

Managing Electronic Records and Assets: A Pilot Study on Identifying Best Practices

SAA Technology Best Practices Task Force

Naomi Nelson, Chair

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Preface

As a result of the Society of American Archivists Council's strategic planning in technology, a Technology Best Practices Task Force was formed in September 2006. The Council charged the task force to work with appropriate groups in SAA and ARMA International to identify competencies and standards and to collect, review, and clarify best practices relating to all areas of archival practice that are affected by electronic records and digital asset issues. The Council also directed the task force to compile a bibliography that SAA could make available on its website.

The purpose of the bibliography included in this report is to document the initial work of the task force. Through surveys of appropriate sources, the task force produced this preliminary bibliography and presented it to SAA leaders for feedback. Task force members were not unanimous about including all of the bibliography's citations. Further, the bibliography is not exhaustive and the task force is no longer building or editing it.

Archivists surveying current best practices on this and other topics might want to begin by consulting *Conducting Best and Current Practices Research: A Starter Kit*,¹ written by Ophelia Green for the Center for Technology in Government (University at Albany, SUNY, 2000).

Naomi Nelson (Chair)
Phil Bantin
Mark Conrad
Pam Duane
Mark Greene
Chris Paton
Richard Pearce-Moses
Robert Spindler
Carla Summers
Nancy Zimmerman
Brian Doyle (SAA Staff Liaison)

¹ http://www.ctg.albany.edu/publications/guides/conducting_best/conducting_best.pdf

Introduction

In February 2005, the SAA Council embarked on a strategic planning initiative that began with identifying a “radar screen” of 10 to 12 challenges to the archives profession—disruptive forces that will likely have a significant impact on the Society’s mission and that could be harmful if not addressed. Council members narrowed that list to the three highest priorities, defined desired outcomes for each, and developed lists of concrete activities to achieve those desired outcomes. With the assistance of member feedback, successive Councils have repeatedly reexamined and reaffirmed the significance of these three highest priorities: Technology, Diversity, and Public Awareness/Advocacy.

As expressed by the Council’s issue statement, “rapidly changing information technologies challenge archival principles, practices, and communication protocols, demanding effective leadership from the archives community to access, capture, and preserve records in all formats.” When SAA and the archival profession successfully come to terms with this challenge, the following desired outcomes will be achieved:

1. All archivists will possess recognized core competencies on how to manage, appraise, acquire, and provide access to electronic records and other digital assets.
2. Archivists will be able to communicate and collaborate with information technologists and members of allied professions at a basic level.
3. Some archivists will have advanced knowledge of electronic records and digital asset management techniques so that they can serve as a source of expert knowledge, conduct research, and anticipate changes in technology so that the profession is better prepared to respond.
4. Archivists, records managers, and IT professionals will develop, accept, and implement widely accepted standards for archival functions (e.g., accessioning, appraisal, arrangement and description, preservation, access) for born-digital records and digitized archival assets utilizing readily available tools.
5. Archivists will have a variety of educational opportunities to acquire and improve electronic records-related competencies at the introductory, advanced, and continuing education levels.
6. Archivists will formulate appropriate advocacy strategies based upon a sophisticated understanding of the role of information policy in the creation and accessibility of records.

In 2006, when the technology issue statement and its desired outcomes outlined above were first articulated, the highest-ranking activity recommended by the Council was to “identify competencies and standards and collect, review, and clarify best practices relating to all areas of archival practice that are affected by electronic records and digital asset issues.” Subsequently, the Council appointed the Technology Best Practices Task Force, which was initially charged to work with appropriate SAA groups and “compile an

annotated bibliography and/or summary report (to) post on the SAA website.” The Task Force compiled a working document, *Managing Electronic Records and Assets: A Bibliography*, as a first pass at such a compilation.

As reported in the task force’s August 2007 and February 2008 progress reports, the working document was put out for comment. Feedback on the bibliography was critical of its scope and the lack of satisfactory criteria by which to define and identify “best practices.” Consequently, the task force revisited and refined its methodology. As the task force May 2008 progress report stated:

Applied research in the professions often takes place without the academic rigor of method, especially when it comes to measuring and testing outcomes. Most information is published because of its usefulness to professional practice and not to offer prescriptive solutions. Also, archivists believe that repository context is everything, making the generalization of solutions difficult. Determining best practices for electronic archival records may be considered suspect by some.

On this basis, the task force identified four criteria for best practices research. As outlined in the May 2008 progress report, best practices:

1. Present innovative and creative solutions to common problems;
2. Are sustainable;
3. Have the potential for replication; and
4. Provide at least some empirical evidence for the above.

To test the new methodology, the task force sought to apply these criteria to a more focused “pilot study” on the management of email records. The pilot study was very time-consuming and revealed few practices that met the definition above.

The task force then reviewed the draft working bibliography for entries that would meet the four criteria for best practices. As the task force’s final report (February 2009; see Appendix) concluded:

We have adopted a definition of best practices and criteria for recognizing them, and we do not believe that there is yet a body of best practices out there that would meet those criteria. As potential best practices emerge, specialists will be needed to evaluate whether there is empirical evidence that the practices provide innovative solutions to common problems.

These findings underscore the veracity of the SAA Council’s issue statement on technology and the urgency for “effective leadership from the archives community to access, capture, and preserve records in all formats.” The Task Force’s final report is presented here with the bibliography as an appendix, not as prescriptive solutions but rather as a resource that will help with the identification of best practices as they emerge.

**Society of American Archivists
Council Meeting
February 26 – 28, 2009
Washington, DC**

Final Report: Technology Best Practices Task Force
(Prepared by Task Force Chair Naomi Nelson)

Current Task Force Membership

- Naomi Nelson, Emory University (chair)
- Mark Conrad, Electronic Records Archives Program, NARA
- Pam Duane, Madison Gas and Electric (ARMA)
- Nancy Lenoil, California State Archives
- Rob Spindler, Arizona State University
- Carla Summers, Archives and Special Collections Consulting
- Brian Doyle, SAA Staff Liaison

BACKGROUND

Task Force Charge (September 2006): To develop an inventory of best practices and standards for implementation that are based on practical knowledge rather than theory. For all materials with which practicing archivists in smaller shops are dealing (both born-digital and digitized).²

DISCUSSION

Summary

The task force feels that it has gone as far as it can, given 1) the breadth of the charge and 2) the current state of best practices for technologies related to archives. We have adopted a definition of best practices and criteria for recognizing them, and we do not believe that there is yet a body of best practices out there that would meet those criteria. As potential best practices emerge, specialists will be needed to evaluate whether there is empirical evidence that the practices provide innovative solutions to common problems. We propose that the work of identifying best practices related to technology become a part of the charge of the Standards Committee, which can then use working groups of specialists to evaluate potential best practices as they emerge.

² Staff Note: The Task Force charge, per Elizabeth Adkins's charge in September 2006, was as follows: "Work with appropriate SAA groups to identify competencies and standards and to collect, review, and clarify best practices relating to all areas of archival practice that are affected by electronic records and digital asset issues. Compile an annotated bibliography and/or summary report and post on the SAA website." Staff is not aware of any Council-directed change in that charge.

The Breadth of the Charge

The task force has struggled with the breadth of the charge. It covers all forms of electronic records and digital assets (both born-digital and digitized) and all forms of electronic records and digital asset management. It also initially included standards. This is simply too much territory for a task force to cover well.

The charge also did not define “best practices,” and we discovered that this term means very different things to different constituencies within SAA (including, initially, within the task force). We have adopted some definitions that clarify what we mean by best practices and some criteria with which to evaluate whether a given practice meets that definition. We assert that any practices promulgated by SAA as “best practices” must meet this kind of more rigorous definition because 1) they will appear under SAA’s brand (and therefore be understood to be authoritative) and 2) the archivists most likely to use a compilation of best practices are also most likely least able to evaluate whether the practice has a proven track record. Feedback from the Electronic Records Section strongly reinforced these points.

Current State of Best Practices

We surveyed the websites of institutions and organizations, SAA instructional materials, reports to granting agencies, some laws and policies, and bibliographic databases looking for practices that would give us a place to start. We found some standards, many reports on projects, some policies, and a few practices. In most cases, organizations have not made their practices publicly available. We feel that best practices simply have not emerged yet in most areas of electronic records and digital asset management.

Need for Specialists

We piloted the criteria and process we had adopted to see how labor-intensive it would be. We were most interested in testing the methodology, so we decided to use low-hanging fruit—the easily available e-mail policies for states, nations, and organizations. (We recognize that these policies are not practices, but there isn’t a similar body of practices available for electronic records and digital assets.) We were able to identify parts of the policies listed by four or more organizations (indicating replication), but the work was very time-consuming and would be hard to sustain for a single task force. We then consulted experts identified by task force members to determine whether the results were useful. The feedback indicated that information about common policies would be useful to policymakers and that further input from experts would be needed to weed out policies that may be common but are not in fact “best policies.” In other words, the results would be useful to experts but might mislead those new to the subject.

We had initially hoped that graduate students might help with the work of identification of best practices (using the criteria). Our experience with the pilot indicated that the expertise needed both to identify individual practices and to determine that they are “optimal and efficient” would make it difficult for graduate students to do this work. In

addition, the Standards Committee shared their experience that using graduate students to help compile lists of relevant standards was too labor-intensive to be sustainable, and we feel that best practices will be more difficult to compile than standards.

RECOMMENDATION:

THAT the SAA Council ask the Chair of the Standards Committee to create working groups to identify common practices and best practices in focused areas of electronic records and digital asset management;

THAT the membership of a particular working group would consist of practitioners working within the areas of electronic records and digital assets assigned to that working group;

THAT sections, roundtables, and individual members be solicited by the working groups for emerging common practices; and

THAT the results of the working groups' investigations be made public through the Standards Committee's website or portal.

Support Statement: Very few archivists are engaging in any kind of practice when it comes to electronic records.³ Because few archivists are working with electronic records, best practices are not being developed. This recommendation seeks to “institutionalize” a process for best practices development.

At the SAA Annual Meeting, the task force chair briefed the Standards Committee on the conclusions outlined above and met with Nancy Kunde and Aprille McKay from the Standards Committee in a separate meeting to brainstorm. The Standards Committee is struggling with some of the same issues relating to the labor of identifying and evaluating standards. We discussed whether the work of identifying best practices might logically belong within the Standards Committee, and there was some initial agreement that it did.

Fiscal Impact: None.

³ See Susan E. Davis, “Electronic Records Planning in ‘Collecting’ Repositories,” *American Archivist*, Volume 71, Number 1 / Spring - Summer 2008, pp. 167-189, and Marcia Frank Peri and Lisl Zach, “Determining Current Practices for College and University Electronic Records Management Programs,” available at <http://www.ils.unc.edu/nhprcfellows/conf2006/zachperi.ppt>. Accessed 14 January 2009.

Appendix 1

The Task Force recommends the following working paper on best practices research: Stephanie Myers, Hayden P. Smith, and Lawrence L. Martin, “Conducting Best Practices Research in Public Affairs, Working Paper No. 3” (November 2004), Center for Community Partnerships College of Health & Public Affairs, University of Central Florida, pg. 14, <<http://www.cohpa.ucf.edu/ccp/library/workingpaper3.pdf>> (03/07/08).

Defining Best Practices

Practice, n.

2. a. The actual application or use of an idea, belief, or method, as opposed to the theory or principles of it;

From the *Oxford English Dictionary*, Draft Revision Dec. 2007 (accessed at <http://dictionary.oed.com/entrance.dtl> on February 13, 2008)

Classification of Best Practices

- Evidenced Based Practices (EBPs) – practices supported by a substantial body of outcomes based research
 - Best Practices (BPs) – practices supported by a substantial body of research findings generally acknowledged as superior or state of the art
 - Emerging Practices (EPs) – practices believed by at least some knowledgeable professionals or professional groups to represent superior approaches
- From Stephanie Myers, Hayden P. Smith, and Lawrence L. Martin, “Conducting Best Practices Research in Public Affairs, Working Paper No. 3” (November 2004), Center for Community Partnerships College of Health & Public Affairs, University of Central Florida, pg. 14, <<http://www.cohpa.ucf.edu/ccp/library/workingpaper3.pdf>> (03/07/08).

Criteria for Identifying Best Practices

Criteria:

The task force has combined Bendixsen & de Guchteneire’s (2003) and Bretschneider, Marc-Aurele, & Wu’s (2001) criteria for best practices research. We are looking for practices that

- present innovative and creative solutions to common problems
 - are sustainable
 - have the potential for replication
 - provide at least some empirical evidence for the above
- Bendixsen, S. & de Guchteneire, P. (2003), “Best Practices in Immigration Services,” *Journal of Policy Analysis and Management*, 22(4), 677-682. Bretschneider, S. Marc-Aurele, F. & J. Wu (2001), *Best Practices Research: A Methodological Guide for the Perplexed*, <<http://www.maxwell.syr.edu/ctip/Working%20Papers/0101/A%20Guide%20...>> (08/16/04). Both cited in Stephanie Myers, Hayden P. Smith, and Lawrence L. Martin, “Conducting Best Practices Research in Public Affairs, Working Paper No. 3” (November 2004), Center for Community Partnerships College of Health & Public Affairs, University of Central Florida, pg. 14, <<http://www.cohpa.ucf.edu/ccp/library/workingpaper3.pdf>> (03/07/08).

Appendix 2

Results of the Methodology Pilot

We reviewed the email policies of the following repositories, broke them down into individual policy elements, and compiled the policies common to at least 4 entities:

Alabama	Massachusetts	Texas
Alaska	Michigan	Utah
Arizona	Minnesota	Virginia
Arkansas	Mississippi	Washington
California	Missouri	West Virginia
Colorado	Montana	Wisconsin
Connecticut	Nebraska	Wyoming
Delaware	Nevada	
Florida	New Jersey	Australia
Georgia	New Mexico	South Africa
Idaho	New York	United Kingdom
Indiana	North Carolina	United States (NARA)
Kansas	Ohio	
Kentucky	Oregon	Smithsonian Institution
Louisiana	Pennsylvania	Archives (SIA)
Maine	South Carolina	
Maryland	Tennessee	

We sent the results to the following individuals and organizations and received feedback from 44% of them:

- NAGARA
- SAA's Electronic Record Section
- ARMA's Standards Committee
- CoSA
- Mark Myers (Kentucky)
- Drucie Simpson (North Carolina)
- Rick Ferrante (Smithsonian Institution)
- Caryn Wojcik (Michigan)
- Diane Palmer (NARA)

The following is representative of the feedback we received:

- In addition to the guidance that [institution] Records Management staff provides to [institution] employees and contractors, I can use this report as supplemental resource material when training staff about e-mail records management. Specifically, I can use the report in comparing my institution's e-mail records management practices and policies with various states and international institutions' practices and policies. When staff learns how other institutions manage e-mail records, especially where

there are differences, this type of information helps to stimulate discussion about basic e-mail management policy and practices.

- I think this may be helpful to archivists and records managers who are writing or revising their e-mail policies/guidelines. However, it is very government-oriented, and a lot of SAA members don't work in government. I think this needs more perspective from corporate and university archivists. Also, the section on Recordkeeping System Requirements may need to be broken down a bit, it covers quite a lot. [Note: The Business Records Section leadership reported that businesses will not release their e-mail policies due to issues of risk exposure.]
- E-mail management practices have been the subject of intense interest in [state] over the past three months since our state passed a new open records law last spring which becomes effective January 1. ... In this context, the document you have compiled is useful. I would say the areas covered and the practices outlined generally correspond with the policies we are developing. The one central concept we have been working on which is less specifically addressed in your statement is transitory records (called information and reference records in your document). We have struggled with the determination of when specific retention and disposition schedules apply with fixed time frames for deletion, and when the individual sender or recipient of an e-mail may delete a message because it is no longer needed. I believe this was an issue of some contention in the discussions this summer in [another state] as well. Training staff to all be records managers with regard to their own e-mail is a significant issue which might be addressed as another category in your outline. We have a new online training module for e-mail management being required of all state employees. Otherwise I would conclude that your categorization of the issues and the topics covered are right on target with what we are doing.
- Overall, this is a helpful document, with an extra stress to the reader that these are commonalities only.

Appendix: Preliminary Bibliography

Compiled by the Task Force

Note: The task force members could not reach agreement on all the sources included in the bibliography.

1. Digital Collections

- Open Archival Information System (OAIS) Framework
- Format Recommendations
- Metadata Standards (General)
- Networks and Communities
- Selected Organizations
- Selected Best Practices, Guidelines, and Handbooks
- Selected Model Programs and Projects
- Selected Articles, Books and Reports
- Selected Journals

Open Archival Information System (OAIS) Framework

“OAIS describes all the functions of a digital repository: how digital objects can be prepared, submitted to an archive, stored for long periods, maintained, and retrieved as needed. It does not address specific technologies, archiving techniques, or types of content.” (RLG, http://www.rlg.org/en/page.php?Page_ID=3201)

OAIS Activities, RLG/OCLC, 2006

http://www.rlg.org/en/page.php?Page_ID=3201

Includes links to OAIS-modeled repositories and OAIS resources.

Reference Model for an Open Archival Information System (OAIS), Consultative Committee for Space Data Systems, January 2002

<http://public.ccsds.org/publications/archive/650x0b1.pdf>

“ The purpose of this document is to define the International Organization for Standardization (ISO) Reference Model for an Open Archival Information System (OAIS). An OAIS is an archive, consisting of an organization of people and systems, that has accepted the responsibility to preserve information and make it available for a Designated Community .”

Format Recommendations

Recommended Data Formats for Preservation Purposes in the Florida Center for Library Automation Digital Archive

<http://www.fcla.edu/digitalArchive/pdfs/recFormats.pdf>

“This table is intended to help Florida university administrators develop guidelines for preparing and submitting files to the Florida Digital Archive.” It evaluates formats for texts, raster images, vector graphics, audio, video, databases/spreadsheets, virtual reality, computer programs, and presentations.

Metadata Standards (General)

Dublin Core Metadata Initiative (DC or DCMI)

<http://dublincore.org/>

DC is a simple metadata element set intended to facilitate discovery of electronic resources.

Metadata Encoding and Transmission Standard (METS)

<http://www.loc.gov/standards/mets>

“The METS schema is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library...”

Metadata Object Description Schema (MODS)

<http://www.loc.gov/standards/mods/>

The MODS schema is a bibliographic element set intended to be able to carry selected data from existing MARC 21 records as well as to enable the creation of original resource description records.

PREservation Metadata: Implementation Strategies (PREMIS).

<http://www.oclc.org/research/projects/pmwg/>

The objectives of PREMIS were to develop a core preservation metadata set, supported by a data dictionary, with broad applicability across the digital preservation community and to identify and evaluate alternative strategies for encoding, storing, and managing preservation metadata in digital preservation systems.

Networks and Communities

SAA Metadata & Digital Object Roundtable

<http://www.archivists.org/saagroups/metadata/>

Provides a place for collaboration and a source for guidance to archivists at all types of repositories as they engage with the digital environment. The Roundtable has a listserv.

Selected Organizations

Conservation OnLine: Resources for Conservation Professionals (CoOL)

<http://palimpsest.stanford.edu/>

“CoOL, a project of the Preservation Department of Stanford University Libraries, is a full text library of conservation information, covering a wide spectrum of topics of interest to those involved with the conservation of library, archives and museum materials.” The site includes links to guidelines and for and information about digital audio and video.

Council on Library and Information Resources (CLIR)

<http://www.clir.org/>

“CLIR is an independent, nonprofit organization. Through publications, projects, and programs, CLIR works to maintain and improve access to information for generations to come. In partnership with other institutions, CLIR helps create services that expand the concept of "library" and supports the providers and preservers of information.”

Cover Pages

<http://xml.coverpages.org/>

“The Cover Pages is a comprehensive, online reference collection supporting the XML family of markup language standards, XML vocabularies, and related structured information standards. Edited by Robin Cover since 1986, this public access knowledgebase promotes and enables the use of open, interoperable, standards-based solutions which protect digital information and enhance the quality of data processing.”

Digital Library Federation (DLF)

<http://www.diglib.org/>

“The DLF is a consortium of libraries and related agencies that are pioneering the use of electronic-information technologies to extend collections and services.”

Online Computer Library Center (OCLC)

<http://www.oclc.org/services/preservation/default.htm>

“OCLC is a nonprofit, membership, computer library service and research organization dedicated to the public purposes of furthering access to the world's information and reducing information costs.”

Research Libraries Group (RLG)

<http://www.rlg.org/>

“RLG supports researchers and learners worldwide by expanding access to research materials held in libraries, archives, and museums. RLG works with and for its member organizations enhancing their ability to provide research resources. RLG designs and delivers innovative information discovery services, organizes collaborative programs, and takes an active role in creating and promoting relevant standards and practices.”

Technical Advisory Service for Images (TASI)

<http://www.tasi.ac.uk/index.html>

The Technical Advisory Service for Images is a JISC funded service. It provides advice and guidance to the UK's Further and Higher Education community on the issues of: creating digital images; delivering digital images to users; using digital images to support

teaching, learning and research; and managing both small and large scale digitisation projects.

Selected Best Practices, Guidelines, and Handbooks

Basic Genre Terms for Cultural Heritage Materials, American Memory, Library of Congress

<http://memory.loc.gov/ammem/techdocs/genre.html>

This basic list of genre terms has been compiled to facilitate the American Memory descriptive record normalization project.

Digital Preservation Management: Implementing Short-term Strategies for Long-term Problems, Cornell University Library, 2003

<http://www.library.cornell.edu/iris/tutorial/dpm/>

A Framework of Guidelines for Building Good Digital Collections, National Information Standards Organization, 2004

<http://www.niso.org/framework/Framework2.html>

Conservation Implications of Digitization Projects, Library of Congress NDLP and the Conservation Division, 1999

<http://memory.loc.gov/ammem/techdocs/conservation.html>

Handbook for Digital Projects: A Management Tool for Preservation and Access, Northeast Document Conservation Center, 2000

<http://nedcc.org/oldnedccsite/digital/dighome.htm>

Library of Congress: Building Digital Collections: A Technical Overview

<http://memory.loc.gov/ammem/about/techIn.html>

“The American Memory historical collections at the Library of Congress are the product of a permanent commitment to explore and establish the best practices of digitization, online presentation and access, and digital preservation of historical materials. The information on this page documents current solutions to technical challenges and solutions devised and implemented in the past. The page is updated and expanded periodically.”

The NINCH Guide to Good Practice in the Digital Representation and Management of Cultural Heritage Materials, Humanities Advanced Technology and Information Institute (HATII), University of Glasgow, and the National Initiative for a Networked Cultural Heritage (NINCH), October 2002

<http://www.nyu.edu/its/humanities/ninchguide/>

Recommendations for the Evaluation of Digital Images Produced from Photographic, Microphotographic, and Various Paper Formats, American Memory, Library of Congress.

<http://memory.loc.gov/ammem/ipirpt.html>

The National Digital Library Program contracted with the Image Permanence Institute (IPI) in Rochester New York, to produce a report providing recommendations for methods to evaluate the performance and products of scanning service providers. These

methods include the use of standard "targets" and a description of the tools and devices needed to measure image quality.

Sitts, Maxine K., editor, **Handbook for Digital Projects: A Management Tool for Preservation and Access**, Andover, Mass.: Northeast Document Conservation Center, 2000.

Selected Model Programs and Projects

Aluka

<http://www.aluka.org/>

"... not-for-profit initiative partnering with key libraries, museums, and archives around the globe to build a sustainable digital library of curated collections from and about the developing world, focusing, to begin with, on Africa"

Collaborative Digitization Program

<http://www.cdpheritage.org/index.cfm>

The CDP endeavors to provide meaningful content on human culture, science, and art to everyone connected online. The site both provides access to information about American culture and contains information about providing online access to historic collections. The CDP is based on a model of distributed images and centralized metadata. Guidelines include:

- Project Management (including questions to ask before starting and funding sources) <http://www.cdpheritage.org/digital/index.cfm>
- CDP Collection policy, May 2006
<http://www.cdpheritage.org/cdp/documents/CDPCollectionPolicyMay2006.pdf>
- CDP Digital Image Storage Policy, July 2001
http://www.cdpheritage.org/cdp/documents/policy_imagestorage_2001.pdf
- Western States Digital Standards Group, Western States Digital Imaging Best Practices, Version 1.0, January 2003.
http://www.cdpheritage.org/digital/scanning/documents/WSDIBP_v1.pdf. (For the quick reference see <http://www.cdpheritage.org/digital/scanning/quickRef.cfm>.)
- CDP Dublin Core Metadata Best Practices, Version 2.1.1, September 2006.
<http://www.cdpheritage.org/cdp/documents/CDPDCMBP.pdf>
- CDP Digital Audio Best Practices, Version 2.0, November 2005.
http://www.cdpheritage.org/digital/audio/documents/CDPDABP_1-2.pdf
- DC Builder: a tool that allows institutions to directly input and edit Dublin Core records using a web-based interface. Administrators can also crosswalk and batch load non-Dublin Core records, such as MARC records, museum collection management databases, and other local database formats.
<http://www.cdpheritage.org/digital/dcBuilder.cfm>
- Rocky Mountain Online Archive, EAD Outsourcing Guide, Version 1.0, May 2005. <http://www.cdpheritage.org/project/rmoa/outsourcingGuide.cfm>
- A Sound Model: Collaborative Infrastructure for Digital Audio. This project will create a shared infrastructure that enables museums, libraries and archives to

provide access to digitized oral history audio recordings and related transcripts.
<http://www.cdphheritage.org/project/soundmodel/index.cfm>

Electronic Resource Preservation and Access Network (ERPANET)

<http://www.erpanet.org>

The European Commission funded the ERPANET Project to establish an expandable European Consortium, which will make viable and visible information, best practice and skills development in the area of digital preservation of cultural heritage and scientific objects. The site includes the following guidance documents:

- Ingest Strategies, September 2004: This guidance document is intended to introduce ingest and its role in the development of a digital repository system. The appendix contains a companion guide and checklist when defining and/or selecting an ingest strategy, presenting a survey of the factors required for consideration. <http://www.erpanet.org/guidance/docs/ERPANETIngestTool.pdf>
- Selecting Technologies, September 2003: This document outlines factors that should be considered when choosing technologies for digital libraries.
http://www.erpanet.org/guidance/docs/ERPANETSelect_Techno.pdf

North Carolina Exploring Cultural Heritage Online (NC ECHO)

<http://www.ncecho.org>

NCECHO promotes the use of digital technologies to broaden and enhance access to North Carolina's cultural heritage.

- Digitization Guidelines: <http://www.ncecho.org/guidelines.asp>
- NC ECHO Dublin Core Implementation Guidelines.
<http://www.ncecho.org/ncdc/ncdublincore.htm>
- NC ECHO Preservation Metadata for Digital Objects (PMDO).
<http://www.ncecho.org/presmet/index.htm>

Public Records Office (UK)

<http://www.nationalarchives.gov.uk/electronicrecords/advice/default.htm>

The PRO provides access to electronic records toolkits through its website. The toolkits include:

- How to produce a corporate policy on electronic records
- Toolkit for compiling an inventory of electronic record collections
- Toolkit for appraising the inventory of electronic records
- Sustainable electronic records: strategies for the maintenance and preservation
- Management of electronic records on websites and intranets: an ERM toolkit
- Guidelines on developing a policy for managing email

Washington State Library Digital Best Practices

<http://digitalwa.statelibrary.wa.gov/newsite/best.htm>

This site includes sections on the major decision points in planning a digital project, grouped under the following larger categories: project management, collection,

technology, and funding. In addition, users can follow a single scenario tracing a community-based, collaborative digital project or read reports on digital projects done by Washington State libraries.

Selected Articles, Books and Reports

Arms, Caroline R., "Available and Useful: OAI at the Library of Congress," [Library Hi Tech](#), Volume 21, No. 2, 2003, pp. 129-139.

"Describes Library of Congress experience as an early adopter of the OAI Protocol for Metadata Harvesting."

Beagrie, Neil, and Daniel Greenstein, "A Strategic Policy Framework for Creating and Preserving Digital Collections," Arts and Humanities Data Service.
<http://ahds.ac.uk/manage/framework.htm>

Rayward, W. Boyd, "Electronic Information and the Functional Integration of Libraries, Museums and Archives," *History and Electronic Artefacts*, ed. Edward Higgs, ed., Oxford University Press, 1998, pg. 207-226.

Vitale, Timothy, "Light Levels Used in Modern Flatbed Scanners," *RLG DigiNews*, Vol. 2, No. 5, October 15, 1998.

<http://www.rlg.org/preserv/diginews/diginews2-5.html#technical>

Selected Journals

D-Lib Magazine, <http://www.dlib.org/>

Microform and Imaging Review, Munich, Germany : K.G. Saur.

RLG DigiNews, <http://www.rlg.org/preserv/diginews/>

2. Digital Audio and Video

- Format Standards
- Metadata Standards for Audio and Video Recordings
- Selected Best Practices, Guidelines, and Handbooks
- Selected Articles, Books and Reports

Format Standards

See the Library of Congress' Digital Formats Web site for specifications and the sustainability of various formats.

<http://digitalpreservation.gov/formats/content/video.shtml>

Planning for Library of Congress Collections: Sustainability of Digital Formats

<http://digitalpreservation.gov/formats/content/sound.shtml> (sound)

<http://digitalpreservation.gov/formats/content/video.shtml> (video)

Waveform Data (WAV)

<http://ccrma.stanford.edu/courses/422/projects/WaveFormat/>

The WAVE file format is a subset of Microsoft's RIFF specification for the storage of multimedia files.

Metadata Standards for Audio and Video Recordings

Audio Technical Metadata Extension Schema (AMD)

Data Dictionary: http://www.loc.gov/rr/mopic/avprot/DD_AMD.html

Schema: <http://lcweb2.loc.gov/mets/Schemas/AMD.xsd>

AMD is a set of technical data elements required to manage digital audio files.

Video Technical Metadata Extension Schema (VMD)

Data Dictionary: http://www.loc.gov/rr/mopic/avprot/DD_VMD.html

Schema: <http://lcweb2.loc.gov/mets/Schemas/VMD.xsd>

VMD is a set of technical data elements required to manage digital video files.

Selected Best Practices, Guidelines, and Handbooks

Capturing Analog Sound for Digital Preservation: Report of a Roundtable

Discussion of Best Practices for Transferring Analog Discs and Tapes, Council on Library and Information Resources and Library of Congress, March 2006

<http://www.clir.org/pubs/reports/pub137/pub137.pdf>

Digital Audio Best Practices, Version 2.0, Collaborative Digitization Program, Digital Audio Working Group, November 2005

http://www.cdpheritage.org/digital/audio/documents/CDPDABP_1-2.pdf

Digital Audio-Visual Preservation Prototyping Projects, American Memory, Library of Congress

<http://www.loc.gov/rr/mopic/avprot/avprhome.html>

“The Library of Congress Motion Picture, Broadcasting, and Recorded Sound Division is carrying out a family of prototyping projects pertaining to the digital preservation of recorded sound, video, and film collections. The prototyping projects are developing approaches for the digital reformatting of moving image and recorded sound collections as well as studying issues related to ‘born-digital’ audio-visual content.” They are also doing a “thorough examination of digital-object packaging and METS metadata.”

Fells, Nick, Pauline Donachy, and Catherine Owen, *Creating Digital Audio Resources: A Guide to Good Practice*, Oxford: Oxbow Press, 2002.

Selected Articles, Books and Reports

Sound Savings: Preserving Audio Collections: Proceedings from the Symposium, July 24-26, 2003, Association of Research Libraries, December 2003

http://www.arl.org/preserv/sound_savings_proceedings/

3. Digital Images

- Glossaries
- Format Standards
- Metadata Standards for Images
- Networks and Communities
- Organizations
- Selected Best Practices, Guidelines, and Handbooks

Glossaries

Glossary of Image Terminology and Acronyms (from TASI)

http://www.tasi.ac.uk/glossary/images_glossary.html

Format Standards

Planning for Library of Congress Collections: Sustainability of Digital Formats

<http://digitalpreservation.gov/formats/content/still.shtml>

Graphics Interchange Format (GIF), Portable Network Graphics (PNG), W3C, 2003

<http://www.w3.org/QA/Tips/png-gif>

GIF and PNG are the two main choices of graphic format that can be used on the Web to represent simple graphics, schemas or logos.

Joint Photographic Experts Group (JPEG)

- **JPEG File Interchange Format Version (JPEG JFIF)**

<http://www.w3.org/Graphics/JPEG/>

JPEG is a lossy compression method standardised by ISO JPEG JFIF, (what people generally mean when they refer to "JPEG"), is a file format created by the Independent JPEG Group (IJG) for the transport of single JPEG-compressed images.

- **JPEG2000**

<http://www.jpeg.org/jpeg2000/index.html>

JPEG2000 is a new image coding system that uses state-of-the-art compression techniques based on wavelet technology. For more on why we should pay attention to it, see <http://www.library.yale.edu/iso/devforumdocs/JPEG2000.ppt>.

Portable Document Format (PDF), Adobe Systems, Inc.

http://partners.adobe.com/public/developer/pdf/index_reference.html.

The PDF format was designed to allow people to exchange and view electronic documents independently of the environment in which they were created.

Tagged Image File Format (TIFF) Adobe Systems, Inc.
<http://partners.adobe.com/public/developer/tiff/index.html>
TIFF is a popular public domain raster file formats.

Metadata Standards for Images

Cataloging Cultural Objects (CCO)

<http://www.vraweb.org/ccoweb/cco/index.html>

“CCO provides guidelines for selecting, ordering, and formatting data used to populate catalog records. CCO is designed to promote good descriptive cataloging, shared documentation, and enhanced end-user access. A project of the Visual Resources Association.”

Metadata for Images in XML Markup (MIX)

<http://www.loc.gov/standards/mix/>

MIX is a schema for a “set of technical data elements required to manage digital image collections.” The schema is currently in draft status.

Visual Resources Association Core Categories (VRA Core)

<http://www.vraweb.org/projects/vracore4/index.html>

VRA Core is “a single element set that can be applied as many times as necessary to create records to describe *works* of visual culture as well as the *images* that document them.”

Networks and Communities

IMAGELIB Listserv

<http://www.elearn.arizona.edu/imagelib/>

“IMAGELIB is a listserv that was started in 1994 as a way for librarians and information technologists to share ideas, ask questions, and report on imaging projects. There are approximately 950 subscribers from around the world representing a variety of disciplines and professions. Their common interest is imaging. Members use the listserv to ask for advice, share release news about projects, announce job vacancies, and post information about conferences.”

SAA Visual Materials Section

<http://www.lib.lsu.edu/SAA/VMhome.html>

Archivists who administer (collect, arrange, preserve, describe and interpret) still photographs, moving images, art, and graphic materials. The Section has a listserv

SAA Visual Materials Cataloging & Access Roundtable

<http://www.lib.lsu.edu/SAA/vmcar.html>

Provides a forum for archivists with visual collections to discuss cataloging and access issues.

Organizations

Technical Advisory Service for Images (TASI)

<http://www.tasi.ac.uk/index.html>

The Technical Advisory Service for Images is a JISC funded service. It provides advice and guidance to the UK's Further and Higher Education community on the issues of: creating digital images; delivering digital images to users; using digital images to support teaching, learning and research; and managing both small and large scale digitisation projects.

Selected Best Practices, Guidelines, and Handbooks

Conversion Specifications for Contracted Scanning Services, National Digital Library Program, 1996

<http://memory.loc.gov/ammem/techdocs/conversion.html>

“NDLP Requests for Proposals for scanning and text conversion of original paper documents, microfilm, and pictorial materials.”

Guides to Quality in Visual Resource Imaging, Research Libraries Group, Digital Library Federation, Council on Library and Information Resources, July 2000,

<http://www.rlg.org/visguides/index.html>

Kenney, Anne R., Louis H. Sharpe II, et al., **Illustrated Book Study: Digital Conversion Requirements Printed Illustrations**, Preservation Directorate, Library of Congress

<http://www.loc.gov/preserv/rt/illbk/ibs.htm>

“The Cornell University Library Department of Preservation and Conservation and Picture Elements, Incorporated undertook a joint study for the Library of Congress to determine the best means for digitizing the vast array of illustrations used in 19th and early 20th century commercial publications.”

Kenney, Anne R. and Stephen Chapman, **Digital Imaging for Libraries and Archives**, Ithaca, N.Y.: Dept. of Preservation and Conservation, Cornell University Library, 1996.

Kenny, Anne R. and Oya Y. Rieger, editors and principal authors. **Moving Theory into Practice: Digital Imaging for Libraries and Archives**. Mountain View, CA: Research Libraries Group, 2000.

(See also <http://www.library.cornell.edu/preservation/tutorial/contents.html>)

Library of Congress Technical Standards for Digital Conversion of Text and Graphic Materials

<http://memory.loc.gov/ammem/about/techStandards.pdf>

The Library is currently revising a series of standards and best practices to guide the Library's digital conversion efforts. These documents detail the current digitization standards followed by the Library. (For change history, see last page.)

Technical Guidelines for Digitizing Archival Materials for Electronic Access: Creation of Production Master Files - Raster Images, National Archives and Records Administration, 2004.

<http://www.archives.gov/preservation/technical/guidelines.html>

4. Digital Texts

- Encoding Standards for Texts
- Selected Best Practices, Guidelines, and Handbooks
- Selected Articles, Books and Reports

See the **Library of Congress' Digital Formats Web** site for specifications and the sustainability of various formats.

<http://digitalpreservation.gov/formats/content/text.shtml>

Encoding Standards for Texts

Encoded Archival Description (EAD)

See the SAA EAD Roundtable website for links to standards, best practices, implementors, tools, and news.

<http://www.archivists.org/saagroups/ead/>

Model Editions Partnership (MEP)

<http://adh.sc.edu/>

The Model Editions Partnership is derived from TEI (Text Encoding Initiative) and is a DTD to be used for the preparation and interchange of electronic editions of historical documents

Text Encoding Initiative (TEI)

<http://www.tei-c.org/>

The Text Encoding Initiative is an international project to develop guidelines for the preparation and interchange of electronic texts for scholarly research.

Selected Best Practices, Guidelines, and Handbooks

American Memory DTD for Historical Documents

<http://memory.loc.gov/ammem/techdocs/amdtd.html>

The Library is converting a wide array of documents to searchable form, including books, pamphlets, broadsides, legal materials, serial articles, and manuscripts. The American Memory Document Type Definition (AMMEM.DTD) was developed to accommodate this broad range of materials by conceptualizing a generalized humanities text, rather than seeking to describe specific document types and subtypes, or text genres. The American Memory DTD is conformant with the Text Encoding Initiative (TEI).

Library of Congress Technical Standards for Digital Conversion of Text and Graphic Materials

<http://memory.loc.gov/ammem/about/techStandards.pdf>

The Library is currently revising a series of standards and best practices to guide the Library's digital conversion efforts. These documents detail the current digitization standards followed by the Library. (See last page for change history.)

Selected Articles, Books and Reports

Lundberg, Sigfrid, "St. Laurentius Digital Manuscript Library: An excursion along the border between resource discovery and resource description," NetLab, Lund University Libraries, Sweden, 2002

<http://laurentius.lub.lu.se/search/presentation/laurentius.pdf>

This paper discusses the experiences gained by the development of a service to provide access to digitized medieval manuscripts. It discusses the database used from the point of view of both retrieval of the intellectual content (the texts) of these manuscripts and of the retrieval of the manuscripts as unique entities.

5. Electronic Records

- Networks and Communities
- Standards, Guidelines and Best Practices
- Selected Articles, Books and Reports

Networks and Communities

SAA Electronic Records Section

<http://www.archivists.org/saagroups/ers/index.asp>

Persons interested in managing electronic records. The Section has a listserv.

Standards, Guidelines and Best Practices

Department of Defense 5015.02-STD, *Electronic Records Management Software Applications Design Criteria Standard*, 2007

<http://jtc.fhu.disa.mil/recmgt/standards.html>

This Standard sets forth baseline functional requirements for Records Management Application (RMA) software and describes the minimum records management requirements that must be met based on current National Archives and Records Administration (NARA) regulations.

European Commission, *Model Requirements for the Management of Electronic Records (MoReq)*, 2001

The Model Requirements is a comprehensive set of functional requirements for systems that manage electronic records. The Model Requirements are in the process of being revised and updated.

International Council on Archives, *Electronic Records: A WorkBook for Archivists*, Paris: ICA, 2005

<http://www.ica.org/en/node/30273>

This workbook includes chapters on basic concepts and definitions, on influencing recordkeeping practices, on implementing recordkeeping requirements, on long-term preservation, and on access to electronic records.

International Research on Permanent Authentic Records in Electronic Systems (InterPARES)

<http://www.interpares.org/>

InterPARES aims at developing the theoretical and methodological knowledge essential to the long-term preservation of authentic records created and/or maintained in digital form. The Project is based at the School of Library, Archival and Information Studies at the University of British Columbia, in Vancouver, British Columbia, Canada.

- InterPARES1 Project, “The Long-term Preservation of Authentic Electronic Records: Findings of the InterPARES Project,” 2001.

- o Appendix 6— How to Preserve Authentic Electronic Records, http://www.interpares.org/book/interpares_book_o_app06.pdf
- o Appendix 7— Walkthrough Applying the "Preserve Electronic Records" Model, http://www.interpares.org/book/interpares_book_p_app07.pdf
- InterPARES2 Project: Products include a series of methods for reliable and accurate record making, authentic record keeping, appraisal and disposition, and authentic preservation; a register of existing metadata schemas; two models of preservation; a terminology database; and fifty case studies. http://www.interpares.org/ip2/ip2_products.cfm

International Standards Organization (ISO), *International Standard 15489 -*

Information and Documentation-Records Management, Geneva: ISO, 2001.

ISO 15489 comprises two parts: AS ISO 15489.1 Records Management - Part 1: General, and AS ISO 15489.2 Records Management - Part 2: Guidelines. Part 1 provides a high-level statement of principles and policy. Part 2 is a supplementary technical report that provides additional detail and guidance to help organizations implement the principles outlined in Part 1. Taken as whole, the Standard provides a set of requirements and practices that will assist archivists and record managers in designing recordkeeping systems.

Minnesota Historical Society, *Electronic Records Management Guidelines*

<http://www.mnhs.org/preserve/records/electronicrecords/erguidelines.html>

These guidelines provide information on a variety of topics, such as file formats and file naming, electronic records management strategies, electronic document management systems, digital media, storage facilities and procedures, e-mail and web content management, and electronic and digital signatures.

National Archives of Australia, *Dirks: A Strategic Approach to Managing Business Information*

<http://www.naa.gov.au/recordkeeping/dirks/summary.html>

The DIRKS methodology is described as “an eight-step process for agencies to use to improve their recordkeeping and information management practices, including the design and implementation of new recordkeeping systems.”

National Archives of Australia, *e-permanence made easy: A Manager's Guide to the Strategic Management of Records and Information*

<http://www.naa.gov.au/recordkeeping/overview/summary.html>

This guide provides information to assist managers in understanding and accessing the National Archives tools and resources needed to manage records and information assets in accordance with best practice standards and legal requirements.

National Archives of Australia, *Recordkeeping Metadata Standard for Commonwealth Agencies*

<http://www.naa.gov.au/recordkeeping/control/rkms/summary.htm>

This standard describes the metadata that the National Archives of Australia recommends should be captured in the recordkeeping systems used by Commonwealth government agencies. The Recordkeeping Metadata Standard consists of 20 elements, eight of which

are mandatory and 12 optional. In addition, many of these elements comprise a number of sub-elements, some mandatory and some optional. There are a total of 65 sub-elements.

National Archives of the United Kingdom

<http://www.nationalarchives.gov.uk/electronicrecords/>

The National Archives of the UK provides the following guidelines: a policy framework for electronic records management; functional requirements for electronic records management systems; guidelines on the management, appraisal and preservation of electronic records; a set of practical electronic records toolkits to help organizations develop electronic documents and records management; generic requirements for sustaining electronic information over time; and strategies for the custody of electronic records, including the articulation of a “Seamless Flow” program which automates the process of transferring electronic government records to The National Archives.

State Archives of Victoria, Management of Electronic Records PROS 99/007 (Version 2), *The Victorian Electronic Records Strategy (VERS)*

<http://www.prov.vic.gov.au/vers/standard/version2.htm>

The Standard for the Management of Electronic Records (PROS 99/007) includes five technical specifications: Specification 1: System Requirements for Preserving Electronic Records; Specification 2: VERS Metadata Scheme; Specification 3: VERS Standard Electronic Record Format; Specification 4: VERS Long Term Preservation Formats; Specification 5: Export of Electronic Records.

Selected Articles, Books and Reports

Bantin, Philip, “Strategies for Managing Electronic Records: A New Archival Paradigm? An Affirmation of Our Archival Traditions?” *Archival Issues*, Vol. 23, No. 1 (1998): 17-34.

Bearman, David, “Recordkeeping Systems,” in *Electronic Evidence*, Pittsburgh: Archives and Museum Informatics, 1994: 34-70.

http://www.archimuse.com/publishing/electronic_evidence/ElectronicEvidence.Ch2.pdf

Cook, Terry, “Electronic Records, Paper Minds: The Revolution in Information Management and Archives in the Post-Custodial and Post-Modernist Era,” *Archives and Manuscripts*, Vol. 22 (November 1994).

Cook, Terry, “What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift,” *Archivaria*, Vol. 43 (Spring 1997): 17-63.

Cunningham, Adrian, “Collecting Archives in the Next Millenium,” presented to the Australian Society of Archivists Annual Conference, Adelaide, July 1997

<http://www.nla.gov.au/nla/staffpaper/acunning7.html>

Cunningham, Adrian, “Ensuring Essential Evidence - Changing Archival and Records Management Practices in the Electronic Recordkeeping Era,” *Provenance the Web Magazine*, Vol.2, No.2, Spring 1997

<http://www.netpac.com/provenance/vol2no2/features/evidence.htm>

Cunningham, Adrian, "From Here to Eternity: Collecting Archives and the Need for a National Documentation Strategy," State Library of New South Wales, *LASIE: Library Automated Systems Information Exchange*, Vol. 29, No. 1, March 1998

<http://www.sl.nsw.gov.au/lasie/mar98/archives.htm>

Lee, Christopher A., "Guerilla Electronic Records Management: Lessons Learned," *Records and Information Management Report*, Vol. 18, No. 5 (2002): 1-13

http://www.ils.unc.edu/callee/guerrilla_erm_2002.pdf

Library of Congress and National Science Foundation, "Its About Time. Research Challenges in Digital Archiving and Long-Term Preservation," 2003.

May be available at <http://www.digitalpreservation.gov/>

McKemmish, Sue, "Are Records Ever Actual"

<http://www.sims.monash.edu.au/research/rcrg/publications/smcktrc.html>

McKemmish, Sue, "Yesterday, Today and Tomorrow: A Continuum of Responsibility";

<http://www.sims.monash.edu.au/research/rcrg/publications/recordscontinuum/smckp2.html>

McKemmish, Sue, Glenda Acland and Barbara Reed, "Towards a Framework for Standardising Recordkeeping Metadata: The Australian Recordkeeping Metadata Schema"

<http://www.sims.monash.edu.au/research/rcrg/publications/framework.html>

McKemmish, Sue, and Frank Upward, "Somewhere Beyond Custody"

<http://www.sims.monash.edu.au/research/rcrg/publications/somewher.html>

Reed, Barbara, "Metadata: Core record or core business?"

http://www.recordkeeping.com.au/pub_metadata.html

6. Electronic “Manuscript Collections”

- Selected Best Practices, Guidelines, and Handbooks
- Selected Articles, Books and Reports

Selected Best Practices, Guidelines, and Handbooks

Paradigm, “Workbook on Digital Private Papers,”

<http://www.paradigm.ac.uk/workbook/index.html>

"This workbook is an evolving resource based on an exemplar project underway at the academic research libraries of the Universities of Oxford and Manchester. Between January 2005 and February 2007, the Paradigm project will explore the issues involved in the long term preservation of digital private papers by using the papers of today's politicians as a testbed."

Selected Articles, Books and Reports

Arms, Caroline R., “Keeping Memory Alive: Practices for Preserving Digital Content at the National Digital Library Program of the Library of Congress,” *RLG DigiNews*, Vol. 4, No. 3 (June 15, 2000)

<http://www.rlg.org/legacy/preserv/diginews/diginews4-3.html#feature1>

Beagrie, Neil, “Plenty of Room at the Bottom? Personal Digital Libraries and Collections,” *D-Lib Magazine*, Vol. 11, No. 6 (2005)

<http://www.dlib.org/dlib/june05/beagrie/06beagrie.html>

Bentley Library, University of Michigan, “Case 1: Accessing, processing, and making available a born-digital personal records collection,” version October 25, 2006

www.bentley.umich.edu/bhl/practicum/2007/1_30/case1.pdf

Botticelli, P., “Records Appraisal in Network Organizations,” *Archivaria* 49 (200), 161-91.

Cook, Terry, “Byte-Ing Off What You Can Chew: Electronic Records Strategies for Small Archival Institutions,” *Archifacts* (2004): 1-20.

http://www.aranz.org.nz/Site/publications/papers_online/terry_cook_paper.aspx

Cook, Terry, “Who Will Do It if We Don’t?: The Cultural Mission of Archives vis-à-vis Electronic Records,” paper presented at the 1997 Society of American Archivists Conference

Cunningham, Adrian, ‘The Archival Management of Personal Records in Electronic Form: Some Suggestions’, *Archives and Manuscripts* 22:94-105 (May 1994).

Cunningham, Adrian, “Journey to the end of the night: custody and the dawning of a new era on the archival threshold,” *Archives and Manuscripts*, Vol. 24, No. 2 (1996): 312-321

Cunningham, Adrian, "Waiting for the Ghost Train: Strategies for Managing Personal Electronic Records before It Is Too Late," *Archival Issues*, Vol. 24, No. 1 (1999): 55-64. <http://www.mybestdocs.com/cunningham-waiting2.htm> (This link is to a pre-publication version of a paper that was delivered 1999 Society of American Archivists Annual Meeting . It was subsequently published, with minor editorial revisions, in *Archival Issues*.)

Electronic Information Resources and Historians: European Perspectives, ed. by Ross, S., and Higgs, E., St. Katharinen: Scripta Mercaturae Verlag, 1993

Esteva, Maria and Sue Soy, "DSpace, CyberCemeteries and Other Active Sites for Community Networking Records," School of Information, University of Texas at Austin, 2003 [PowerPoint presentation]
<http://www.gslis.utexas.edu/~ssoy/pubs/cnpanel7thannual.ppt#256,1>,

Gilliland-Swetland, Anne, "Digital Communications: Documentary Opportunities Not to Be Missed," *Archival Issues*, Vol. 20, No. 1 (1995): 39-50

Harris, Verne, "On the Back of a Tiger: Deconstructive Possibilities in 'Evidence of Me,'" *Archives and Manuscripts*, Vol. 29, No. 1 (2001): 8-21

Hedstrom, Margaret, "How do archivists make electronic archives usable and accessible?" *Archives and Manuscripts*, Vol. 26, No. 1 (May 1998): 6-22

Henry, Linda, "Schellenberg in Cyberspace," *American Archivist*, Vol. 16, No. 2 (Fall 1998): 309-327

Hodge, Gail M., "Best Practices for Digital Archiving: An Information Life Cycle Approach," *D-Lib Magazine*, Vol. 1, No. 6 (January 2006)
<http://www.dlib.org/dlib/january00/01hodge.html>

Hyry, Tom, and Rachel Onuf, "The Personality of Electronic Records: The Impact of new Information Technology on Personal Papers," *Archival Issues*, Vol. 22 (1997): 37-44

Lukesh, Susan S., "E-Mail and Potential Loss to Future Archives and Scholarship or the Dog That Didn't Bark," *First Monday*, Vol. 4, No. 9 (1999)
http://www.firstmonday.org/issues/issue4_9/lukesh/index.html

Lyman, Peter and Brewster Kahle, "Archiving Digital Cultural Artifacts: Organizing an Agenda for Action," *D-Lib Magazine*, (July-August 1998)
www.dlib.org/dlib/july98/07lyman.html.

McKemmish, Sue, 'Evidence of me', *Archives and Manuscripts*, vol. 45, (August 1996): 174-87
<http://www.mybestdocs.com/mckemmish-s-evidofme-ch10.htm> (This site reprints the article with the permission of the author and publisher.)

Michael L. Miller, "Assessing the Need: What Information and Activities Should We Preserve?" Documenting the Digital Age symposium, 1997.

Montaña, John C. "Who Owns Business Data on Personally Owned Computers?" *Information Management Journal*, Vol. 39, No. 3 (2005): 36-40, 42

O'Sullivan, Catherine. "Diaries, Online Diaries and the Future Loss to Archives; or, Blogs and the Blogging Bloggers Who Blog Them." *American Archivist*, Vol. 68, No. 1 (2005).

Onopko, Helen, "Evolving access solutions - repatriation of records to indigenous communities," presented at the Records Management Association of Australia (RMAA) 2002 National Convention, September 17, 2002.

Paquet, Lucie, "Appraisal, Acquisition and Control of Personal Electronic Records: From Myth to Reality," *Archives and Manuscripts*, Vol. 28, No. 2 (November 2000): 71-91.

Taylor, Karyn, "From Paper to Cyberspace: Changing Communication Technologies and the Implications for Personal Records Archivists," MA Thesis, University of Manitoba, 2002.

Underwood, William E., "The Presidential Electronic Records Pilot System: Results of Laboratory Experiments and Use by Archivists," Georgia Tech Research Institute, 2003. <http://perpos.gtri.gatech.edu/perpos/publications/TR2003-01.pdf>

Upward, Frank, and Sue McKemmish, "In Search of the Lost Tiger, by Way of Sainte-Beuve: Re-constructing the Possibilities in 'Evidence of Me...'," *Archives and Manuscripts*, Vol. 29, No. 1 (2001) <http://www.mybestdocs.com/mckemmish-s-upward-f-ontiger-w.htm> (This site reprints the article with the permission of the author and publisher.)

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Zanish-Belcher, Tanya, M. Christian, and C. Daly, "The age of the electronic document: the documenting challenge for academic archives," *Collection Management*, Vol. 26, No. 2, (2001): 43-56

7. Institutional Repositories

- Networks and Communities
- Selected Model Programs and Projects
- Selected Articles, Books and Reports

Networks and Communities

Scholarly Publishing and Academic Resources Coalition (SPARC), Repository Resources

<http://www.arl.org/sparc/repositories/>

"The following resources may be helpful for those interested in establishing, accessing, or just learning about online repositories, both institutional and disciplinary. SPARC's membership and mandate encourages a focus on developing institutional repositories, so many resources listed here support this direction. Resources supplied here include guides, presentation materials, and handbooks produced by SPARC and other organizations. These provide definitions and developments in the field, and point those interested to the growing number of repositories."

Selected Model Programs and Projects

JISC Repositories

- **JISC Repositories and Preservation Programme**
http://www.jisc.ac.uk/whatwedo/programmes/programme_rep_pres.aspx
"The programme is a £14m investment in Higher Education repository and digital content infrastructure. It will fund initiatives to develop the Information Environment supporting digital repositories and preservation, including cross-searching facilities across repositories; funding for institutions to develop a critical mass of content, preservation solutions and advice for the development of repositories. The programme builds on the existing JISC programmes, in particular the Digital Repository programme and the Supporting Digital Preservation and Asset Management in Institutions programme."
- **JISC Digital Repositories Programme 2005-07**
http://www.jisc.ac.uk/programme_digital_repositories.html
"The aim of the Digital Repositories programme is to bring together people and practices from across various domains (research, learning, information services, institutional policy, management and administration, records management, and so on) to ensure the maximum degree of coordination in the development of digital repositories, in terms of their technical and social (including business) aspects. The Digital Repositories programme ends in 2007. Work continues under the [Repositories and Preservation programme](#)."
- **JISC Repositories Research Team Wiki**
http://www.ukoln.ac.uk/repositories/digirep/index/Repositories_Research

"This wiki is aimed at anyone working on the [JISC Digital Repositories Programme](#) and the [JISC Repositories and Preservation Programme](#) and other experts in the field of digital repositories." It includes case studies and work flows.

- **JISC Repositories Listserv Archives**
<http://www.jiscmail.ac.uk/lists/JISC-REPOSITORIES.html>

LEarning About Digital Institutional Repositories Creating an Institutional Repository: LEADIRS

Barton, Mary R. and Margaret M. Waters, *LEarning About Digital Institutional Repositories Creating an Institutional Repository: LEADIRS Workbook*, MIT Libraries, 2004-2005.

<http://www.dspace.org/implement/leadirs.pdf>

"The Learning About Digital Institutional Repositories Seminars programme (LEADIRS) aims to describe and illustrate how to build an online institutional repository. The LEADIRS series of seminars present specialists from the UK and abroad sharing their expertise and experiences in building institutional repositories. This workbook book supplements the seminar presentations and offers practical advice as well as work sheets you can use to get started with your own repository programme. Where possible, we point you to real-world examples of planning aids or presentations used by university library teams in the UK and around the world. ... LEADIRS materials are geared toward university librarians and senior level managers whose staff are building institutional repositories."

Library and Information Technology Association (LITA), Policies and Practices of Institutional Repositories at the ALA Annual Conference, Chicago, IL, 2005.

<http://www.ala.org/ala/lita/litamembership/litaigs/emergingtechnol/programs.cfm>

This site includes a bibliography and PowerPoint presentations from five universities that have implemented institutional repositories.

Ohio State Knowledge Bank Project

"The Knowledge Bank is a digital repository that collects, stores, shares, and preserves important academic assets such as publications, reports, theses, working papers, photographs, and learning objects. The project received funding from a Board of Regent's Research Grant in 2003. The project is also helping support the development of the Expertise System for collecting and sharing expertise information about University faculty and staff."

- Branin, Joseph, "Institutional Repositories," 2003, <http://hdl.handle.net/1811/441>
- Rogers, Sally A., "Developing an Institutional Knowledge Bank at Ohio State University: From Concept to Action Plan," January 1, 2003, <http://hdl.handle.net/1811/188>
- Branin, Joseph J., Rogers, Sally A., Cetwinski, Thomas, "The Ohio State Knowledge Bank Project Progress Report," July 2005, <http://hdl.handle.net/1811/565>
- Rogers, Sally A. "Developing an Institutional Knowledge Bank at Ohio State University: From Concept to Action Plan," 2003, <http://hdl.handle.net/1811/188>

- Rogers, Sally A., New Technologies, Tools, Services, and Competencies for Knowledge Managers, Association of College and Research Libraries, Preconference (2007), [PowerPoint], <http://hdl.handle.net/1811/24759>

Queen University, QSpace

<http://library.queensu.ca/webir/planning/qspace.htm>

The repository was built using DSpace. The site includes planning documents, policies, and guidelines.

University of Rochester, UR Research

"The UR Research system was built using DSpace.... An early adopter of the software, the University of Rochester is one of the original six research universities that worked with MIT and the University of Cambridge as part of the DSpace Federation."

- Information about the repository at the University of Rochester (including policies and guidelines). <https://urresearch.rochester.edu/index.jsp> (click on "About UR Research" at the bottom of the page)
- Institutional Bibliography (focusing on DSPACE). <http://docushare.lib.rochester.edu/docushare/dsweb/Get/Document-19824/IR%20bibliography.pdf>

University of Pennsylvania, ScholarlyCommons@Penn

<http://repository.upenn.edu/>

"ScholarlyCommons@Penn is a repository for the scholarly output of researchers at the University of Pennsylvania. It promotes dissemination of their work, and preserves it in a freely-accessible, long-term archive." This webpage includes links to the mission and background for the ScholarlyCommons@Penn and to the repository's policies.

Selected Articles, Books and Reports

Baudoin, Patsy, "Implementing an Institutional Repository: The DSpace Experience at MIT," *Science and Technology Libraries* 24:1 and 2 (2004): 31-45.

Bicknese, Douglas, "Institutional Repositories and the Institution's Repository: What is the Role of University Archives with an Institution's On-line Digital Repository?" *Archival Issues. Journal of the Midwest Archives Conference*, 28:2 (2003-2004): 81-93.

Crow, Raym. "The Case for Institutional Repositories: A SPARC Position Paper." *ARL Bimonthly Report* 223 (August 2002).
<http://www.arl.org/bm~doc/instrepo.pdf>

Gherman, Paul M., "Collecting at the Edge—Transforming Scholarship," co-published simultaneously in *Journal of Library Administration*, Vol. 42, No. 2, (2005): 23-34; and *Collection Management and Strategic Access to Digital Resources: The New Challenges for Research Libraries*, ed. by Sul H. Lee, (2005): 23-34

"Libraries are the repositories of the scholarly record; however, few of our efforts are directed toward building unique collections outside of special collections and archives.

As cultural heritage institutions, it is time to consider changing our role in the scholarly communication process by shifting our collection development emphasis away from traditional collections towards more up-stream materials—such as institutional repositories and edge collections. Through combined efforts at Vanderbilt University, three such collections have been created."

Gibbons, S., "Establishing an Institutional Repository," *Library Technology Reports*, Vol. 40, No. 4, (2004)

This Library Technology Report guides you through the process of establishing an institutional repository at your organization, from conceptualization to actualization, encompassing both the technology and intangibles. This report answers the basic, yet complex, questions of what an institutional repository is and why one might be of value to your organization. The report also discusses specific policy, use, and technical decisions that will result in a detailed checklist of functions and features of the ideal institutional repository system for your organization. Chapter 7 gives an overview of the currently available institutional repository systems, both commercial and open source, against which you can compare your customized checklist. This report provides enough information to enable you to be informed in your decisions as to whether an institutional repository is appropriate for your organization, how it potentially may be used, and which of the available systems best fit your needs.

Johnston, Leslie, "An Overview of digital library repository development at the University of Virginia," *OCLC Systems and Services*, Vol. 20, No.4, (2004): 170-173.
<http://www.emeraldinsight.com/Insight/ViewContentServlet?Filename=Published/EmeraldFullTextArticle/Articles/1640200408.html>

"The UVa Library is actively developing a digital library repository based on the Fedora open source architecture; the first production release was set to launch in August 2004. The Library is simultaneously testing an implementation of OpenURL and metasearch tools. This article presents the UVa Library's development process in the context of its larger digital library development efforts, including local content production, the implementation of new digital services, and the integration of those services into a unified interface."

Lynch, Clifford, Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age, *ARL: A Bimonthly Report*, no. 226 (February 2003).
<http://www.arl.org/resources/pubs/br/br226/br226ir.shtml>

McDonald, Robert H., and Chuck Thomas, "Building a FSU Digital Institutional Repository: A Vision Statement" (April 16, 2003) *Florida State University D-Scholarship Repository*, Article #1
<http://dscholarship.lib.fsu.edu/general/1>

Peters, Thomas A., "Digital Repositories: Individual, Discipline-Based, Institutional, Consortial, or National?" *Journal of Academic Librarianship* 28:6 (2002): 414-417.

Swanepoel, Marinus, "Digital Repositories: All Hype and No Substance?" *New Review of Information Networking*, Vol. 11, Issue 1, (May 2005): 13-25

Thomas, Charles F.; McDonald, Robert H.; Smith, Anthony D.; Walters, Tyler O. *New Review of Information Networking*, Vol. 11, Issue 1, (May 2005): 65-82

8. Copyright

CLIR Reports relating to copyright:

- pub135: Copyright Issues Relevant to Digital Preservation and Dissemination of Pre-1972 Commercial Sound Recordings by Libraries and Archives by June M. Besek, December 2005.
<http://www.clir.org/pubs/abstract/pub135abst.html>
- pub134: Acquiring Copyright Permission to Digitize and Provide Open Access to Books by Denise Troll Covey, October 2005.
<http://www.clir.org/pubs/abstract/pub134abst.html>

Collaborative Digitization Program Educator Resources page

<http://www.cdpheritage.org/educator/cdp/resources.cfm?mode=2&browse=0>

- Copyright for Educators: <http://falcon.jmu.edu/~ramseyil/copy.htm>
- “Copyright with Cyberbee,” The Virtual University Professional Development Partnership Columbus Education Association and Otterbein College
<http://www.cyberbee.com/copyrt.html>

Cornell University Copyright Information Center

<http://www.copyright.cornell.edu/>

This site lists other websites discussing copyright and includes a copyright tutorial.

Copyright and Fair Use Guidelines for Teachers

<http://www.mediafestival.org/copyrightchart.html>

Digital Library of Georgia: Securing Permission to Digitize and Display Collections Online

<http://dlg.galileo.usg.edu/AboutDLG/DisplayPermission.html>

Hirtle, Peter, **Copyright Term and the Public Domain in the United States**

http://www.copyright.cornell.edu/training/Hirtle_Public_Domain.htm

This chart indicates when published and unpublished materials will pass into the public domain.

How to Understand Copyright Restrictions (Library of Congress American Memory Project)

<http://memory.loc.gov/learn/start/cpyrt/index.html>

Stanford University: Copyright and Fair Use

<http://fairuse.stanford.edu/>

This helpful site includes sections on fair use; copyright, books, and internet sites; resources for librarians; and current issues and legislation. It also includes commentary and analysis by scholars and experts.

University of Texas at Austin: Crash Course in Copyright

<http://www.utsystem.edu/ogc/IntellectualProperty/cprtindx.htm#top>

This website contains information about how ownership of copyrighted materials works, what is fair use and when and how to get permission to use someone else's materials.

9. Information Literacy

Beck, Susan E., “The Good, the Bad, and the Ugly: Why it’s a good idea to evaluate web sources,” Collection Development Coordinator, New Mexico State University Library
<http://lib.nmsu.edu/instruction/eval.html>

National Endowment for the Humanities, Edsitement Reference Shelf: Evaluating Online Resources
http://edsitement.neh.gov/reference_shelf_evaluating.asp

10. Databases and Programming

- Databases
- ASP
- PHP
- SQL

Databases

Databases: Step-by-Step Guides to Using Databases

http://www.geekgirls.com/menu_databases.htm

A series of easy to use tutorials on database design and use, including when not to use a database. Primarily for Microsoft Access users. Does not deal with making databases available online.

Lozano, Fernando, Introduction to Relational Database Design

<http://www.edm2.com/0612/msql7.html>

A basic introduction to relational databases. Has nice explanations of joins and keys. Also discusses the first three levels of normalization, referential integrity, and indexes. Primarily aimed at mSQL users, but still fairly general in scope.

Morgan, Eric Lease, DBM's and Web Delivery

<http://www.infomotions.com/musings/dbms-and-web-delivery/>

Presentation on databases in libraries, with specific information on Filemaker, Microsoft Access, mySQL, and ODBC. Includes examples of code that can search for and manipulate data through the web.

Web Developer's Virtual Library: Web Databases

<http://www.wdvl.com/Authoring/DB/>

Articles and Tutorials on database design and creation. Includes information on relational databases, SQL, PHP, MySQL, and more.

Webmonkey, The Web Developer's Resource: Your First Database

<http://webmonkey.wired.com/webmonkey/backend/databases/tutorials/tutorial3.html>

Basic tutorial on creating a database and putting it on the Web using Microsoft Access and ASP.

ASP

ASP Free: Database

<http://www.aspfree.com/c/a/Database/> and <http://www.aspfree.com/c/a/Database-Code/>

Lists of articles on using ASP with databases. These articles tend to be for intermediate to advanced programmers.

Web Developer's Virtual Library: ASP

<http://www.wdvl.com/Authoring/ASP/>

Articles and tutorials on ASP programming, including how to build web enabled databases.

PHP

PHP: Hypertext Preprocessor

<http://www.php.net/>

The official source for all information PHP. Download the software, see tutorials, read the manuals, learn about conferences, get help, find bibliographies, get sample code. It's all here. Includes:

- Official PHP Manual <http://us2.php.net/manual/en/index.php>
- PHP Tutorial from the PHP Manual <http://us2.php.net/tut.php>

Devshed: PHP

<http://www.devshed.com/c/b/PHP>

Tutorials, articles, code samples, and more. These articles tend to be for intermediate to advanced programmers.

Free2Code: Introduction to PHP

<http://www.free2code.net/plugins/articles/read.php?id=259>

Short, easy to understand introduction to using PHP to generate dynamic web content. Includes links to related and follow-up articles.

SQL

A Gentle Introduction to SQL

<http://sqlzoo.net/>

An interactive tutorial with live exercises using the publicly available CIA World Factbook database, giving you a chance to write and test your own SQL. Also includes a reference section that details the syntax of common functions in SQL Server, Oracle, MySQL, DB2, Mimer SQL, PostgreSQL, and Microsoft Access. Gives you the ability to see and compare SQL statements from various RDBMS's.

SQL Tutorial and Reference (EN)

http://aam.ugpl.de/?q=sql_help

This is the English language version of German tutorial. It is more of a reference manual than a tutorial. The navigation system makes it fairly easy to find the proper syntax of many basic SQL commands.