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There are numerous excellent sources of guidance covering all aspects of digital materials creation. This is an area where there is not only theoretical guidance but recommendations based on solid practical experience. There is now such a rich source of information relating to creating digital materials, that it is possible to avoid many of the pitfalls experienced by earlier projects. The difficulty, particularly for those new to the task, is in selecting which of the bewildering array of resources best suits a specific need. The purpose of this further reading list is to simplify the task of finding the resource most suited to a particular situation by categorising key guidance documents and supplying sufficient descriptive information to assess their relevance.

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Corporate policies and strategies - guidance

1. Beagrie, N. and Greenstein, D. (1998). A Strategic Policy Framework for Creating and Preserving Digital Collections. Version 4.0 (Final Draft). ELib Supporting Study P3. Library Information Technology Centre, South Bank University, London. Also available online at: <http://ahds.ac.uk/strategic.htm>

Update 26-11-2004

Version 5 of this document is now available in either PDF or Word format at:

<http://www.ahds.ac.uk/about/publications/index.htm>

The study aims to provide a strategic policy framework for the creation and preservation of digital resources, and to develop guidance based on case studies, further literature and ongoing projects which will facilitate effective implementation of the policy framework. The authors advocate the concept of a life-cycle approach in preserving digital resources and suggest that the ability to preserve digital resources into the long-term rest heavily on decisions made at different stages in the life-cycle. Decisions taken during design and creation and those taken when a resource is accessioned into a collection are considered the most influential. Case studies are divided into six categories: data banks; digitisers; funding and other agencies; institutional archives; academic data archives; legal deposit libraries.

2. DLM Forum. (1997). Guidelines on Best Practice for Using Electronic Information.

<http://europa.eu.int/ISPO/dlm/documents/gdlines.pdf> [PDF]

Update 19 March 2008

No longer available - information at

<http://ec.europa.eu/archives/ISPO/dlm/>

Designed as multidisciplinary guidelines and arising out of the DLM Forum, a European forum which brings together experts from industry, research, administration and archives to discuss issues of mutual concern. The Guidelines are intended to help define short and medium term strategies for managing electronically stored data. Annex 8.4 contains a checklist for an electronic information strategy.

3. Electronic Records Management: Framework for Information Age Government. March 2000. <http://www.e-envoy.gov.uk/assetRoot/04/00/22/94/04002294.rtf>

Update 26-11-2004

Electronic Records Management: Framework for Information Age Government. April 2000. <http://e-government.cabinetoffice.gov.uk/assetRoot/04/00/22/94/04002294.rtf>

Update 12 Mar 2007

Replaced with link to PDF

[http://archive.cabinetoffice.gov.uk/e-envoy/resources-pdfs/\\$file/erm.pdf](http://archive.cabinetoffice.gov.uk/e-envoy/resources-pdfs/$file/erm.pdf)

Developed to provide guidance to departments which will need to commence working towards the Modernising Government target of all newly created public records being both electronically stored and retrieved by 2004.

4. Hedstrom, M. and Montgomery, S. (1998). Digital Preservation Needs and Requirements in RLG Member Institutions. Mountain View, CA: RLG.

www.oclc.org/programs/ourwork/past/digpresneeds/digpres.pdf

Update, 07 May 2010

From rlg.org to oclc.org

Fifty-four RLG member institutions were surveyed for this study, including seven in the UK. One of the key questions the study was charged with answering was what policies and practices are being used to preserve digital materials. The report concluded that digital preservation policies are not well developed in member institutions and that "among those institutions with digital preservation responsibilities, the lack of good models for digital preservation and confusion about the most appropriate methods and approaches are major obstacles to developing effective policies and practices."

5. Public Record Office. (1999). Guidelines on the Management, Appraisal and Preservation of Electronic Records. Volumes 1: Principles, and 2: Procedures. Kew: Public Record Office.

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

These two publications are part of a series of guidance documents prepared under the auspices of the Electronic Records from Office Systems (EROS) programme of the Public Record Office. Volume 1, Principles, sets the scene for electronic record management and provides broad strategies arising out of the principles. Volume 2: Procedures, provides more detailed guidance for putting the principles into practice. Chapter 5 of this volume contains guidance on how to develop a preservation strategy and advises that the plan must be agreed by three parties, the systems administrator, the records manager, and the budget holder. This advice reinforces the need to a) involve what may well be administratively separate parts of the

organisation in the development of an effective strategy (for example, Records and IT Managers) and b) the importance of corporate ownership of the strategy.

6. RLG/DLF Task Force on Policy and Practice for Long-Term Retention of Digital Materials.

<http://www.rlg.org/preserv/digrlgdlf99.html>

This Task Force was formed in response to the findings of the RLG survey (see above Hedstrom and Montgomery, 1998). The model policies and practices gathered by the Task Force relate to three categories of digital object:

- 1) institutional records in digital form;
- 2) locally digitised materials;
- 3) electronic publications.

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Corporate policies and guidelines - institutional models

1. Columbia University Libraries. Policy for Preservation of Digital Resources. July 2000.

<http://www.columbia.edu/cu/lweb/services/preservation/dlpolicy.html>

Specifies different categories of digital resources the University accepts responsibility for, including "Digital Resources reformatted by CUL, and deemed to be of long-term value in digital form". Also points to other relevant policy documents, such as Selection Criteria for Digital Imaging Projects <http://www.columbia.edu/cu/libraries/digital/criteria.html> and Technical Recommendations for Digital Imaging Projects <http://www.columbia.edu/acis/dl/imagespec.html>

Update 24 October 2008

<http://www.columbia.edu/cu/libraries/digital/criteria.html> no longer valid

2. Library of Congress. Preservation Digital Reformatting Program. 1999.

<http://lcweb.loc.gov/preserv/prd/presdig/presintro.html>

The digitising component of the preservation reformatting program has three parts, 1) selection criteria, 2) digital reformatting principles and specifications (includes, for example, retention of analogue version of digitally reformatted items "...until the Preservation Directorate has confidence that the life-cycle management of digital data will ensure access for as long as, or longer than, the analogue version.", 3) life-cycle management of LC digital data (a term used in preference to digital preservation in order to avoid potential confusion of definition). As used here, life-cycle management is defined as "the progressive technology and workflow requirements needed to ensure long-term sustainability of and accessibility to digital objects and/or metadata."

3. National Library of Australia Digitisation Policy 2000-2004.

<http://www.nla.gov.au/policy/digitisation.html>

Described as "...a guide to both the digitisation of items held by the Library, and the management of these digital objects". While the policy covers four years, it includes a stated intention to review it annually. Also includes specific goals for the first year, which include

setting up a Digitisation Steering Committee.

4. National Library of Canada. Networked Electronic Publications Policy and Guidelines. October 1998.

<http://www.collectionscanada.ca/9/8/index-e.html>

Update 17 September 2007

Link new location

http://epe.lac-bac.gc.ca/100/200/301/nlc-bnc/networked_epubs-ef/9/8/index-e.html

5. Society of American Archivists. The Preservation of Digitized Reproductions. 1997. Online.

<http://www.archivists.org/statements/digitize.asp>

This differs from the models above in that it is intended as advice to institutions, as opposed to being tailored specifically to an individual institution. As such it tends to refer to broad principles at a fairly high level. This is probably one of the earliest explications of the role of the creator as recommended by the US Task Force. "Responsibility for long-term access to digital archives rests initially with the creator or owner of the materials. The resource and administrative implications of this fact cannot be minimized and must play a role in the decision to digitize archival and manuscript materials."

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General guidance - digital resource creation

- AHDS Guides to Good Practice

<http://www.ahds.ac.uk/creating/guides/index.htm>

The Arts and Humanities Data Service has produced a series of Guides to Good Practice to provide the arts and humanities research and teaching communities with practical instruction in applying recognised standards and good practice in the creation, preservation and use of digital materials. Some of the titles are geared towards specific disciplines while others are cross-disciplinary and geared towards providing general guidance. Titles linked online at 14 June 2001:

1. Archiving Aerial Photography and Remote Sensing Data;
2. Excavation and Fieldwork Archiving;
3. GIS (Geographic Information Systems);
4. Digitising History: a guide to creating digital resources from historical documents;
5. Creating Digital Performance Resources;
6. Creating and Documenting Electronic Texts;
7. Creating Digital Resources for the Visual Arts: Standards and Good Practice;

8. Guides to Quality in Visual Resource Imaging. July 2000.

<http://www.oclc.org/research/publications/library/visguides/index.htm>

The five guides have been commissioned by DLF and CLIR and published with RLG in

order to fill a perceived gap."While resources for instruction in digitizing text or text and images existed and were growing, none specifically addressed the challenges of two- and three-dimensional, as well as color intensive, materials. The five guides are:

1. Planning an Imaging Project, by Linda Serenson Colet, Museum of Modern Art
2. Selecting a Scanner, by Don Williams, Eastman Kodak Company
3. Imaging Systems: the Range of Factors Affecting Image Quality, by Donald D'Amato, Mitretek Systems
4. Measuring Quality of Digital Masters, by Franziska Frey, Image Permanence Institute, Rochester Institute of Technology
5. File Formats for Digital Masters, by Franziska Frey.

6. Joint RLG and NPO Preservation Conference on Guidelines for Digital Imaging. 28-30 September 1998.

<http://www.ukoln.ac.uk/events/sept-conf98/selection.html>

Gathers together a number of international experts to discuss the full range of preservation issues associated with digital imaging.

7. Kenney, Anne R. and Chapman, Stephen (1996). Digital Imaging for Libraries and Archives. New York: Cornell University Library. Ordering details online. Available:

<http://www.library.cornell.edu/preservation/dila.html>

This guide won the 1997 Leland Prize from the Society of American Archivists for "writing of superior excellence and usefulness in the field of archival history, theory and practice." The companion volume Moving Theory Into Practice (2000) is cited below.

8. Kenney, Anne R. and Rieger, Oya Y. (2000). Moving Theory Into Practice. Mountain View, CA: Research Libraries Group. (ISBN 0-9700225-0-6) View PDF of publication online.

<http://library.oclc.org/u/?p267701coll33,269>

The authors have used extensive practical knowledge to provide detailed guidance to institutions contemplating digital conversion of cultural resources.

9. Higher Education Digitisation Service (HEDS).

<http://www.heds-digital.com/>

This JISC funded service provides a full range of services, from advice and consultancy to actual scanning. Their website also contains links to papers prepared by HEDS staff and others.

Lee, S. (1999). Scoping the Future of the University of Oxford's Digital Library Collections: Final Report.

<http://www.Bodley.ox.ac.uk/scoping/report.html>

The aims of this project were:

- To document, analyse, and evaluate Oxford's current digitisation activities, as a basis for assessing the effectiveness of the various methodologies used.
- To investigate the possibilities for building on the existing project-based work and for migrating it into viable services for library users.
- To develop appropriate selection criteria for creating digital collections in the context of local, national, and international scholarly requirements for digital library products and services.
- To make recommendations for further investment and activity within the UK research libraries community.

The resulting report, with ten appendices, is an extremely detailed investigation of a whole range of issues amounting to a strategic plan for the future digital library development of this institution. While specifically designed for one university, the issues are also applicable to many other organisational contexts.

- NOF-digitise Technical Standards and Guidelines. Version One; June 2000.

<http://www.peoplesnetwork.gov.uk/content/technical.asp>

Update 27-01-2006

This link no longer active. Version One and later versions available at:

[http://www.mla.gov.uk/webdav/harmonise?Page/@id=73&Document/@id=18612&Section\[@stateId_eq_left_hand_root\]/@id=4332](http://www.mla.gov.uk/webdav/harmonise?Page/@id=73&Document/@id=18612&Section[@stateId_eq_left_hand_root]/@id=4332)

Update 18 December 2008

No longer available

Stage two of the nof-digitise programme has provided £1½50 million worth of funding for the creation of digital content for users of the People's network and the national grid for learning. A web-based resource has been provided to support Stage two, providing advice on standards for accessibility, availability, document and file formats, search and request protocols, security and e-commerce, preservation and metadata.

- Technical Advisory Service for Images (TASI).

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

A JISC funded service set up to advise and support the academic community on the digital creation, storage and delivery of image-related information. TASI also collaborated with the Visual Arts Data Service (VADS) to produce Creating Digital Resources for the Visual Arts, one of the titles in the AHDS Guides to Good Practice series.

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Digitisation: outsourcing versus in-house

Decisions will need to be made on whether to outsource all or part of a digitisation project or to undertake all of it in-house. Some guidance can be found in Kenney and Chapman (1996), Chapter 5, Outsourcing Imaging Services which reviews the pros and cons of outsourcing. Tanner and Lomax-Smith (1999) suggest that while cost is likely to favour outsourcing if large volumes of material are being digitised, other factors, such as whether or not the material can be taken out of the institution, will obviously influence whether in-house digitisation will be the preferred option.

Whatever option is selected, the host institution will still need to commit significant resources to ensuring the project successfully delivers its stated goals.

1. Kenney, Anne R. and Chapman, Stephen (1996). Digital Imaging for Libraries and Archives. New York: Cornell University Library. Ordering details online.

<http://www.library.cornell.edu/preservation/dila.html>

2. Tanner, S. and Lomax-Smith, J. (1999). 'How Much Does It Really Cost?' Paper for DRH '99 Conference.

<http://heds.herts.ac.uk/resources/papers/drh99.pdf> [PDF]

Update 09 Nov 2007

Paper no longer available online

3. RLG Tools for Digital Imaging

<http://www.rlg.org/preserv/RLGtools.html>

RLG Tools for Digital Imaging provide guidance in the form of:

- A worksheet for Estimating Digital Reformatting Costs.
- RLG Guidelines for Creating a Request for Proposal.
- RLG Model RFI (an example of how Cornell University invited vendors that would be interested in receiving their project RFP).
- RLG Model RFP (an example of how Cornell University adapted the RLG Guidelines for Creating a Request for Proposal for use in a text-based digitisation project).

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Guidance on selection for digitisation

1. Ayris, Paul. (1998). 'Guidance for selecting materials for digitisation'. Joint RLG and NPO Preservation Conference: Guidelines for Digital Imaging.

<http://www.rlg.org/preserv/joint/ayris.html>

The paper identifies studies which have considered the role of selection in the process of digitisation and suggests a decision-making matrix of twenty questions grouped around four

issues, Assessment; Gains; Standards; Administrative Issues.

2. Lee, S. (1999). Scoping the Future of the University of Oxford's Digital Library Collections: Final Report.

<http://www.Bodley.ox.ac.uk/scoping/report.html>

Appendix B is a detailed workflow chart providing assistance in deciding whether or not to proceed with a digitisation project.

3. Hazen, D., Horrell, J. and Merrill-Oldham, J. (1998). Selecting Research Collections for Digitization. Council on Library and Information Resources, August 1998.

<http://www.clir.org/pubs/reports/reports.html>

Provides detailed planning information for research libraries contemplating large-scale digital conversion of holdings for research and teaching purposes. Discusses selection criteria, imaging standards, rights management issues, preservation concerns, and impact of digitisation on the library and its users.

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Funding

1. The Technical Advisory Service for Images (TASI) maintains a list of potential sources of funding on its website.

<http://www.tasi.ac.uk/resources/funding.html>

Note that some of these have specific clauses relating to digital preservation. For example the Arts and Humanities Research Board (AHRB) makes it a condition that for grants awarded where a significant product or by-product is the creation of an electronic resource, it is offered for deposit at the Arts and Humanities Data Service (AHDS) within three months of the end of the project. Both time and adequate funding are provided to prepare the data for deposit (see AHRB Grant Applications and Awards: <http://www.ahds.ac.uk/ahrb/>). The New Opportunities Fund (NOF) advises in their Information for Applicants that intellectual property issues and technical standards identified by NOF must be observed (see New Opportunities Fund, information for new applicants at <http://www.nof-digitise.org>

Update 20-09-2005

This link no longer active. The NOF has now been replaced by the Big Lottery Fund:

<http://www.biglotteryfund.org.uk/>

).

The deadlines for responding to calls for proposals may not always mean that it is feasible to include all costs for the project, and in particular for keeping the data but it does need to be acknowledged that this will become a cost to the institution. See also [Costs](#).

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Preservation metadata

1. National Archives of Australia. Recordkeeping Metadata Standard for Commonwealth Agencies. May 1999.

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

Update 17 September 2007

This document no longer available online

2. Bearman, David and Sochats, Ken. (1996). Metadata Requirements for Evidence. Pittsburgh, Pa: University of Pittsburgh School of Information Science.

<http://www.archimuse.com/papers/nhprc/BACartic.html>

3. Cedars Project Team and UKOLN. Metadata for Digital Preservation: the Cedars Project Outline Specification. Draft for Public Consultation. March 2000

<http://www.leeds.ac.uk/cedars>

This document represents a major aspect of the work of Cedars in the development of a metadata framework which will enable the long-term preservation of digital resources. The outline indicates that it generally adheres to the metadata identified by the Reference Model for an Open Archival Information System (OAIS). The document "starts with the structure provided by the OAIS model and populates it with metadata elements chosen by practical investigation of archiving real digital resources, further refined by comments received from a selective consultation process." It also restricts itself to metadata required for preservation, rather than other processes.

4. Dollar, Charles. (1999). Authentic Electronic Records: Strategies for Long-Term Access. Chicago: Cohasset Associates. (ISBN 0-9700640-0-4) Appendix 7. Preservation Metadata Model.

5. National Library of Australia. Draft Preservation Metadata Set. October 1999

<http://www.nla.gov.au/preserve/pmeta.html>

This has been developed as part of the NLA's plans for its digital collections. The introduction states that " There have been a number of efforts to develop metadata specifications and sets to support a wide variety of digital resources. Because of its pressing business needs to manage both 'born digital' and 'digital surrogate' collections, the National Library of Australia has tried to find, or if necessary develop, metadata models to accommodate both." The draft also emphasises that the metadata set is intended as a data output model, i.e. information required to manage digital collections, not necessarily what data should be entered, how it should be entered, by whom, and at what time. Like the Cedars specification, this document restricts itself to metadata required for preservation.

6. Public Record Office. (1999). Guidelines on the Management, Appraisal, and Preservation of Electronic Records. Volume 2: Principles. Chapter 2.

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

Defines three classes of metadata: document metadata; record level metadata; and file/folder metadata and recommends elements for each.

7. RLG Working Group on Preservation Issues of Metadata; Final Report. May 1998.

<http://www.rlg.org/preserv/presmeta.html>

The Working Group noted that to date, the emphasis of metadata has been on resource discovery and retrieval. Taking two prominent metadata systems, Dublin Core and the Program for Cooperative Cataloguing's USMARC-based core record standard, the group specified those elements not covered by these two systems but important to serve the preservation needs of digital masters. The group confined itself to digital image files and recommended sixteen data elements for this category of digital resource.

See also [Metadata and Documentation](#) .

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Technical standards

1. Beagrie, N. and Greenstein, D. (1998). Managing Digital Collections: AHDS Policies, Standards and Practices. Consultation Draft. December 1998.

<http://www.ahds.ac.uk/about/reports-and-policies/index.htm>

Section 2.9.2 Technical Standards, provides a summary of preferred formats recommended by AHDS service providers. Further details are available in individual Guides to Good Practice.

2. DLM Forum. (1997). Guidelines on Best Practice for Using Electronic Information.

<http://europa.eu.int/ISPO/dlm/documents/gdlines.pdf> [PDF]

Update 19 March 2008

No longer available - information at

<http://ec.europa.eu/archives/ISPO/dlm/>

Chapter 5, Short and long-term preservation of electronic information, offers advice on data storage media (including advice on storage conditions) and file formats. The general advice is "Best practice is to decide on a common set of standards from the outset to make it easier to circulate information. Preferably the same formats should be used for both short-term and long-term preservation".

Both storage media and file formats are grouped into families, with examples of the major types in each.

3. Public Record Office (Victoria). Standard for the Management of Electronic Records. PROS 99/007. Version 1.0 April 2000.

<http://www.prov.vic.gov.au/vers/standards/pros9907/99-7toc.htm>

Update 26-11-2004

Version 2 now available: Management of Electronic Records PROS 99/007 (Version 2)

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

Designed for the Victorian public sector records (but with much that is applicable at a more global level) the standard provides three specifications which provide:

- 1) technical detail about the long-term preservation of electronic records;
 - 2) the requirements for records management systems which maintain electronic records;
- and
- 3) the metadata required for the proper management and retention of electronic records.
4. TASI. Advice: Creating Digital Images.
<http://www.tasi.ac.uk/advice/advice.html>
Includes general advice on selecting file formats for images.

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Digitisation Costs

Specific Case Studies of Digitisation Projects

1. Internet Library of Early Journals (ILEJ). (1999). <http://www.bodley.ox.ac.uk/ilej>

This eLib project involved the universities of Birmingham, Leeds, Manchester, and Oxford and investigated the feasibility of digitising substantial runs of selected 18th and 19th century British journals. The final report of the project makes a number of observations and recommendations. The chapter on costs indicates an estimated cost of £4.21 per indexed page image accessible on the Internet but notes that "this estimate of expenditure does not take into account the contribution of the IT and library infrastructure of the four institutions". Archiving costs have been estimated at £20 per Gb per annum, totalling around £2,400 p.a. for the ILEJ project. The long-term future and funding of this was still unclear in June 2000.

2. Lee, S. (1999). Scoping the Future of the University of Oxford's Digital Library Collections: Final Report.

<http://www.Bodley.ox.ac.uk/scoping/report.html>

Appendix E, Digitization Method, includes examples of costs established from projects, including JIDI, BUILDER, and the Wilfred Owen project. It also cites examples of the cost-effectiveness of outsourcing.

General guidance on estimating costs of creating digital surrogates

1. Puglia, S. (1999). 'The Costs of Digital Imaging Projects'. RLG DigiNews 3(5) October 15 1999.

<http://www.rlg.org/preserv/diginews/diginews3-5.html>

Averages data from a number of individual projects and estimates that for production costs, approximately one-third are for digital conversion, slightly less than one-third are for

metadata creation, slightly more than one-third are for other activities, such as administration and quality control. This article also makes the important point that long-term maintenance of the digital images and associated metadata is often not considered as part of project costs but needs to be planned for. However, the article also notes that there are few models for estimating these and they vary considerably.

2. Tanner, S. and Lomax-Smith, J. (1999). 'How Much Does It Really Cost? Paper for DRH '99 Conference.

<http://heds.herts.ac.uk/resources/papers/drh99.pdf> [PDF]

Update 09 Nov 2007

Paper no longer available online

This article provides general advice on project management and includes a matrix of potential cost factors which can be used to estimate the costs of a digitisation project.

Comparative Costs of Digitisation, Microform and Paper

1. Kingma, B. (1999). The Economics of Digital Access: the Early Canadiana Online Project.

<http://www.canadiana.org/eco/english/kingma.pdf>

Update 26-11-2004

A 2000 version of "The Costs of Print, Fiche, and Digital Access The Early Canadiana Online Project" by Bruce R. Kingma can be found at

<http://www.dlib.org/dlib/february00/kingma/02kingma.html>

This is an extremely detailed but highly specific investigation into the comparative costs of digital, print and microfiche access for the early Canadiana online project. The purpose of the project was "to lay the groundwork for the costing and creation of a Canadian digital collection and database to be made available on the Internet." This report effectively amounts to a detailed business case for making rare collections available via the Internet. It concludes that the cost of digital information is lower on a cost per library or per patron basis so long as a sufficient number of libraries are interested in subscribing to the database.

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Training

Creating/managing digital resources

The following organisations offer access to a range of training courses and workshops relating to creating and managing digital resources either organised themselves and/or linking to others.

1. Arts and Humanities Data Service. Website:
<http://ahds.ac.uk>
2. Higher Education Digitisation Service (HEDS) Website:
<http://www.heds-digital.com/>
3. Humanities Advanced Technology and Information Institute (HATII), University of Glasgow.
Website:
<http://www.hatii.arts.gla.ac.uk>
4. Humanities Computing Unit, University of Oxford. Website: <http://www.hcu.ox.ac.uk>
Update 21-12-2004
Link to the website disabled as HCU no longer in existence.
5. Technical Advisory Service (TASI) Website:
<http://www.tasi.ac.uk>

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Electronic records management

1.

Public Record Office

Website: <http://www.nationalarchives.gov.uk/recordsmanagement/training/> Training and consultancy services.

Cataloguing and Documentation Procedures

1. Reference Model for an Open Archival Information System (OAIS) Draft Recommendation for Space Data System Standard. May 1999.

Update 21-12-2002

This document is now available as either a pdf or word document from:

http://ssdoo.gsfc.nasa.gov/nost/isoas/ref_model.html

The OAIS Reference Model provides a useful overview of the "ingest" process and a high-level process model relevant to most institutions.

2. Beagrie, N and Greenstein, D. (1998). Managing Digital Collections: AHDS Policies, Standards and Practices. Consultation Draft. December 1998.

<http://www.ahds.ac.uk/about/reports-and-policies/index.htm>

Provides a summary of preferred formats recommended by AHDS service providers, and accessioning and transfer procedures use by the AHDS. It also includes two detailed case studies of accessioning in the History Data Service and the Oxford Text Archive.

3. National Archive of New Zealand. (1998). Appraisal Standard, Standard for the Appraisal of Public Records and Archives. Wellington, 1998.

http://www.archives.govt.nz/statutory_regulatory/reviews/appraisal_service/options_paper.html

Update 26-11-2004

PDF now available

<http://www.archives.govt.nz/continuum/dls/pdfs/s1-standard-appraisal.pdf> [PDF]

Update 21-12-2006

PDF now available

<http://www.archives.govt.nz/continuum/documents/publications/s1/S1-appraisal-standard-introduction.shtml>

Update 10-05-2010

Change of location

<http://continuum.archives.govt.nz/files/file/standards/s1/S1-appraisal-standard-introduction.html>

4. Public Record Office (UK). (1999). Electronic Records from Office Systems Project (EROS). Series of guides on management, appraisal and preservation of electronic records in government. Kew, Surrey, 1999.

<http://www.pro.gov.uk/recordsmanagement/eros/default.htm>

Update 12-01-2005

The EROS project has now ended. This redirected page contains links to relevant guidance:

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

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Storage and Preservation

General overviews and guidance

1. Arms, C. (2000). 'Keeping Memory Alive: Practices for Preserving Digital Content at the National Digital Library Program of the Library of Congress'. RLG DigiNews: Volume 4 (3). June 15 2000.

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

2. Dollar, C. (1999). Authentic Electronic Records: Strategies for Long-Term Access. Chicago: Cohasset Associates. (ISBN 0-9700640-0-4).

3. AHDS: Guides to Good Practice

<http://www.ahds.ac.uk/creating/guides/index.htm>

Titles linked in June 2001:

Archiving Aerial Photography and Remote Sensing Data; Excavation and Fieldwork Archiving; GIS (Geographic Information Systems);

Digitising History: a Guide to Creating Digital Resources from Historical Documents; Creating Digital Performance Resources; Creating and Documenting Electronic Texts; Creating Digital Resources for the Visual Arts: Standards and Good Practice.

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Storage and maintenance - models and guidance

1. DLM Forum. (1997). Guidelines on Best Practice for Using Electronic Information.
<http://europa.eu.int/ISPO/dlm/documents/gdlines.pdf>
Update 19 March 2008
No longer available - information at
<http://ec.europa.eu/archives/ISPO/dlm/>
2. A Digital Preservation Strategy for the PRO. November 1999.
3. National Library of Australia. First Steps in Preserving Digital Publications. 1999.
<http://www.nla.gov.au/pres/epupam.html>
4. Woodyard, D. (1999). 'Practical Advice for Preserving Publications on Disk'. Presented at Information Online and Ondisc '99, Darling Harbour, Sydney, 21st & 22nd January 1999.
<http://www.nla.gov.au/nla/staffpaper/woodyard2.html>
5. National Library of Canada. Networked Electronic Publications: Policies and Guidelines. October 1998.
<http://www.collectionscanada.ca/9/8/index-e.html>
Update 17 September 2007
Link new location
http://epe.lac-bac.gc.ca/100/200/301/nlc-bnc/networked_epubs-ef/9/8/index-e.html
6. NOF-digitise Technical Standards and Guidelines. Version One; June 2000.
<http://www.peoplesnetwork.gov.uk/content/technical.asp>
Update 27-01-2006
This link no longer active. Version One and later versions available at:
[http://www.mla.gov.uk/webdav/harmonise?Page/@id=73&Document/@id=18612&Section\[@stateId_eq_left_hand_root\]/@id=433](http://www.mla.gov.uk/webdav/harmonise?Page/@id=73&Document/@id=18612&Section[@stateId_eq_left_hand_root]/@id=433)
Update 18 December 2008
No longer available
7. Oxford University. Policy on Computer Archiving Service. 1997.
<http://www.oucs.ox.ac.uk/hfs/policy/archive.xml>
8. Oxford University Computing Services. Preservation of the Electronic Assets of a University. 1997.

<http://www.lmcp.jussieu.fr/eunis/html3/congres/EUNIS97/papers/052202.html>

9. PADI.'Storage'.

<http://www.nla.gov.au/padi/topics/10.html>

10. TASI. Recommendations for Digital Preservation and Storage.

<http://www.tasi.ac.uk/delivering/digpres.html>

11. Van Bogart, J. (1995). Magnetic Tape Storage and Handling. Council on Library and Information Resources. (ISBN 1-887334-40-8).

<http://www.clir.org/pubs/reports/pub54>

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Preservation strategies

Overviews and general guidance

1. Bearman, D. (1999). 'Reality and Chimeras in the Preservation of Electronic Records'. D-Lib Magazine. April 1999.

<http://www.dlib.org/dlib/april99/bearman/04bearman.html>

2. Berthon, H. and Webb, C. (2000). 'The Moving Frontier: Archiving, Preservation and Tomorrow's Digital Heritage.' Paper presented at VALA 2000 - 10th VALA Biennial Conference and Exhibition, Melbourne, Victoria, 16-18 February 2000.

<http://www.nla.gov.au/nla/staffpaper/hberthon2.html>

3. Hendley, T. (1998). Comparison of Methods & Costs of Digital Preservation. British Library Research and Innovation Report 106. London: The British Library. (ISBN 0 7123 9713 2)

<http://www.ukoln.ac.uk/services/elib/papers/tavistock/hendley/hendley.html>

4. PADI.'Digital Preservation Strategies'.

<http://www.nla.gov.au/padi/topics/18.html>

Migration

1. Lawrence, G.W. et al. (2000). Risk Management of Digital Information: a File Format Investigation. Council on Library and Information Resources. June 2000. (ISBN 1-887334-78-5).

<http://www.clir.org/pubs/abstract/pub93abst.html>

Emulation

1. CAMiLEON (Creative Archiving at Michigan and Leeds; Emulating the Old and the New)

Project. Three-year NSF/JISC funded project commenced 1 October 1999. Further details online. Available from the Cedars website:

<http://www.leeds.ac.uk/cedars>

2. Rothenberg, J. (2000). An Experiment in Using Emulation to Preserve Digital Publications. A report commissioned by the Koninklijke Bibliotheek (KB).
<http://www.kb.nl/coop/nedlib/results/emulationpreservationreport.pdf> [PDF]

Update 11 Aug 2006

New location <http://nedlib.kb.nl/results/emulationpreservationreport.pdf>

3. Rothenberg, J. (1999). Avoiding Technological Quicksand: Finding a Viable Technical Foundation for Digital Preservation. Council on Library and Information Resources. January 1999. (ISBN 1-887334-63-7).
<http://www.clir.org/pubs/abstract/pub77.html>

Digital archaeology

1. Ross, S. and Gow, A. (1999). Digital Archaeology: Rescuing Neglected and Damaged Data Resources. British Library Research and Innovation Report 108. London, British Library, 1999.

<http://www.hatii.arts.gla.ac.uk/research/BrLibrary/rosgowrt.pdf> [PDF]

Encapsulation

1. Heminger, A. R. and Robertson, S. B. (1998). 'Digital Rosetta Stone: A Conceptual Model for Maintaining Long-Term Access to Digital Documents.' ERCIM Workshop Proceedings No. 98-W003.

<http://www.ercim.org/publication/ws-proceedings/DELOS6/rosetta.pdf> [PDF]

2. Reference Model for an Open Archival Information System (OAIS) Draft Recommendation for Space Data System Standards, of the Consultative Committee for Space Data Systems (CCSDS), CCSDS 650.0-R-1, May 1999.
<http://www.ccsds.org/documents/650x0b1.pdf>

Update 27-01-2006

The draft OAIS recommendation is no longer available, the full specification (2002) can be found at: <http://public.ccsds.org/publications/archive/650x0b1.pdf>

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Metadata and Documentation

Documentation - standards and guidance

1. Data Documentation Initiative (DDI)
<http://www.icpsr.umich.edu/DDI/codebook>

Update 10-05-10

URL outdated

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

This is an example of an initiative by a particular community, the social science research community, to "establish an international criterion and methodology for the content, presentation, transport and preservation of metadata about data sets in the social and behavioral sciences." Social science research has for many years pioneered the re-use of data emanating from research projects.

2. The Data Archive, University of Essex. Guide to Depositing Data. Guidelines for Documenting Data.

<http://www.data-archive.ac.uk>

3. Arts and Humanities Data Service.

<http://www.ahds.ac.uk>

Individual service providers offer guidance on documentation, for example, the History Data Service: Guidelines for Documenting Data <http://hds.essex.ac.uk/docguide.asp> and the Archaeology Data Service, Guidelines for Depositors Version 1.1
<http://ads.ahds.ac.uk/project/userinfo/deposit.html>.

Update 11th April 2008

URL no longer available. Version 1.3 available at

<http://ads.ahds.ac.uk/project/userinfo/deposit.cfm>

In addition, the Guides to Good Practice series also offer advice as well as guidance on why documentation is important. For example Creating Digital Resources for the Visual Arts: Standards and Good Practice. Section 4. Standards for Data Documentation http://vads.ahds.ac.uk/guides/creating_guide/sect41.html and Creating and Documenting Electronic Texts. Chapter 6: Documentation and Metadata.
<http://ota.ahds.ac.uk/documents/creating/chap6.html>.

Update 09 May 2008

New location

<http://ota.oucs.ox.ac.uk/documents/creating/cdet/chap6.html>

Metadata - developing standards

1. RLG Working Group on Preservation Issues of Metadata. Final Report. May 1998.
<http://www.rlg.org/preserv/presmeta.html>

Update 10-05-2010

Now archived on OCLC website

<http://www.oclc.org/research/activities/past/rlg/digpresmetadata/report.htm>

The Working Group noted that to date the emphasis of metadata has been on resource discovery and retrieval. Taking two prominent metadata systems, Dublin Core and the Program for Cooperative Cataloguing's USMARC-based core record standard, the group specified those elements not covered by these two systems but important to serve the preservation needs of digital masters. The group confined itself to digital image files and recommended sixteen data elements for this category of digital resource.

2. Reference Model for an Open Archival Information System (OAIS) Draft Recommendation for Space Data System Standard. May 1999.

Update 21-12-2002

This document is now available as either a pdf or word document from:

http://ssdoo.gsfc.nasa.gov/nost/isoas/ref_model.html

This model aims to develop a common framework for all archives, digital and non digital. However of particular relevance and interest to the understanding of digital resources is the OAIS definition of Archival Information Packages (AIP's).

This recognises and identifies the range of elements required before a digital resource is useable and reinforces the fundamental differences between preserving digital and traditional resources. An AIP consists of both content information (both the data object and any Representation Information (RI) needed to render it intelligible) and Preservation Description Information (PDI), descriptive metadata which allows the essence of what the content information is to be understood indefinitely.

3. NEDLIB (Networked European Deposit Library)

<http://www.kb.nl/nedlib>

This project has twelve partners consisting of deposit libraries, archives, and IT developers. Three publishers are also contributing to the project, which runs from January 1998 to December 2000. The main focus of NEDLIB has been on the technical aspects of digital preservation. NEDLIB has based its Deposit System for Electronic Publications (DSEP) on the OAIS model but has added a specific preservation module specifically to identify where "transformation processes" (i.e. migrations) take place.

4. Cedars Project Team and UKOLN. Metadata for Digital Preservation: the Cedars Project Outline Specification. Draft for Public Consultation. March 2000.

<http://www.leeds.ac.uk/cedars>

This document represents a major aspect of the work of Cedars in the development of a metadata framework which will enable the long-term preservation of digital resources. The outline indicates that it generally adheres to the metadata identified by the Reference Model for an Open Archival Information System (OAIS). The document "starts with the structure provided by the OAIS model and populates it with metadata elements chosen by practical investigation of archiving real digital resources, further refined by comments received from a selective consultation process." It also restricts itself to metadata required for preservation, rather than other processes.

5. National Library of Australia. Draft Preservation Metadata Set. October 1999.
<http://www.nla.gov.au/preserve/pmeta.html>

This has been developed as part of the NLA's plans for its digital collections. The introduction states that "There have been a number of efforts to develop metadata specifications and sets to support a wide variety of digital resources. Because of its pressing business needs to manage both 'born digital' and 'digital surrogate' collections, the National Library of Australia has tried to find, or if necessary develop, metadata models to accommodate both." The draft also emphasises that the metadata set is intended as a data output model, i.e. information required to manage digital collections, not necessarily what data should be entered, how it should be entered, by whom, and at what time. Like the Cedars specification, this document restricts itself to metadata required for preservation.

6. RLG/OCLC
<http://www.rlg.org/pr/pr2000-oclc.html>

On March 10 2000, RLG and OCLC agreed to combine forces to work towards creating infrastructures for digital archiving. The first steps towards this wider aim are collaboration on two working documents, one on characteristics of reliable archiving services and another on preservation metadata. The draft documents will be made available on both the RLG <http://www.rlg.org/> and OCLC <http://www.oclc.org> and comments will be invited before final publication.

Update 03 October 2007

RLG has merged with OCLC <http://www.oclc.org/>

The above examples of work being undertaken in this area have all been based on practical experience and identified needs and show considerable progress is being made. Ongoing development is still needed, particularly for "published" digital resources. This is because a) it is impossible to predict precisely what will be required for heterogeneous digital resources, and b) as the above examples demonstrate, it is difficult to establish a standard set of elements satisfying the requirements of all institutions for all digital resources.

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Record keeping metadata

1. National Archives of Australia. Recordkeeping Metadata Standard for Commonwealth Agencies. May 1999.

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

Update 26 September 2007

This document no longer available online

2. Bearman, David and Sochats, Ken. (1996). Metadata Requirements for Evidence. Pittsburgh, Pa: University of Pittsburgh School of Information Science.
<http://www.archimuse.com/papers/nhprc/BACartic.html>
3. Dollar, Charles. (1999). Authentic Electronic Records: Strategies for Long-Term Access. Chicago: Cohasset Associates. (ISBN 0-9700640-0-4).
Appendix 7. Preservation Metadata Model.

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Access

Many of the references cited in further reading sections elsewhere in the handbook, in particular those in [Creating Digital Materials](#) also include sections relevant to access. In addition, the following are references for model licences:

1. ECUP (European Copyright User Platform) Licensing Issues.
<http://www.eblida.org/ecup/licensing/lic.htm>
Update 07 Mar 2007
Link removed.
2. Licensingmodels.com.
<http://www.licensingmodels.com>
3. NESLI (National Electronic Site Licensing Initiative).
<http://www.nesli2.ac.uk>

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