the marked increase in the amount of state funds committed to match NHPRC regrant recommendations: a total of $913,000. Six of the proposals in the electronic records category were in response to the Commission's November 1999 call for proposals to broaden the base and raise the level of archival expertise in the area of electronic records throughout the nation.

At this first meeting of the Federal fiscal year, the NHPRC considers projects addressing its three equal strategic goals: to support the eight Founding-Era documentary editing projects; to partner with the states in jointly funded programs to strengthen the nation's archival infrastructure and to expand the range of records that are protected and accessible; and to provide leadership in funding research-and-development on appraising, preserving, disseminating, and providing access to important documentary sources in electronic form.

The Commission remained strongly committed to all three of its strategic goals. After much discussion, the members were able to maintain last year's level of funding for the Founding-Era documentary editing projects, without further diminishing the amounts awarded in the other two areas. However, the two successful NHPRC Fellowship Programs, in Archival Administration and in Documentary Editing, will be suspended for the period 2001–02, because of the NHPRC's budget dilemma.

The Commission recommended 8 grants for Founding-Era documentary editing projects totaling $1,295,714; a total of $985,383 for regrant projects in 7 states; 13 administrative support grants to State Historical Records Advisory Boards totaling $143,494; and 9 grants totaling $1,200,000 for electronic records projects. A grant of $71,123 to the American Association for State and Local History, in partnership with the Council of State Historical Records Coordinators, will help implement key elements of the National Forum on Archival Continuing Education's action agenda. The Commission also recommended 8 subvention grants for historical documentary editions totaling $75,493 and a grant of $30,602 to support the 2001 Institute for the Editing of Historical Documents.

The complete list of funded projects appears at the end of this article.

The Commission unanimously approved a number of resolutions:

- Endorsing staff initiatives to begin collecting information and input from the Commission's constituent groups as a prerequisite to the next formal review of the strategic plan.
- Outlining the process for applicants in all areas to apply for endorsement (as opposed to funding) of projects, to be included in the NHPRC Grant Guidelines.
- While taking note of the inability of current funding to meet the needs of NHPRC constituents, encouraging staff efforts to explore ways in which the NHPRC can encourage urgently needed efforts to focus on the records of under-documented groups in American society, including Native Americans, Asian Americans, Hispanic Americans, African Americans, and other groups whom the historical establish- *(continued on page 10)*

FROM THE EDITOR

With the end of another calendar year, the NHPRC continues to carry out its commitment to identifying, preserving, and increasing access to the American documentary record. On November 1, President Clinton signed into law a bill reauthorizing the Commission to receive Federal appropriations for competitive grants up to $10 million per year for fiscal years 2002 through 2005. There is much good work remaining for the Commission to do, and it is reassuring to have the mechanism in place to enable it to do so.

This December 2000 issue opens with a report on the November Commission meeting. At this first meeting of the fiscal year, the Commission considers proposals relating to its three equal strategic goals: Founding Fathers documentary editions, state board projects, and electronic records projects. This year was notable for surges both in the quality of grant proposals presented for consideration and in the dollar amounts requested. Meeting the pressing needs of grant applicants at this time required sacrifice. Because requests greatly exceeded appropriated funds, the Commission recommended that the annual NHPRC fellowships in archival administration and in historical documentary editing be suspended and the funds normally set aside for these programs be used instead to maintain the Founding Fathers documentary editions at last year's level of support.

Of the NHPRC's three equal strategic goals, perhaps the least widely understood is its support for research and development regarding solutions for the archival problems posed by electronic records. This issue of *Annotation* is devoted to some of the NHPRC's outstanding recent electronic records projects, including two projects that may prove to rank among the most significant actions ever taken by the NHPRC: namely, its support for the InterPARES project and the NHPRC-funded project undertaken by the San Diego Supercomputer Center.

Anne Gilliland-Swetland and Philip Eppard write about the InterPARES Project. InterPARES (International Research on Permanent Authentic Records in Electronic Systems) is a 3-year, multinational research project for which the Commission is funding participation by the non-Federal component of the U.S. team. Basically, this project is working to develop the knowledge that is needed to permanently preserve electronically created records and to ensure that they remain usable and trustworthy over long periods of time.

Amarnath Gupta, Bertram Ludaescher, and Richard Marciano, researchers at the San Diego Supercomputer Center (SDSC) at the University of California, San Diego, describe the NHPRC project, which is aimed at determining the scalability for smaller institutions of the solutions SDSC is developing for the long-term preservation of, and access to, software-dependent data objects.

Robert Horton reports on the Trustworthy Information Systems Project, the significant project of the State Archives Department of the Minnesota Historical Society.

Elaine D. Engst and Cheryl Stadel-Bevans write about the Cornell University Electronic Records Project, which investigated the requirements for electronic administrative records in a university setting.

Stephanie Simon of the Center for Technology in Government (CTG) at the State University of New York, University at Albany, describes CTG's recent project, funded in part by the NHPRC, to examine how public and private sector organizations acquire, save, maintain, and retrieve electronic business records for primary and secondary uses.

Philip Bantin explores lessons learned from the Indiana University Electronic Records Project regarding strategies for managing electronic records.

Happy New Year, everyone!

"The Mouse That Roared"

Wonderful news! Following unanimous passage in both the House of Representatives and the Senate, President Clinton has signed Public Law 106-411, which authorizes the NHPRC to receive Federal appropriations of up to $10 million per year through Fiscal Year 2005.

Among the many people who helped make the NHPRC's reauthorization a reality are:

- The bill's sponsor, Rep. Steve Horn.
- The 11 cosponsors (in alphabetical order): Rep (and Commission member) Roy D. Blunt, Rep. Benjamin A. Gilman, Rep. Tom Lantos, Rep. Carolyn B. Maloney, Rep. John McHugh, Rep. Constance A. Morella, Rep. Major R. Owens, Rep. David E. Price, Rep. Jim Turner, Rep. Greg Walden, and Rep. Henry A. Waxman.
- Those who testified before the House Subcommittee on Government Management, Information, and Technology at the hearing on NHPRC's reauthorization: Rep. Roy Blunt, Commission Chair (and Archivist of the United States) John W. Carlin, UCLA Associate Professor (and NHPRC grantee) Dr. Anne Gilliland-Swetland, and Commission member (and Newberry Library President) Dr. Charles T. Cullen. Witnesses' testimonies are available at *www.house.gov/reform/gmit/hearings/2000hearings/000404.nara/000404b.htm*
- The Senate Committee on Governmental Affairs; its chairman, Senator Fred Thompson, and its ranking member, Senator Joe Lieberman.
- The committee staffs, particularly Heather Bailey on the House side and Susan Marshall and Peter Ludgin on the Senate side.
- NARA's Director of Congressional and Public Affairs, John Constance.
- And all the state coordinators, documentary editors, archivists, historians, leaders of universities and professional organizations, teachers, students, and people who revere this nation's history who wrote, called and buttonholed Senators and Congressmen to tell them how important it was to pass this legislation.

Perhaps my favorite moment during the entire reauthorization process occurred during the House committee markup of the bill, when Rep. Jim Turner, referring to the NHPRC's minuscule budget and disproportionately large impact, said that the NHPRC is "truly the mouse that roared!"

Now, we press on with our important work. This issue of *Annotation* is devoted to projects reflecting one of the NHPRC's three equal strategic goals within its broader mission, and one in which the word "mouse" has a different meaning entirely: electronic records. Without question, the greatest challenges facing archivists today are how to identify, preserve, and provide long-term access to authentic electronic records. Archivists in all kinds of institutions and in governments at all levels report that they are having to cope with electronic records of staggering importance and in overwhelming quantities, and that they are doing so with the handicap of having to operate in largely unknown territory.

Why should you care about this? Because more and more of the records of our time, of your legal entitlements as citizens, your financial transactions, your correspondence, your family's memories, even your very existence are being created and maintained via systems that are dependent upon some sort of software in order to access them. Because this software—and the hardware that it operates on—will become obsolete in just a few years. And because the process of 'migrating' information from one system to another can degrade the information to the point of changing its meaning altogether.

The NHPRC recognized nearly a decade ago that the history of our time would be based, to a great extent, upon materials created with computers, rather than with typewriters or pens, and that our history could only be written if the raw primary materials survive, remain authentic, and are easy to access. As a consequence, the NHPRC has been at the forefront in supporting archival electronic records research and development. The Commission has elected to devote its funding to projects involving records originally created in electronic form. At this time, we do not have sufficient funding to support projects that primarily involve digitization activities (i.e., the conversion to electronic form of documents originally created in paper form).

The Commission has had a remarkable impact on this work, especially given the limited funds the NHPRC has been able to provide. During the reauthorization hearing that I mentioned earlier, Dr. Anne Gilliland-Swetland asserted that "the National Historical Publications and Records Commission is the only national funding agency that is directly addressing [electronic records] issues such as identification of records ... evidential requirements ... technological dependency ... trustworthiness ... public access ... expertise ..." She went on to say that "the Commission has single-handedly been responsible for most of the knowledge gains and development activities that have occurred in this area in the past decade."

At its November 1999 meeting, the NHPRC voted to expand this strategic initiative by issuing a call for proposals to address the need to broaden the base and increase the level of archival expertise in the area of electronic records. This call for proposals is in response to the recognized needs to increase the number of archivists who are equipped to work with electronic records, and to increase the basic knowledge of archivists and related professionals about the challenges and opportunities information technology poses and the initiatives currently attempting to address them. To support this initiative, the Commission has allocated up to $600,000 of its annual appropriated grant funds for 3 years. At its November 2000 meeting, the Commission awarded its first six grants under this initiative.

The next deadline for applications for electronic records grants is June 1, 2001. Potential applicants are encouraged to contact the Commission's Director for Technology Initiatives, Mark Conrad, early in the process of planning the project and preparing the proposal. He can be reached at 202-501-5600, ext. 233, or via email at *mark.conrad@arch1.nara.gov.*

NHPRC Application Deadlines

THE COMMISSION'S MEETINGS FOLLOW THE FISCAL YEAR OF OCTOBER 1 TO SEPTEMBER 30. CONSEQUENTLY, THE FIRST MEETING OF THE FISCAL YEAR IS IN NOVEMBER AND THE SECOND IS IN MAY.

June 1 *(for the November meeting)*

Proposals addressing the following top priorities:

- The NHPRC will provide the American public with widespread access to the papers of the founders of our democratic republic and its institutions by ensuring the timely completion of eight projects now in progress to publish the papers of George Washington, John Adams, Benjamin Franklin, Thomas Jefferson, James Madison, and papers that document the Ratification of the Constitution, the First Federal Congress, and the early Supreme Court
- The NHPRC will promote broad public participation in historical documentation by collaborating with State Historical Records Advisory Boards to plan and carry out jointly funded programs to strengthen the nation's archival infrastructure and expand the range of records that are protected and accessible
- The NHPRC will enable the nation's archivists, records managers, and documentary editors to overcome the obstacles and take advantage of the opportunities posed by electronic technologies by continuing to provide leadership in funding research and development on appraising, preserving, disseminating, and providing access to important documentary sources in electronic form

OCTOBER 1 *(for the May meeting)*

Proposals not addressing the above priorities, but focusing on an activity authorized in the NHPRC statute as follows:

- collecting, describing, preserving, compiling, and publishing (including microfilming and other forms of reproduction) of documentary sources significant to the history of the United States
- conducting institutes, training and educational courses, and fellowships related to the activities of the Commission
- disseminating information about documentary sources through guides, directories, and other technical publications
- or, more specifically, documentary editing and publishing; archival preservation and processing of records for access; developing or updating descriptive systems; creation and development of archival and records management programs; development of standards, tools, and techniques to advance the work of archivists, records managers, and documentary editors; and promotion of the use of records by teachers, students, and the public

APPLICATION GUIDELINES AND FORMS MAY BE REQUESTED FROM NHPRC, NATIONAL ARCHIVES AND RECORDS ADMINISTRATION, 700 PENNSYLVANIA AVENUE NW, ROOM 111, WASHINGTON, DC 20408-0001, 202-501-5610 (VOICE), 202-501-5601 (FAX), *nhprc@arch1.nara.gov* (E-MAIL), OR BY ACCESSING OUR WEB SITE AT *www.nara.gov/nhprc/*

RECENT PUBLICATIONS VOLUMES
NOVEMBER 2000

The following products from NHPRC-supported documentary editing projects have been received in the Commission office since April 2000.

The Papers of Ulysses S. Grant, Vol. 23 [February 1–December 31, 1872] (Southern Illinois University Press, 2000)

The Papers of Ulysses S. Grant, Vol. 24 [1873] (Southern Illinois University Press, 2000)

The Papers of General Nathanael Greene, Vol. 11 [April 7–September 30, 1782] (University of North Carolina Press, 2000)

The Papers of Martin Luther King, Jr. Vol. 4: *Symbol of the Movement* [January 1957–December 1958] (University of California Press, 2000)

The Papers of Henry Laurens, Vol. 15 [December 1778–August 31, 1782] (University of South Carolina Press, 2000)

The Selected Papers of Elizabeth Cady Stanton and Susan B. Anthony, Vol. 2: *Against An Aristocracy of Sex, 1866 to 1873* (Rutgers University Press, 2000)

The Papers of George Washington: Presidential Series, Vol. 9 [September 1791–February 1792] (University Press of Virginia, 2000)

ARE YOUR RECORDS TRUSTWORTHY?

BY ROBERT HORTON

Mary Klauda and Shawn Rounds, principal authors of the trustworthy information systems handbook, pose in front of a Univac II computer console (c. 1955, manufactured in St. Paul, MN). The computer console is now in the Minnesota Historical Society's museum. Photograph courtesy of the Minnesota Historical Society.

According to all the travel brochures and web sites, Minnesota is the land of sub-zero winters, the Mall of America, Paul Bunyan, and 10,000 lakes. It is also the home of some 4,000 units of government, most of which are hell bent on using information technology in some form or other in their work. The consequences for recordkeeping may not be as fierce as the climate nor as mind numbing as the Mall, but they will probably, in the end, take some mythic figure to resolve. In the meantime, dealing with electronic records is the job of the State Archives Department of the Minnesota Historical Society.

Along with many other archival organizations, the State Archives first began to venture into this brave new world of recordkeeping during the 1990s. Our work can be characterized by close collaboration with our government constituents, the development of practical tools, and an emphasis on education. The result is a product and an approach, based on the concept of a trustworthy information system, that together begin to redefine the State Archives' role.

As background, and in gratitude, it is important to note that the National Historical Publications and Records Commission provided significant and valuable support to several phases of this effort. This first took the form of a grant to develop a strategic plan, which was completed in 1996. The plan sketched the framework in which the State Archives had to work:

No longer can appraisal of information for long-term significance wait until the records creator declares the information or records inactive. No longer can a single archives facility realistically expect to retain physical control of and provide intellectual access to all historically significant records and information created by government. Given the overall environment of decentralization and information expansion, success in the future will depend on developing partnerships with records creators and building a constituency for the preservation of historical records.

Working from this, the State Archives applied for and received a grant from the NHPRC to establish an electronic records program in Minnesota. Work began on the project in January 1998, and the first version of the trustworthy information systems handbook was published on the Web in January 2000 *(www.mnhs.org/preserve/records/tis/tis.html).*

The principles behind the project were derived directly from the strategic plan. The staff at the State Archives began with the assumption that they could not do it all; the challenges presented by electronic records, combined with the quantity and complexity of the electronic recordkeeping systems in government, meant that agencies had to become active, willing collaborators in any electronic records management scheme. A compelling argument for that collaboration had to include two elements: 1) an ongoing educational process whereby archivists and Information Technology (IT) staff routinely communicated with and learned from each other and 2) a product or resource that agencies could use to implement what we all learned. These were the tools to turn theory into practice.

Education was critical. We had to learn how to speak to systems designers and administrators; they had to learn just what we could offer. In part, this was a matter of increasing opportunities to meet with them. To do that, we sponsored groups to address specific issues, such as metadata, XML, and data warehousing; we hosted workshops and presentations; and we went diligently to committee after committee. The overall goal of our efforts was to establish a mutually beneficial community where an ongoing collaboration and exchange of information was the routine. To the extent we could master some particular areas of expertise, we could become useful consultants; at the very least, though, we could facilitate the necessary and inevitable efforts to keep up with the various trends and developments in information technology. In the process, we would become better placed to evaluate and, ultimately, to effect the options for practically managing the challenge of electronic records. Simultaneously, our partners in government would become more familiar with our mission. We would, in short, translate archival principles into terms that our partners in government could understand and support.

The best proof of our bona fides was a particular product: the trustworthy information systems handbook. The handbook was inspired by continuing questions about the legal and statutory framework for electronic records and electronic government. Increasingly, to justify the costs and legitimate the scope of projects, technology had to connect explicitly with policy. Legislators were asking questions about the value of IT; citizens were asking about data privacy; and agencies were asking about new laws on topics like electronic signatures, uniform electronic transactions, and data administration.

As we explored these questions, a number of principles emerged. First, the emphasis is on the record creating and keeping system, not on the records themselves. This is no chicken-and-egg problem: in terms of design, administration, and analysis, the system had priority because that is how agencies conceive of technology implementa-

tions. Second, all systems are not created equal. The practices and level of care appropriate for one are probably too much or too little for any other. Agencies need the latitude to calculate the pertinence of any standard to their needs. Third, agencies' calculations turn on practical considerations, such as operational needs, system security, risk analysis, and statutory mandates. These are best addressed in the system design phase. Fourth, the methodology could take the form of a series of questions that all agencies answer. The answers of any one agency might be different from that of another, but they could still reach a critical mass that constitutes some "family resemblance" of trustworthiness. Fifth, and perhaps most significant, archival concerns can only be met within this broader framework. Whatever the role chosen by an archives, its concerns and practices have to fit into the larger picture of routine system administration and design.

In collaboration with partners from state and local government, we worked out these considerations in the analysis of particular systems, sets of criteria, and practical methodologies. The result was the trustworthy information systems handbook. This includes an introduction, explaining the concept; the definition and classification of criteria that comprise trustworthiness; a primer on the legal and policy framework for managing electronic records; and five case studies describing the application of the criteria to the design and analysis of actual systems. Altogether, this explains the "what, why, and how" behind the idea of trustworthiness.

We decided on a Web-based product for a number of reasons. Not only did that seem the appropriate choice for the topic, but it also gave us the potential to revise the handbook and to develop additional components as necessary. Also, since virtually all of our constituents had access to the Internet, a digital handbook offered the greatest potential for distribution. The end result has been surprisingly successful, with the surprise generated only by the persistently high level of interest our constituents in government show in the handbook. Since its publication in January, users have downloaded an average of roughly 150 copies of the handbook in Portable Document Format (PDF) format each month. People are reading it; more importantly, they are applying it, calling us for more information, and working it into their own methodologies.

In the process of developing the handbook and applying it in practice, the State Archives gained a greater understanding of its potential role in managing electronic records. These insights inform our plans for the future. The effort certainly underscored

the sense of limitation struck in the strategic plan. The labor-intensive nature of systems design and documentation makes it clear that we cannot actively engage in planning for any but the most significant projects. Records creators have to contribute. To do that, they will need practical tools, of which the trustworthy information systems handbook is one.

Metadata and XML are two more potential tools. As is well known, metadata is important because standard documentation will facilitate the sharing of information and practices. With the help of an ad hoc committee and the META Group, we are now exploring the various types and levels of metadata, paying particular attention to the Australian recordkeeping metadata standard. XML has perhaps been too generously described as a magic bullet, but its potential for, among other things, freeing information from applications while documenting its structure has enormous appeal. That can facilitate the data sharing and re-use that optimizes investments in information technology; it can also facilitate the migration and conversion of electronic records over the long term. In addition, its pertinence to data warehousing makes XML one of the most significant applications records creators are devising for housing and using digital information.

The State Archives is working in all these areas. The starting point and the basis for our electronic records program is the trustworthy information systems handbook. We continue to support and revise it. The second version was launched in August 2000, notably supplemented by a section on risk analysis and a tool for determining legal risk. The handbook's success with our constituents directs our work, involving us in the development of selected, critical systems and buttressing our educational role in the development of others. While we have many more questions to answer and decisions to make about our program, this project has given our efforts a practical framework. It supports the credible, effective partnerships with government that we need to move forward.

The project director for the development of the trustworthy information systems handbook was the late Lila Goff, assistant director for Library and Archives at the Minnesota Historical Society. The principal authors of the handbook were Mary Klauda and Shawn Rounds. The web site is the work of Angela Goertz and Jennifer Johnson.

ROBERT HORTON IS THE STATE ARCHIVIST OF MINNESOTA.

Roy C. Turnbaugh Joins Commission

The National Association of Government Archives and Records Administrators (NAGARA) has named Roy C. Turnbaugh, State Archivist of Oregon, to be its representative on the National Historical Publications and Records Commission. He succeeds former Delaware State Archivist and Records Administrator Howard Lowell, who accepted a position with the National Archives and Records Administration.

Dr. Turnbaugh has held his current position since 1985, and previously was employed by the Illinois State Archives. He is the immediate past president of NAGARA. Dr. Turnbaugh received the Society of American Archivists' C.F.W. Coker Prize in 1984 and the SAA Fellows' Ernst Posner Prize in 1999.

A graduate of Aurora College, he received his master's and doctoral degrees in history from the University of Illinois at Urbana-Champaign. His dissertation explored the career of American educator and sociologist Harry Elmer Barnes. Dr. Turnbaugh is the author of *Echoes of Oregon, 1837–1859* (1987) and *A Guide to County Records in the Illinois Regional Archives* (1983), as well as a number of articles on archival and historical subjects.

Preserving Authentic Electronic Records: The InterPARES Project

By Anne Gilliland-Swetland and Philip Eppard

In the introduction to his first book, *History of the Latin and Teutonic Nations* (1824), the German historian Leopold von Ranke made the famous statement that his history "seeks only to show what actually happened." Ranke launched a revolution in historiography by asserting the primacy of documentary research in archives to determine the facts about the past. His assumption was that using original archival records and manuscripts rather than secondary sources would increase the authoritativeness of historical writings.

Working with primary sources, however, requires that the scholarly community be able first to establish and corroborate the provenance, authority, and version of the texts with which they are working. While today's digital texts provide exciting opportunities to enhance scholarship because they can be made easily accessible online and can be searchable and easily manipulated, scholars and the archivists responsible for preserving these sources increasingly must contend with the intellectual ambiguity of records that are electronically created and maintained. It is difficult, using existing professional and scholarly methods, to establish the authorship, attribution, and versions of materials such as electronic drafts of documents or databases because the nature of the medium is so mutable. Furthermore, the inherent characteristics of increasingly prevalent electronic media forms make it no longer viable to consider preserving most such records in non-electronic form, since to do so would result in the loss of critical information as well as an equally critical loss of evidential value.

Ensuring the long-term preservation, trustworthiness, and accessibility of the nation's electronic records is a challenge that the National Historical Publications and Records Commission has been seeking to address for the past decade. The largest project that the Commission has supported in this endeavor to date is the InterPARES Project. InterPARES (International Research

InterPARES American research team members Ken Thibodeau, Sharon Farb, Anne Gilliland-Swetland, and Philip Eppard discuss matters at the project's Rome meeting. Photograph courtesy of Philip Eppard.

on Permanent Authentic Records in Electronic Systems) is a 3-year, multi-national research effort involving countries in North America, Europe, Asia, and Australia. Industry is represented in the research project through the participation of the Collaborative Electronic Notebook Systems Association (CENSA). The broad goal of the InterPARES Project is to develop the theoretical and methodological knowledge essential for the permanent preservation of records generated electronically and, on the basis of this knowledge, to formulate model policies, strategies, and standards capable of ensuring their preservation for use by archivists and other communities who need to retain and use trustworthy electronic records over indefinite periods of time.

The Commission has funded the non-Federal component of the American research team participating in InterPARES. The team includes researchers drawn from archival science, preservation management, library and information science, computer science, and electrical engineering, from the University at Albany, State University of New York; the University of California, Los Angeles; the Georgia Institute of Technology; the University of Missouri, Columbia; and Pennsylvania State University. The academic researchers are joined by representatives from the National Archives and Records Administration and the Smithsonian Institution. In addition to funding from the NHPRC, major funding contributions to the project as a whole have been made by the Social Sciences and Humanities Research

Council of Canada, the National Archives and Records Administration of the United States, and the Italian National Research Council. Other national archival institutions and universities in participating countries have also committed financial and research resources to the project. The international research team is under the general direction of Luciana Duranti, and the headquarters for the international project are located at the School of Library, Archives and Information Studies at the University of British Columbia.

While such models for conducting research are now commonplace in some other disciplines, InterPARES is the first example of a collaborative, multi-funded, multidisciplinary project emanating out of the archival community. The interest of so many governments, sectors, disciplinary domains, and archival institutions underscores both the ubiquity and the intractability of the challenges posed for the long-term management of valuable records that have been created and are maintained in electronic form.

The work of the project has been broken down into four research domains: I. Conceptual Requirements for Preserving Authentic Electronic Records; II. Appraisal Criteria and Methodology for Authentic Electronic Records; III. Methodologies for Preserving Authentic Electronic Records; and IV. Frameworks for Developing Policies, Strategies and Standards. Much of the research is being carried out by four task forces, corresponding to the four research domains. Several products have already been developed, and others are under development. These include requirements for establishing and preserving the authenticity of records in electronic systems; models of appraisal and preservation activities; a survey of institutions that are preserving electronic records or are involved in research in digital preservation; and a glossary of terms that are key to the findings of the research. The glossary will ultimately be

multilingual, and will also take account of variations in usage between different national and professional communities. While the glossary supports a full understanding of the products of the research, it is hoped that it will be useful to the broad archives, preservation, and digital library communities.

As part of Domain I., the project is in the process of conducting and analyzing extremely detailed case studies of electronic records systems of diverse types in a range of organizations. Many of these systems bear little resemblance to traditional forms of records (for example, complex databases, geographic information systems, laboratory records, and interactive web sites). From this analysis, we are deriving an understanding of the nature of the electronic record and of the extent to which its intellectual, if not its physical form, remains the same as that of traditional records. We are also building a typology of elements within different kinds of records that are crucial to the establishment and maintenance of the authenticity of that record while it is still current and when it becomes historical. This typology will then become the basis of the technical and policy requirements for preservation management systems and strategies.

Domains II and III are using modeling techniques to describe the components of the appraisal and preservation processes and also to analyze different methods and strategies currently in place or being developed in archival institutions. Domain IV is distilling the results of the work conducted in the other domains and addressing the policy and standards implications of these within different national and sector contexts.

The case studies have been conducted within government agencies of the United States, Canada, Italy, and the Netherlands; as well as at universities in the United States, Canada, and the United Kingdom; and in corporate settings in Italy. It is possible to compare similar types of recordkeeping systems that exist in different jurisdictions across the case studies, as, for example, in registry systems, student record systems, and Federal patent and trademark systems.

The work within Domains II and III will help introduce modeling methodology to the archival community. The task forces for these two domains have developed models that decompose values and functions of specific activities associated with archival appraisal and preservation. These models are currently being refined and reconciled with each other. What does a model do and how does it help archivists and systems designers? The fundamental role of modeling in the project is that it helps clarify the thinking of the research team. It ensures that concepts and activities and the relationships between them are defined precisely and consistently. The conceptual integrity and precision that modeling can give to the InterPARES research will also make it easier for systems designers to translate the models into working system. The preservation modeling is being informed by the results of an InterPARES survey of institutions that are preserving electronic records or are involved in research in digital preservation.

Members of the American research team have been actively disseminating information about the project and its work at meetings of the Society of American Archivists and meetings of several regional archival associations, but also at the conferences of other organizations, such as the American Society for Information Science and Technology. Many more presentations will be made and more products of the research will be released as the project moves into its final year. Further information about InterPARES is available at the project's web site, *www.interpares.org*, and at the web site for the American team, *www.gseis.is.ucla.edu/us-interpares*. The American team's web site also includes a comprehensive bibliography of the many publications, reports, and web sites of the other electronic records research projects funded by the National Historical Publications and Records Commission.

The dimensions of InterPARES are broad, but the challenges facing the long-term preservation of authentic electronic records are great. When future historians and other researchers seek to follow in Ranke's footsteps and "let the sources speak for themselves," the results of the InterPARES Project will help guarantee that they can do so with some level of confidence that the electronic records they are consulting are in fact the authentic and reliable sources required for their research.

ANNE GILLILAND-SWETLAND IS AN ASSISTANT PROFESSOR IN THE DEPARTMENT OF INFORMATION STUDIES AT THE UNIVERSITY OF CALIFORNIA AT LOS ANGELES. PHILIP EPPARD IS THE DEAN OF THE SCHOOL OF INFORMATION SCIENCE AND POLICY AT THE UNIVERSITY AT ALBANY, STATE UNIVERSITY OF NEW YORK.

Fynnette Eaton Joins Commission

The Society of American Archivists (SAA) has named Fynnette Eaton, Director of the Technical Services Division and Senior Electronic Records Specialist at the Smithsonian Institution Archives, to be its representative on the National Historical Publications and Records Commission. She succeeds Anne R. Kenney, Associate Director of the Department of Preservation, Cornell University Library, and Director of Programs, Council on Library and Information Resources (CLIR), in that capacity.

Ms. Eaton received a B.A. in history and an M.A. in English history from the University of Maryland. She began her archival career with the Archives of American Art, Smithsonian Institution, and subsequently took a position with the National Archives and Records Administration. Since 1986, when she joined NARA's Machine Readable Branch, Ms. Eaton has specialized in electronic records. As part of her work with NARA's Center for Electronic Records, she received the Interagency Committee on Information Resources Management's 1996 Technology Excellence Award for redesigning and implementing NARA's Archival Preservation System.

Ms. Eaton has been active in both the Mid-Atlantic Regional Archives Conference (MARAC), where she served on the Steering Committee and as Chair; and the Society of American Archivists, serving on several program committees, the editorial board for case studies in the management of electronic records, and the SAA Council. She was named a Fellow of SAA in 1995.

The Cornell University Electronic Records Project

BY ELAINE D. ENGST AND CHERYL STADEL-BEVANS

Cornell University Electronic Records Project participants included Assistant Vice President and University Registrar David Yeh, University Records Manager Eileen Keating, and University Archivist Elaine Engst. Photograph courtesy of Elaine Engst.

In the spring of 1998, the Cornell University Archives received a grant from the NHPRC for an 18-month project to investigate the requirements for maintenance of electronic administrative records. At the time of the submission of the grant application, the University had initiated a new endeavor, called Project 2000 or P2K, to make essential changes in the way that Cornell operates.

Project 2000 had two original goals: to replace obsolete administrative software systems and to reengineer business processes. Key to the project was the installation of a new, centralized administrative computer system. Cornell intended to design an integrated system for the five core university functions of human resources and payroll, academic and student services, financial operations, sponsored programs, and alumni affairs and development using PeopleSoft software.

As Cornell University worked towards implementing P2K, the staff of the University Archives decided that this was an appropriate time to begin to address electronic recordkeeping concerns with university administrators. It has frequently been suggested that archivists should be involved from the beginning in systems implementation, and it was to that end that the Cornell Archives staff submitted their NHPRC grant proposal.

The focus of the project was to conduct research into the needs of electronic recordkeeping. The goals of the Electronic Records Project (ERP) included

1. Surveying current practices in the production, retention, and long-term preservation of electronic records scheduled for permanent retention in 2 of the 13 colleges at the University.
2. Analyzing the degree to which information in the college records series were replicated in current central systems and identifying where this information was maintained.
3. Determining the relationships of college records systems with the new system so that recommendations could be made regarding system implementation.
4. Developing recommendations for incorporating the University's records retention schedule into the new administrative system.
5. Creating a plan and making recommendations to the University's central administration for records administration and archival retention of records and data in the new central system.
6. Raising awareness about electronic records issues across campus.

Cheryl Stadel-Bevans was hired as the project archivist. She had recently graduated from the archival education program at UCLA, with coursework in electronic records management and some internship experience. Other Cornell staff included Oliver Habicht, a systems analyst with substantial experience in Cornell systems administration, but no records management background; University Records Manager Eileen Keating; Elaine Engst, Director of the Division of Rare and Manuscript Collections and University Archivist, who served as project director; and Peter Hirtle, Director of the Cornell Institute for Digital Collections, who served as project advisor. All of these people faced a steep learning curve to become familiar with both electronic records management concepts and Cornell's unique characteristics.

Early in the project, the ERP team decided that its primary interest was in the academic and student services module of P2K. This module, once implemented, would contain the most records of permanent archival value. The university administration, however, had decided that the first module, the human resources and payroll module, had to be functional by January 1999, for the first pay period of the new year. Throughout the fall of 1998, installation difficulties made it increasingly uncertain that the P2K staff could bring it up on time. They were able to make it functional in time for the first pay period, but there were several serious problems. Months later, they were still working out the glitches. In addition, the P2K team could consider none of the requested modifications to the payroll system. As a result, the implementation of the academic and student services module was postponed indefinitely.

In March of 1999, the ERP team held a candid conversation with one of the P2K directors. He described the difficult situation confronting his staff, who were overwhelmed with trying to keep alive those components of the system that were still functioning and to fix those that were not working. They had no time to even consider preventative care or improving the usability of the system, let alone enhancements, such as building in the recordkeeping requirements that the archives was requesting.

This left the ERP Team in a dilemma. In its initial phase, the project had experienced some successes. The project archivist completed an electronic records survey in the College of Arts and Sciences and the College of Human Ecology. The survey had revealed that while many records were being created electronically, most were not being kept electronically. Particularly with documents that imitated paper forms, printouts were being kept within the regular paper filing systems. In many cases, the official format of the record remained paper. Financial reports and official correspondence in email form came to the forefront as records in electronic format that needed to be addressed. The ERP team had also begun to analyze the replication of college records in the central systems. By meeting with managers at all levels, the project had raised the profile of electronic records management issues across campus and of the University Archives program in general.

When the implementation of P2K became a struggle, however, the project could not be completed as

ment has largely ignored. These efforts can include the identification and preservation of significant materials, particularly those in danger of destruction or deterioration; increased recruitment, training, and communication among those responsible for the custody, use, and interpretation of these documentary materials; and an enlargement of the list of potential subjects of documentary editions to embrace individuals and organizations from under-documented groups. This resolution also encouraged the staff to partner with the Smithsonian Institution's National Museum of the American Indian and with the American Association for State and Local History to organize a meeting of Native American archivists and records keepers.

- Recognizing the contributions of and bidding farewell to Executive Committee chair Ms. Anne R. Kenney, who represents the Society of American Archivists, and Executive Committee member Dr. William H. Chafe, who represents the Organization of American Historians. This meeting marked the end of the terms of both Commission members.

Chairman Carlin announced that he was appointing Dr. Charles Cullen, the representative of the Association for Documentary Editing, and Ms. Fynnette Eaton, the incoming representative of the Society of American Archivists, to the Executive Committee. Commission members noted the usefulness of the Executive Committee, which was created by Chairman Carlin in November 1997.

Chairman Carlin welcomed new Commission member Dr. Roy Turnbaugh, the State Archivist of Oregon, to his first Commission meeting as the representative of the National Association of Government Archives and Records Administrators. In addition to Mr. Carlin and Dr. Turnbaugh, the following Commission members were present at the November 14 meeting: Dr. Nicholas C. Burckel, Presidential Appointee; Dr. William H. Chafe, representing the Organization of American Historians; Dr. Charles T. Cullen, representing the Association for Documentary Editing; Dr. Brent D. Glass, representing the American Association for State and Local History; Dr. Alfred Goldberg, representing the Department of Defense; Ms. Margaret P. Grafeld, representing the Department of State; Ms. Anne R. Kenney, representing the Society of American Archivists; Mr. Marvin F. "Bud" Moss, Presidential Appointee; and Associate Justice David H. Souter, representing the U.S. Supreme Court.

Mr. Geoffrey H. Brown, Senior Legislative Assistant to Senator James Jeffords (R-VT), who represents the U.S. Senate, sat in for the Senator, who was unable to attend. Others unable to attend were Rep. Roy Blunt (R-MO), who represents the U.S. House of Representatives; Dr. Mary Maples Dunn, who represents the American Historical Association; and Mr. Winston Tabb, who represents the Librarian of Congress.

Founding-Era Documentary Editing Projects

- Massachusetts Historical Society, Boston, MA: A conditional grant of up to $140,832 to support the preparation of a comprehensive book edition of *The Adams Papers.*
- Yale University, New Haven, CT: A conditional grant of up to $154,000 to assist its work on a comprehensive book edition of *The Papers of Benjamin Franklin.*
- Princeton University, Princeton, NJ: A conditional grant of up to $154,731 to support its work on a comprehensive book edition of *The Papers of Thomas Jefferson.*
- University of Virginia, Charlottesville, VA: A conditional grant of up to $139,200 to continue work on a comprehensive book edition of *The Papers of James Madison.*

Commission members Charles T. Cullen, Marvin F. "Bud" Moss, William H. Chafe, and Brent D. Glass participating in the November Commission meeting. In the background are Mary A. Giunta and Fynnette Eaton. Photograph by Earl McDonald, NARA.

- University of Virginia, Charlottesville, VA: A conditional grant of up to $143,661 to edit a comprehensive book edition of *The Papers of George Washington.*
- The George Washington University, Washington, DC: A conditional grant of up to $187,140 to continue editing *The Documentary History of the First Federal Congress, 1789-1791.*
- Board of Regents, University of Wisconsin, Madison, WI: A conditional grant of up to $160,000 to continue editing a selective book edition of *The Documentary History of the Ratification of the Constitution.*
- Supreme Court Historical Society, Washington, DC: A conditional grant of up to $216,150 to edit a selective book edition of *The Documentary History of the Supreme Court, 1789-1800.*

Founding-Era Subventions

- University Press of Virginia, Charlottesville, VA: A subvention grant of $10,000 for *The Papers of George Washington*, Revolutionary War Series, Vol. 11.
- State Historical Society of Wisconsin, Madison, WI: A subvention grant of $9,500 for *The Documentary History of the Ratification of the Constitution*, Vol. 7.

State Board Planning, Implementation, and Regrant Projects; Collaborative Projects

- Florida State Historical Records Advisory Board, Tallahassee, FL: A conditional 2-year grant of $100,000 ($100,000 matching) for its Regrant Project to address the goals in the board's recently revised strategic plan.
- Kansas State Historical Records Advisory Board, Topeka, KS: A conditional grant of $36,741 ($30,000 matching) for up to 2 years for its Regrant Project to begin to implement the three priorities in its recently completed strategic plan.
- Maine State Historical Records Advisory Board, Augusta, ME: A conditional grant of $114,262 ($100,000 matching)for up to 3 years for its SHRAB Regrant Project to continue to improve preservation of and access to Maine's historical records by establishing a matching grant program for the state's small- and medium-sized repositories.
- Missouri State Historical Records Advisory Board. Jefferson City, MO: A conditional grant of $300,000 ($300,000 matching) for up to 3 years for its SHRAB Regrant Project to preserve and make accessible Missouri's historic records and to promote archival education and cooperative strategies among records keepers.

Commission members Roy C. Turnbaugh, Margaret P. Grafeld, Anne R. Kenney, Nicholas C. Burckel, and David H. Souter participating in the November Commission meeting. On Justice Souter's right is Geoffrey H. Brown, Senior Legislative Assistant to Senator James Jeffords, who sat in for the Senator. In the background are Roger A. Bruns, Timothy D.W. Connelly, and Daniel A. Stokes. Photograph by Earl McDonald, NARA.

• Pennsylvania State Historical Records Advisory Board, Harrisburg, PA: A conditional grant of $188,200 ($170,000 matching) for up to 3 years for its SHRAB Regrant Project to support the Pennsylvania board's new 10-year strategic plan and to preserve and provide access to the Commonwealth's documentary heritage.

• South Carolina State Historical Records Advisory Board, Columbia, SC: A conditional grant of $171,000 ($150,000 matching) for up to 3 years for its Regrant Project to implement major elements of its recently revised strategic plan.

• Utah State Historical Records Advisory Board, Salt Lake City, UT: A conditional grant of $75,180 ($63,000 matching) for up to 3 years for its Regrant Project to promote the establishment and enhancement of regional records repositories in Utah.

• American Association for State and Local History, Nashville, TN: A conditional 1-year grant of $71,123, in partnership with the Council of State Historical Records Coordinators (COSHRC) to help administer COSHRC activities and to begin implementing the action agenda of the National Forum on Archival Continuing Education. The grant includes funds, to be administered by AASLH, to help support the planning of a conference for Native American archivists and records keepers, in partnership with the Smithsonian Institution's National Museum of the American Indian.

State Board Administrative Support Projects

• Connecticut State Library, Hartford, CT: A grant of $9,300 in partial support of the Connecticut board's administrative expenses for 10 months.

• Florida State Historical Records Advisory Board, Tallahassee, FL: A grant of $10,000 in partial support of the board's administrative expenses for 1 year.

• Georgia State Historical Records Advisory Board, Atlanta, GA: A grant of $10,000 in partial support of the board's administrative expenses for 2 years.

• Iowa State Historical Records Advisory Board, Des Moines, IA: A conditional grant of up to $15,000 in partial support of the board's administrative expenses for 2 years.

• Kansas State Historical Records Advisory Board, Topeka, KS: A grant of $11,500 in partial support of the board's administrative expenses for 2 years.

• Minnesota State Historical Records Advisory Board, St. Paul, MN: A grant of $7,661 in partial support of the board's administrative expenses for 1 year.

• Mississippi State Historical Records Advisory Board, Jackson, MS: A grant of $6,371 in partial support of the board's administrative expenses for 1 year.

• Nevada State Historical Records Advisory Board, Carson City, NV: A grant of $19,535 in partial support of the board's administrative expenses for 2 years.

• New Hampshire State Historical Records Advisory Board, Concord, NH: A grant of $15,000 in partial support of the board's administrative expenses for 2 years.

• New Mexico State Historical Records Advisory Board, Santa Fe, NM: A grant of $14,800 in partial support of the board's administrative expenses for 2 years.

• Library of Virginia, Richmond, VA: A grant of $9,421 in partial support of the board's administrative expenses for 21 months.

• West Virginia Division of Culture and History, Charleston, WV: A grant of $9,906 in partial support of the West Virginia board's administrative expenses for 1 year.

• Wyoming Department of State Parks and Cultural Resources, Cheyenne, WY: A conditional grant of up to $5,000 in partial support of the Wyoming board's administrative expenses for 8 months.

Electronic Records Projects

• Arizona State University, Tempe, AZ: A conditional 2-year grant of $125,000 for its ECURE 2001/2002: Preservation and Access for Electronic Records of Higher Education Project to fund the planning and implementation of two conferences and two executive development seminars related to electronic records at colleges and universities.

• The Regents of the University of California: A conditional 2-year grant of up to $90,000, on behalf of the University of California at Los Angeles for its Information Technology and Policy Curricula Project to identify educational needs in the area of electronic records management.

• The Trustees of Indiana University, Bloomington, IN: A conditional 2-year grant of $94,642 for its Developing Instructional Programs in Electronic Records Management Project to develop and teach classes on electronic records management.

• The Global Industry Interagency Group, Woburn, MA: A conditional 15-month grant of up to $200,000 for its Good Electronic Recordkeeping Practices Project to pull together from the best available knowledge and practices Good Electronic Records Practices for the long-term preservation of and access to electronic records.

• Minnesota Historical Society, St. Paul, MN: A conditional 2-year grant of $150,546 for its Educating Archivists and Their Constituencies Project to develop workshops on the eXtensible Markup Language (XML) and metadata as they apply to archival concerns about electronic records.

• State University of New York, University at Albany, Albany, NY: A 15-month grant of $355,392 in support of its Long-Term Preservation of Authentic Electronic Records Project, which supports the non-NARA elements of the U.S. research team taking part in the InterPARES Project.

• The Ohio Historical Society, Columbus, OH: A conditional 3-year grant of up to $100,000 for its Developing Best Practice for a Semi-Custodial Electronic Records Repository Project.

• South Carolina Department of Archives and History, Columbia, SC: A conditional 2-year grant of up to $37,460 for its Electronic Records Training and Awareness Program to develop and conduct six workshops on electronic records issues.

• The University of South Carolina, Columbia, SC: A conditional 1-year grant of up to $46,960 for its Model Editions Partnership: Archiving Documentary Editions Project to determine the feasibil-

Retiring Commission members William H. Chafe and Anne R. Kenney cut the cake celebrating NHPRC's reauthorization. Photograph by Earl McDonald, NARA.

ity of establishing a service center to archive the electronic files used by Commission-supported projects to produce printed volumes.

Non-Founding-Era Subventions

• University of Illinois Press, Champaign, IL: A subvention grant of $8,452 for *The Southern Debate Over Slavery: Petitions to Southern Legislatures, 1778–1864*, Vol. 1.

• University of Illinois Press, Champaign, IL: A subvention grant of $7,541 for *The Selected Letters of Lucretia Coffin Mott*, including the Calendar.

• Johns Hopkins University Press, Baltimore, MD: A subvention grant of $10,000 for *The Papers of Dwight D. Eisenhower*, Vol. 18.

• Johns Hopkins University Press, Baltimore, MD: A subvention grant of $10,000 for *The Papers of Dwight D. Eisenhower*, Vol. 19.

• Johns Hopkins University Press, Baltimore, MD: A subvention grant of $10,000 for *The Papers of Dwight D. Eisenhower*, Vol. 20.

• Johns Hopkins University Press, Baltimore, MD: A subvention grant of $10,000 for *The Papers of Dwight D. Eisenhower*, Vol. 21.

Educational Proposals

• Wisconsin History Foundation, Inc., Madison, WI: A grant of $30,602 to support the 30th Institute for the Editing of Historical Documents.

Barbara J. Fields Joins Commission

The Organization of American Historians (OAH) has named Barbara J. Fields, a professor of history at Columbia University specializing in the history of the American South, to be its representative on the National Historical Publications and Records Commission. She succeeds William Chafe, Dean of the Faculty of Arts and Sciences at Duke University, in that capacity.

Dr. Fields received her undergraduate degree from Harvard University, and her master's and doctorate from Yale University, where she studied under C. Vann Woodward. Before joining the faculty at Columbia University in 1986, she taught at the University of Michigan. She was visiting editor at the Freedmen and Southern Society project at the University of Maryland during the 1981–1982 academic year.

Dr. Fields is the author of *Slavery and Freedom on the Middle Ground: Maryland during the Nineteenth Century* (1985), and the co-author and co-editor (with members of the Freedmen and Southern Society project) of *Freedom: A Documentary History of Emancipation, 1861–1867*, Series I, Volume I, *The Destruction of Slavery* (1985); *Free at Last: A Documentary History of Slavery, Freedom, and the Civil War* (1992); and *Slaves No More: Three Essays on Emancipation and the Civil War* (1992). She was a featured commentator in Ken Burns' PBS documentary *The Civil War*. The recipient of numerous awards and honors, she was a John D. and Catherine T. MacArthur Fellow from 1992 to 1997.

planned. The student system was being postponed, and the payroll system had no records identified as having permanent archival value. The team continued to be unable to gain access to the system schema for either module and was therefore unable to do any systems analysis of the modules. Finally, the project archivist, the only full-time member of the ERP Team, announced that she was leaving the project for a permanent position at the National Archives.

With only 6 months of funding remaining, we needed to redirect our efforts. The project director held very helpful discussions with Mark Conrad from the NHPRC staff. We agreed that Cornell would restructure the project to focus on the specific goal of defining archival requirements for electronic student records systems (ESRS). Nancy McGovern, a highly qualified senior consultant who had done extensive work as an electronic records manager and who had a block of time available, was hired to compile a report. During the summer and fall of 2000, she visited Cornell for an extended period, interviewing relevant staff in the Cornell University Archives, the Registrar's Office, and Cornell Information Technologies. The goals of her report, which will be completed by the end of the calendar year 2000, were to

• Provide a starting point for universities to consider their electronic student records systems.

• Propose approaches and considerations for preserving electronic student records.

• Present the technical and organizational context for electronic student records systems.

• Provide relevant sources and research citations for further research and applied projects.

The report will provide generalizable recommendations, address records management and archival considerations, provide pros and cons for preservation options, and identify potential research issues for student records. By presenting the findings of the Cornell project, the report is intended to serve as a base and provide a context for universities to consider their electronic student records systems and to establish an appropriate preservation strategy. It will be structured to deal with four types of issues:

1. Universal systems issues that are relevant for preservation, regardless of the type of system that is being considered, including general recordkeeping requirements and long-term access issues.

2. Generic concerns that pertain to electronic student records systems, but are not institution- or system-specific, including retention guidelines and records management concerns, the American Association of College Registrars and Admissions Officers (AACRAO) metadata definition for academic records and transcripts, and archival concerns.

3. System-specific implementation issues, including concerns that are defined by the system implementation and that may be specific to the organizational environment in which the system is implemented.

4. Preservation approaches and strategies that must be suited to the resources and requirements of the organization and the requirements of the records.

The report will make recommendations specific to Cornell, but should be helpful to all university archivists. It will suggest specific strategies, but also recommend further individual and collaborative research projects. We hope that the wide distribution of this report will serve to refocus our energies locally and to assist others.

We learned a number of lessons from the various components of this project. Electronic records issues are extremely complex. At this stage, we have no definitive answers; we are still raising the questions. We cannot continue to see the establishment of electronic records systems simply as projects, since the learning curves required are too steep. These issues need to be integrated into library and archival programs, with regular staff assigned to them. Archival education programs must strengthen their electronic records course components, so new staff can get up to speed quickly. Archivists must work in larger institutional contexts. In a university setting, for example, we must form alliances with computer scientists and information technologists. Electronic records management is an exciting and fast-changing area. Unless we are prepared to participate in the process, we will be unable to fulfill our archival mandate.

ELAINE D. ENGST IS DIRECTOR OF THE DIVISION OF RARE AND MANUSCRIPT COLLECTIONS AND UNIVERSITY ARCHIVIST AT CORNELL UNIVERSITY. CHERYL STADEL-BEVANS IS AN ARCHIVES SPECIALIST WITH NARA'S ELECTRONIC AND SPECIAL MEDIA RECORDS SERVICES DIVISION.

Toward Building Software-Independent Electronic Records Frameworks

BY AMARNATH GUPTA, BERTRAM LUDAESCHER, AND RICHARD MARCIANO

A team of researchers from the San Diego Supercomputer Center (SDSC) at the University of California San Diego has begun work on a 3-year research project aimed at long-term preservation of, and access to, software-dependent data objects. Members include Amarnath Gupta and Richard Marciano, with the participation of Bertram Ludaescher and Reagan Moore. The team is prototyping an Archivists' Workbench (AW) software package, that consists of tools to partially automate the process of creating and managing software-independent data objects. The Archival Advisory Board includes Phil Bantin (Indiana University Archives), Charles Dollar (Dollar Consulting), Patricia Galloway (University of Texas-Austin), Anne Gilliland-Swetland (UCLA), Peter Hirtle (Cornell Institute For Digital Collections), Robert Horton (Minnesota State Archives), Theodore Hull (NARA), Heather MacNeil (University of British Columbia), Tom Ruller (New York State Archives), Lee Stout (Penn State University Archives), Ken Thibodeau (NARA), and Caryn Wojcik (Michigan State Archives).

The Electronic Record Preservation Dilemma

The long-term preservation of electronic records has to deal with the inherent technology-dependence of "digitally born" information. Any digital information is produced with the help of some software, and aspects such as information representation format, internal organization structure, and external look and feel are often tightly bound to the software that produced it, leading to an inevitable preservation dilemma. On the one hand, we want to preserve records in their original form, while on the other hand, software, by its very nature, is apt to change and become obsolete, thus endangering the accessibility of a preservation-worthy record. This dilemma constitutes the setting of our NHPRC project, where the goal is to investigate whether software independence is indeed attainable for electronic records containing textual, compound, and spatial or Geographic Information System (GIS)-produced documents. The central thesis of the project is that several forms of electronic records can indeed be transformed into content-equivalent proxies using eXtensible Markup Language (XML) or its derivative languages, and in practice may be sufficient to satisfy most user requests to access these records.

Characterizing Software-Independent Records

Our initial task was to elaborate on the definition of software independence. We consider an electronic record as a digital object, with a known structure, and a set of attributes (metadata) that capture the context of the object. Some of this metadata may include information about the process used to create the object. Other metadata may represent annotations that were made on the object, but were not a part of the object itself. An example of this may be annotations made by the reader of a Portable Document Format (PDF) or a Microsoft Word document. Another example may be a web site (a compound document) created around a collection of electronic records. Further, we consider the record to be composed of recognizable sub-compo-

nents. In some cases, such as images inside a Microsoft Word document, or attachments inside electronic mail, these components may be considered as "links" connecting the primary body of the document to auxiliary content. We believe that a software-independent representation of an electronic record is a schema together with a set of index structures that satisfy the following conditions:

- Digital objects and object components in the original electronic record are uniquely identifiable
- Textual and non-textual objects are represented in a standard, lossless format
- Schemas and the indices preserve sufficient information to reconstruct the original complex records from which the software-independent representation was created
- Schemas and indices can be augmented to create new object groupings, inter-object associations, and annotation superstructures to permit a different organization and access structure to the same original materials
- Schemas and indices can be automatically externalized through a universal encoding such that the physical technology supporting the implementation of the electronic record collection can be changed without affecting the content and structure of the record or collection. The externalized representation should be information preserving and storable on a persistent medium.

Clearly, this also implies that the software-independent representation of electronic records need not be unique, and external factors such as cost and storage requirements may be used to exercise a preference of one representation over another.

Next, we consider the issue of the methodology that could be adopted to create a software-independent representation of a collection of electronic records.

An ingestion process model is being developed where three kinds of information processing phases are carried out in order to derive the software-independent representations satisfying the above criteria: *model generation*, *information regeneration*, and *collection management*.

Model Generation Loop

To analyze the necessary and sufficient elements of an electronic record, we create an initial *accessioning template* (AT), named after the notion of "Template for Analysis" [GSE00] and created from an initial set of exemplars. Whereas the Template for Analysis identifies and defines all the possible elements that a record may contain (including medium, extrinsic and intrinsic elements, annotations, and context), the AT primarily identifies and defines the "Documentary Context," meaning an abstraction of the internal structure of the electronic records.

The AT is thus a working hypothesis or model about the necessary and sufficient *data elements* of a record. As such, it is a con-

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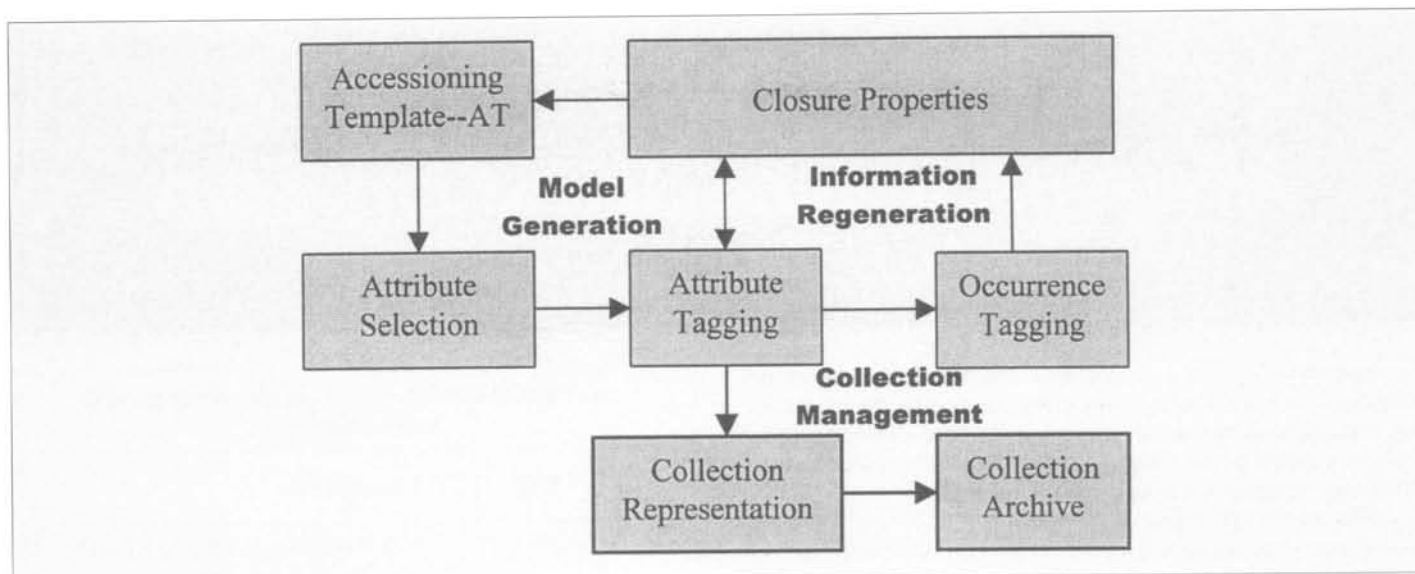
ceptual model of the collection and can be expressed using any suitable formalism (e.g., IDEF0 model,[1] topic map, Resource Description Framework or RDF, Entity-Relationship or E-R-diagram, Unified Modeling Language or UML).

In our case, the AT is first used to identify an initial set of data attributes (*attribute selection*) to be extracted from the raw, software-dependent format.

By applying data extraction rules (for the selected attributes) to the whole collection (*attribute tagging*), it is often the case that the initial AT has to be revised and refined to include newly gathered insights into the underlying collection model. For example, the refinement may cause the flattening of complex attributes. The refined set of attributes induces a new processing round in the model generation loop. This loop is iterated until the model completely covers all records of the collection. Since a semistructured data format (XML) is used, structural variations in the records can be captured easily.

Information Regeneration Loop

In addition to the attribute tagging, the *occurrence* of the extracted attributes in their original raw format has to be recorded (*occurrence tagging*) in order to preserve the original document information (i.e., structure and content). We use the following generic triplet format ("OAV format"):

(occurrence, attribute-name, attribute-value)

Here, occurrence can be a complex "positional attribute" itself, comprising one or more components like *filename, line number, byte offset*, etc. This allows us to tag attributes with additional positional information, so that the original document information (structure and content) can be regenerated from the software-independent format at a later point.

The OAV format itself can be preserved in XML and allows generation of different (inverse) index structures for collection analysis and restructuring.

The process of tagging attributes with occurrence information allows for the design of simple ingestion programs (*wrappers*) that

only tag occurrences. More complex relationships do not have to be instrumented into the wrapper, as they can be extracted at a later stage. Also, it is more prudent in terms of model global relationships once all elementary information has been parsed and wrapped. By delaying such actions until later phases and expressing them through rules, relationships can be revised or modified without affecting the wrapping process itself.

Collection Management

The ingestion process model makes use of a *collection representation* and a *collection archive*. The *collection representation* is produced after reaching closure on the aforementioned loops. For example, it may contain any intermediary or final product, such as

- original source files
- occurrence-tagged version stored as XML
- ingestion rules and Accessioning Template(s)/conceptual model(s)
- semantic views on the collection using the emerging standards, such as Topic Maps

The *collection archive* is simply the storage place for the final encapsulated software-independent image of the input collection, the one that gets archived.

Test Cases

We are using two collections, shared with us in the context of a collaboration with the National Archives and Records Administration, as test cases for the refining the above framework:

1. The Senate Legislative Activities collection (an extract of the 106th Congress database, that keeps track of bills, resolutions, and amendments, per Senator).
2. The Franklin D. Roosevelt Library, Museum, and Digital Archives.

References

[GSE00] Anne Gilliland-Swetland, and Philip B. Eppard. "Preserving the Authenticity of Contingent Digital Objects," *D-Lib Magazine*, 6, no. 7/8 (July/August 2000) *www.dlib.org/dlib/july00/eppard/07eppard.html*

AMARNATH GUPTA, BERTRAM LUDAESCHER, AND RICHARD MARCIANO ARE RESEARCHERS AT THE SAN DIEGO SUPERCOMPUTER CENTER AT THE UNIVERSITY OF CALIFORNIA, SAN DIEGO.

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[1] Developed for the Air Force, IDEF0 is a family of methods for modeling the functions of an organization and mapping them to a system or process. IDEF0 modeling was used to develop the Department of Defense Design Criteria Standard for Electronic Records Management Software Applications, DoD 5015.2-STD. For more information about IDEF modeling, visit the following URL: *www.idef.com/idef0.html*

New Tools for Building and Managing Electronic Records Access Programs

BY STEPHANIE SIMON

E-government. E-commerce. E-solutions. But what about e-records? Whether Government agencies are doing business via the Internet or just keeping track of contacts through a database, it's important for them to understand the unique and complex issues related to managing and providing access to electronic records.

The Center for Technology in Government (CTG) at the University at Albany recently completed a 2-year project on how public and private sector organizations acquire, save, maintain, and retrieve electronic business records for primary and secondary uses. Gateways to the Past, Present, and Future: Practical Guidelines to Secondary Uses of Electronic Records was funded in part by a $350,000 grant from the National Historical Publications and Records Commission. The project, which grew out of a partnership with the New York State Archives, involved an international group of experts and resulted in a set of practical guidelines that will help public sector organizations respond to the growing demand for information in electronic form and for direct access to these electronic records.

The project was designed to produce robust records management processes and models to ensure that the electronic records maintained by Government agencies will be available and useable for the widest variety of contemporary and future public uses. Through a review of "best practices" and project-based research, the project addressed recordkeeping requirements in the context of the broad spectrum of historical and other secondary uses.

The primary use of Government records is to support and document specific business processes. Government information is also used to support business processes in other agencies, give the public access to needed information, support evaluation of programs, inform policy making, plan facilities, and serve as legal and historical records of Government decisions. Sometimes, the importance of these uses outweighs those of the original ones.

"The growing demand for information available in electronic form and for direct access to electronic records—including data sets, documents, images, and audio files—is changing the design and management of records access programs. Programs are becoming increasingly focused on electronic records and methods of electronic access as the means of providing access to users," said CTG Project Director Theresa Pardo. The project focused on the complex process of responding to this demand by designing and implementing electronic records access programs.

That's where the main product from the Gateways project enters the picture. "A Practical Guide for Building Electronic Records Access Programs" details four tools for assessment, diagnosis, program design, and cost estimation. Organizations can use this guidebook to create effective, manageable, and affordable electronic records access programs. The guidebook can be used to develop new programs or to revise existing ones.

The tools in the guidebook help electronic access providers work through the various stages of electronic records access program design and development. In particular, the tools support the analysis of the complex set of interactions that must be considered in the development of these access programs. The tools are

| A Practical Guide for Building Electronic Records Access Programs	
Tool	**Description**
Assessment	Use this tool to get the "big picture" of the considerations you must take into account when building such a program.
Diagnostic	This tool helps you understand the interactions among different policies, management mechanisms, and technologies involved in the access program.
Program design	Use this tool to study characteristics, interactions, and alternatives that will enable you to determine the main features of the program design.
Cost estimation	This tool helps you work through the various costs and benefits of implementing and operating various program designs.

used in an iterative process in which each is applied to a situation, generating an outcome. The outcome is then used to both move forward in the analysis and reflect back on the earlier analysis so that new information can be factored into the design and process.

The Guide leads the planner through the assessment of the various dimensions of these programs including information suppliers, users, content, and use. Additional dimensions related to aspects of the access program and its organizational context are also assessed. Once the specific dimensions of the situation involving electronic records needs has been assessed, the Guide provides an approach to diagnosing the various interdependencies among the dimensions. This diagnosis helps planners understand how the characteristics of some dimensions affect or are affected by others.

The planner can then use the design tool to consider the various approaches that might work in developing and managing a program to meet these needs. The design tool helps planners specify the characteristics of modest, moderate, and elaborate approaches to a program. Reviewing these approaches in the context of benefits begins to help planners decide which to pursue. The cost estimation tool then works closely with the design tool by providing a structure to capture the range of planning, staffing, technology, and data-related costs associated with electronic records access programs. Working iteratively between the design tool and the cost estimation tool, the planner can consider the relative benefits of the different approaches in terms of the costs and continue to refine the plan until the best balance between cost and desired functionality is achieved.

A Practical Guide for Building Electronic Records Access Programs

- Assessment
- Diagnosis
- Program Design
- Cost Estimation
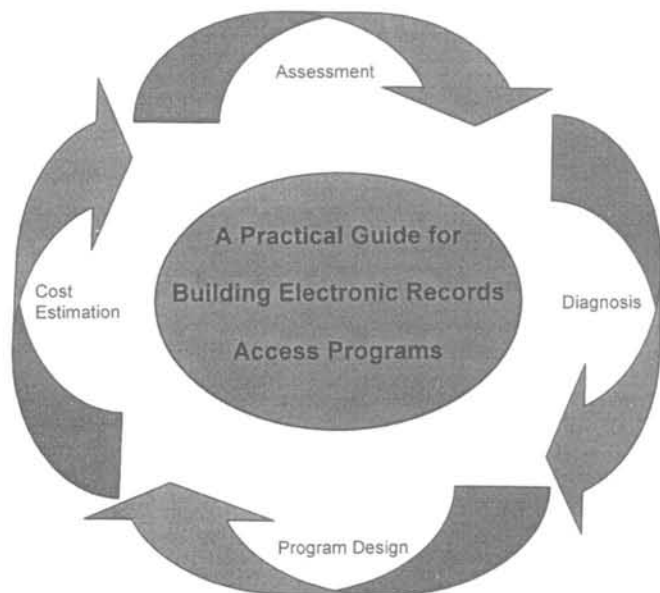
The guidebook was created through a collective effort and extensive research. The project team investigated current practices in electronic records management. Researchers interviewed more than 22 people from both across the United States and internationally whose jobs involve providing access to electronic information for secondary uses. The team also researched current and best practices on resource sharing models and analyzed and used the resulting information to map out a series of information-use models.

CTG also organized the Gateways Advisory Committee to provide advice and feedback. This group of information technology and electronic records professionals came from 19 organizations including the NYS Division of the Budget, University at Albany Information Science and Policy Program, Syracuse University Center for Science and Technology, The New York State Office for Technology, Xerox Corporation, and Rand Corporation. The full Committee met twice and dealt with such issues as the definitions of primary and secondary use, models of information use, and the contents of the guidebook.

"The Advisory Committee gave us excellent reactions to our work," Pardo said. "They were very engaged throughout the process and gave us very useful feedback."

Two CTG projects with significant electronic records components, the Kids Well-being Indicators Clearinghouse (KWIC) and the Homeless Information Management System (HIMS), provided ideal testbed environments for the development of the Guide. Each of the projects faced the challenge of developing electronic records access programs. KWIC is a prototype Web-based resource that addresses the need for more rapid and timely access to health and well-being indicator data about children in the State of New York. The HIMS prototype is a Web-based integrated data repository with homeless service information from local governments, program providers, and state agencies. A common theme throughout these two projects was the goal of increasing the use of information for planning and decisionmaking by providing a Web-based program of access to electronic records. In both projects the teams struggled with the goal of designing access programs to meet the needs of users, while ensuring that the design 1) could be sustained, 2) did not threaten the privacy or confidentiality of data contributors, and 3) provided sufficient metadata and tools to ensure appropriate use of the data.

Once the bulk of the Gateways work was completed, the project team convened an Expert Panel to provide feedback on the findings. This group of electronic records experts came from such diverse organizations as the Washington State Archives, Rand Corporation, the National Archives and Records Administration, and the University of Cologne, Germany.

The Center will build on the work done in the Gateways project by implementing the Guide as a Web-based workbench. The workbench will provide dynamic access to the new analytical frame presented in the Guide. The Center for Technology in Government is one of three principal partners in the Education, Outreach, and Training program of the National Partnership for Computational Infrastructure (NPACI). This National Science Foundation Initiative is designed to build bridges between the computational scientists and government practitioners. As part of this program, the Guide will be implemented as a Web-based workbench to support real time analysis of the complex factors involved in building an electronic records access program. Worksheets and other tools to support the process of assessment, diagnosis, design, and cost estimation will be implemented in the workbench. In addition, the workbench will provide access to related resources, current and best practices in electronic access programs, and additional tools.

To receive a hard copy of the Gateways practical guidelines, call CTG at 518-442-3892 or email info@ctg.albany.edu. You can also download the guidelines from *www.ctg.albany.edu/projects/gateways/gatewaysmn.html*.

STEPHANIE SIMON IS INFORMATION COORDINATOR FOR THE CENTER FOR TECHNOLOGY IN GOVERNMENT (CTG). CTG IS AN APPLIED RESEARCH CENTER DEVOTED TO IMPROVING GOVERNMENT AND PUBLIC SERVICES THROUGH POLICY, MANAGEMENT, AND TECHNOLOGY INNOVATION. LOCATED AT THE UNIVERSITY AT ALBANY, STATE UNIVERSITY OF NEW YORK, CTG WORKS WITH GOVERNMENT, CORPORATE, AND ACADEMIC PARTNERS TO PURSUE NEW WAYS OF APPLYING COMPUTING AND COMMUNICATIONS TECHNOLOGIES TO THE PRACTICAL PROBLEMS OF INFORMATION MANAGEMENT AND SERVICE DELIVERY IN THE PUBLIC SECTOR. VISIT CTG ONLINE AT *WWW.CTG.ALBANY.EDU.*

Strategies for Managing Electronic Records:

Lessons Learned from the Indiana University Electronic Records Project

BY PHILIP BANTIN

Introduction

Various research projects have been undertaken to address the challenges presented by electronic records. The most prominent are those devoted to developing basic requirements for recordkeeping systems and to identifying documentation or metadata that must be present to create reliable and authentic records. There have been, however, very few implementation projects designed to test any of these theories and concepts. The Indiana University Electronic Records Project is an implementation project that was designed to develop a strategy and methodology for incorporating recordkeeping requirements into IU's transaction processing and information systems. Questions being asked by project staff include: Will traditional methods for identifying, appraising, and describing records still have value in managing electronic records, or will we have to significantly change the way we do business? What new skills will be needed? What changes need to be made to transaction process systems to make them function effectively as recordkeeping systems? How does one insert the archives program into the process for designing, analyzing, and auditing electronic information systems on the IU campus? Who are an archivist's strongest allies in the management of electronic records, and which issues will resonate with these partners? In this article, I will address these issues in the context of three lessons we have learned in the implementation process during the past 5 years.

Lesson 1: Traditional records management strategies established for paper records will have to be altered in significant ways to accommodate electronic records.

Experience strongly suggests that archivists and records managers will have to implement new techniques and methodologies to be effective in the digital world. Whether this will result in a major overall reengineering of the process is not clear. My experience indicates, however, that the change will involve more than a mere tweaking or refining of traditional methodologies for managing records. I believe that records management professionals will have to devise new strategies for addressing some of the most basic issues, such as how we identify and capture records in an automated environment, how we ensure that inviolate records are preserved for as long as necessary, how we appraise the value of records, how we document records, how we ensure that a complete record is captured, and when, or at what point, we undertake these tasks.

In my opinion, the most important and profound change will be the creation of an overall strategy that views conceptual model building as the primary methodology for dealing with many or most of the issues the profession faces in attempting to manage records in automated environments. In other words, rather than physically reviewing records and systems to conduct such basic activities as appraisal and description, records professionals would be creating and employing conceptual models designed to analyze and document record systems. Employing this approach, the equivalent of a traditional records survey would be the creation of business process models (i.e., conceptual models of functions and transactions that identify business records). Appraisal of records would still be undertaken by employing traditional appraisal values, but the analysis would be based on conceptual models of the processes and records rather than on a physical review of data content. Evidential values would be derived from business process and metadata models, and informational values from reviewing data and metadata models. In documenting records, a complete, authentic, and reliable record would be captured not by physically reviewing the record but by analyzing metadata and data models and by comparing the results to an established set of metadata specifications and record-keeping requirements.

Lesson 2: The primary data and information systems employed by most institutions are poor recordkeeping systems.

Transaction Processing Systems Employing DBMS Software

The most basic business system and the heart of most organizations is the Transaction Processing System (TPS). A transaction processing system "is a computerized system that performs and records the daily routine transactions necessary to the conduct of business." The primary goal of these systems is to automate computing of intensive business transactions, such as those undertaken in the financial and human resource functional areas. The emphases is on processing data (sorting, listing, updating, merging); on reducing clerical costs; and on outputting documents required to do business, such as bills, paychecks and orders. The guiding principle of these systems is to create data that is current, up-to-date, accurate, and consistent. To achieve this goal, these systems employ Database Management System (DBMS) software. One of the primary advantages of DBMS is its ability to limit and control redundant data in multiple systems. Instead of the same data field being repeated in different files, the information appears just once. Another advantage of DBMS is that it improves data integrity. Updates are made only once, and all changes are made for that data element no matter where it appears.

TPS does not routinely capture records.

Without question, TPS are very good at supporting current business needs for information, minimizing the amount of data stored in the system, improving overall efficiency of the system, removing obsolete data, and providing an organizational resource to current data. Archivists universally agree, however, that these systems do not routinely and systematically capture records. In these automated systems, business records are not routinely stored as stable, finite, physical entities. Rather, these systems create records by combining and reusing data stored in discrete units organized into related fields that form files. Once created, a record of a business process may not, indeed, likely will not, be captured as a physical entity.

TPS does not systematically preserve inviolate records.

Not only will the record not be captured at the time of creation, it may be impossible to recreate at some later date. Databases are dynamic, volatile systems, in a state of continual change. Data updates occur frequently, and with DBMS software managing the system, these revisions are made in every file containing that revised data element. Moreover, databases typically maintain only the current value for any given data element. Historical data, if kept at all, is usually incomplete or summarized. Consequently, historical "snapshots" of a database do not routinely capture the data values needed to reconstruct a specific record.

TPS does not systematically preserve complete, fully documented records (creating a complete set of record metadata and maintaining a physical relationship between the metadata and the record).

Even if all data values are captured in historical versions of the database, archivists argue the system is still not capturing and preserving records; retaining database tables preserves data not records. In most automated systems the physical relationship between the record content and the metadata that gives the content meaning often does not exist. Vital links between metadata and the record content data may exist only in the computer software program, or may not be a part of

Example of a Process Model Depicting Transactions and Records

Timekeeping
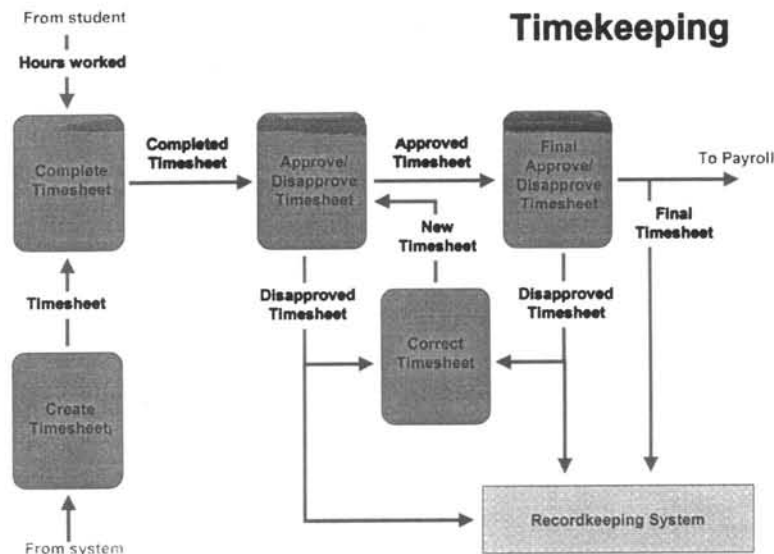
the automated system at all, but exist only as a paper document totally disassociated with the records it is describing.

Archivists have also discovered that system metadata as typically defined by systems designers and technologists is often not as complete as necessary to describe a record. Transaction logs maintained in typical TPS do contain some critical data on updates and revisions, but on the whole, archivists generally agree that these logs do not provide sufficient evidence. Of particular concern is the relative lack of metadata related to the context of creation and use — metadata that addresses the questions of why the record was created, who were the users of the record, and who had custody of the record? The availability of this contextual metadata, archivists argue, could make the difference between a useful and a useless record, particularly when viewed over longer periods of time.

Lesson 3: Forming partnerships with other information professionals is essential.

It has become a truism that the effective management of electronic records requires the archivist and records manager to form partnerships with various professions. What has not been sufficiently demonstrated through real-life experiences is who are the most important partners and how these partnerships will work. Based on experience, I have found three partners most valuable: decision support personnel, systems analysts, and internal auditors. Of the three, the IU archives has had the most experience and success working with internal audit.

Why is internal audit such a useful partner for the archivist and records manager? The answer can be found first in the fact that the missions of the two professions share many points in common. Both professions are interested in creating systems that are accountable, compliant, and trustworthy, and that produce accurate, reliable, and authentic records. Both professions acknowledge the importance of risk assessment and the value of understanding business requirements. It is not only the similarities in mission, however, that make this partnership or any partnership work effectively. Participants must also gain something valuable and unique from the collaboration. To be effective, the partnership must result in a win–win scenario. In the IU Archives–Internal Audit partnership, mutual benefits occur in several ways. The audit process employs a methodology based on detailed sampling of certain transactions, while the objective of the archives methodology is to achieve a broad, but less detailed analysis of all system functions.

When combined, these two methodologies complement one another, and both partners agree it results in a much more detailed, more complete analysis of the system. The two professions also complement one another in terms of the functions or issues they focus upon in their analysis of systems. For auditors, the primary concerns include data authenticity and accuracy, system security, adequate internal controls,

documentation (written procedures and instructions), backup procedures, and contingency planning. The archives staff, on the other hand, tends to focus on recordkeeping issues, such as record identification and capture, record metadata, access, and long-term preservation. Again, the result is a complementary analysis, which provides each partner with new and valuable information. The auditors gain access to previously unavailable analyses of systems from a recordkeeping perspective, and the archivists gain detailed knowledge about system security, data accuracy and input procedures, and system documentation.

Ultimately, however, I believe the greatest advantage for the archival program in this partnership is that it involves archives staff in the authorized and routine review of information systems. The value of partnering in the systematic, daily review of systems with a unit like internal audit, which has an institutional mandate and the authority to conduct these reviews, cannot be overemphasized. Working with audit is an effective strategy for inserting the archives and records management program into the mainstream process of designing, analyzing, and modifying electronic information systems.

Concluding Remarks

The digital world presents great opportunities but also great risks for records professionals. There is plenty of evidence of what appears to be a nationwide concern that automated systems are out of control and need to be better managed. I believe it is also true that records professionals are increasingly viewed as part of the solution, even as their role is not yet truly defined or understood. Therein lies our opportunity. The risks we face are that we will not adapt to our changing environment and consequently will not meet the challenge. In meeting the challenge, we must at the very least continue to make the case for recordkeeping systems, and not abandon our role or mission as the primary manager of this type of digital resource. However, it will require more from us than that. Experience at IU has demonstrated to me that records professionals working with automated systems will need to make some significant changes in the way they do business. I am convinced that traditional methods for identifying, appraising, and documenting records will not be effective without major modifications. I am also convinced that records professionals will need to develop new strategies and techniques to gain entrée to the systems and access to information managers and system documentation. In other words, it is not necessarily true that the mandate and lines of authority archivists and records managers created for paper records will carry over into the automated world. New partnerships and new management skills will be needed to firmly place records professionals within the process for designing, analyzing, and auditing electronic information systems.

PHILIP BANTIN IS DIRECTOR OF THE INDIANA UNIVERSITY ARCHIVES.

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H.R. 4110, the bill reauthorizing the NHPRC for fiscal years 2002-2005 with a cap of $10 million for grant funds, became Public Law 106-410 on November 1, 2000. Photograph by Earl McDonald, NARA.