



DPC/PADI What's new in digital preservation

A joint service of the **Digital Preservation Coalition** and [PADI](#)

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This is a summary of selected recent activity in the field of digital preservation compiled from the Preserving Access to Digital Information ([PADI](#)) Gateway and the [digital-preservation](#) and [padiforum-l](#) mailing lists. Additional or related items of interest may also be included.

1. Organisations
2. Specific initiatives
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1. Organisations

1.1 UNESCO

On October 17, at its 32nd session, UNESCO's General Conference adopted the Draft Charter on the Preservation of the Digital Heritage. The Charter is a declaration of principle to assist Member States in preparation of national policies to preserve and provide access to digital heritage. The Charter describes the digital heritage as those unique resources of human knowledge and expression in digital form, and recognises both the risk to this material through technological obsolescence and the urgency required to ensure its preservation.

In a recent article, Colin Webb of the National Library of Australia discusses both the Draft Charter and its associated Guidelines. The consultation processes in formulating the Charter are described, and the Guidelines are discussed within the context of readership

and how the information is structured, with inclusion of sample principles from the Guidelines.

The general UNESCO press release from the 32nd session, which includes coverage of the Draft Charter is available from the [UNESCO Web site](#).

The UNESCO Draft Charter on the Preservation of the Digital Heritage (Document 32 C/28) may be found at:
<http://unesdoc.unesco.org/images/0013/001311/131178e.pdf>

The companion document, *Guidelines for the preservation of digital heritage*, is also available from the UNESCO Web site.

Colin Webb, "Saving digital heritage: a UNESCO campaign". *RLG DigiNews*, 7(3), June 2003.
<http://www.rlg.org/preserv/diginews/diginews7-3.html#feature3>

1.2 UK Joint Information Systems Committee (JISC)

In conjunction with the the UK Research Council's e-Science Core Programme, the JISC has invited bids to establish a national Digital Curation Centre (DCC), which will lead research into key areas for digital curation and the development of support services for maintaining digital data for the higher education sector. The Centre will provide a national focus for research into curation issues and the development of expertise, services and best practice activities in the processes of digital archiving, preservation and management, with particular emphasis on needs of users over the entire data life-cycle. As well as the building of a supporting infrastructure and close liaison with users to determine their needs, the Centre aims to develop testbed facilities, collate, assess, maintain and provide information on existing tools and technologies, and continue to integrate technologies and address critical gaps. The Centre will have a significant national and international role, both within Europe and as a bridge between American and European thought, and is expected to align with international approaches and be at the leading edge of developments.

The JISC and the Research Council's e-Science Core Programme held a Town Meeting in London on 8 September 2003, outlining the impetus, role, objectives and funding available for the Centre, as well as providing guidance on preparing submissions. The deadline for expressions of interest was the 26th September 2003, while full proposals have to be submitted by 13 November 2003. Funding for the DCC will be for three years.

The full text of the Digital Curation Centre circular and the report and presentations from the Town Meeting are available from the JISC web site:

JISC Circular 6/03 (Revised) : Digital Curation Centre:
http://www.jisc.ac.uk/index.cfm?name=funding_digcentre

Digital Curation Centre Town Meeting, Regent's College Conference
Centre, Regent's Park, London, 8 September, 2003:
www.jisc.ac.uk/digcentre_townmeeting.html

1.3 Digital Preservation Coalition (DPC)

A key aim of the DPC since its launch has been to raise the profile of digital preservation on behalf of all its members, which it has pursued through work with international bodies such as UNESCO and the European Commission, conference and seminar presentations, and a continued, successful media and PR campaign.

The DPC recently provided a register of and links to media coverage it has obtained via its Advocacy Campaign, with the view that such links may prove valuable to others involved in local advocacy work. The register includes DPC press coverage to June 2003 from national, international and specialist press, television and radio broadcasts and coverage on the internet. The register is available through the DPC's new Advocacy Campaign pages: <http://www.dpconline.org/graphics/advocacy/>

The DPC also recently announced its sponsorship of a new award as part of the Pilgrim Trust Conservation Awards program. Worth £5000, the Digital Preservation Award will recognise leadership and achievement in the developing field of digital preservation, and is aimed at projects that focus on "born digital" resources. Submissions for the Award closed in September, and the shortlist of candidates is now available. Of nine submissions, the shortlisted candidates are:

- The CAMiLEON Project
- The UK National Archives' Digital Archive
- The JISC Continuing Access and Preservation Strategy
- The National Library of New Zealand's Preservation Metadata Extraction Tool
- The Wellcome Library/JISC Web Archiving Project

The Award will be presented at the British Library in June 2004.

View details on the Award and the shortlist of candidates on the Digital Preservation Coalition web site:

Digital Preservation Award details:

<http://www.dpconline.org/graphics/awards/>

Shortlist of candidates:

<http://www.dpconline.org/graphics/awards/shortlist.html>

Further copies of *Preservation Management of Digital Materials: A Handbook* have been re-printed by the British Library and may be ordered via the DPC website. The online edition of the Handbook is also available.

Neil Beagrie and Maggie Jones, *Preservation Management of Digital Materials: A Handbook*, London, The British Library, 2001. ISBN 0 7123

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Reviews and order form:

<http://www.dpconline.org/graphics/handbook/reviews.html>

Online edition: <http://www.dpconline.org/graphics/handbook/>

2. Specific initiatives

2.1 United States National Digital Information Infrastructure and Preservation Program (NDIIP)

The NDIIP has released its "Program Announcement to Support Building a Network of Partners", which represents the next phase of this US national program for the collection and preservation of digital materials.

In the July issue of RLG DigiNews, Laura Campbell, Associate Librarian for Strategic Initiatives, Library of Congress, discusses this next phase, as well as funding allocation, submission of proposals, the key stakeholders involved and how other cultural institutions may participate in and benefit from the program. The expected outcomes from this phase of the program are to establish a digital preservation infrastructure, address copyright and intellectual property issues in content preservation, and to convey information about the program to stakeholders and the general public.

Project submissions close on 13 November, 2003.

National Digital Information Infrastructure and Preservation Program,
Program Announcement to Support Building a Network of Partners,
Washington DC, August 2003.
www.digitalpreservation.gov/index.php?nav=4

Laura Campbell, "Editor's interview : National Digital Information Infrastructure and Preservation Program" *RLG DigiNews*, 7(3), July 15, 2003. http://www.rlg.org/preserv/diginews/v7_n3_feature1.html

2.2 Rescue of the BBC Domesday Project

Emulation and re-engineering have been demonstrated as two different approaches to retaining access to the content of the BBC Domesday Project, an electronic resource from 1986 distributed on two videodiscs accessed through a BBC Microcomputer. Two recent articles have focused on the re-engineering approach. The article by Daisy Abbott provides an overview of both approaches, and is preceded by an interview with Paul Wheatley on the challenges of emulation. In the second article, Darlington *et al.* describe the recreation of the resource from original content within a new Windows interface.

Daisy Abbott, "Overcoming the dangers of technological obsolescence : rescuing the BBC Domesday Project" *DigiCULT.Info Newsletter* Issue 4,

August 2003, pp. 7-10 . Available in PDF format from:
<http://www.digicult.info/pages/publications.php>

Jeffrey Darlington, Andy Finney and Adrian Pearce, "Domesday redux: the rescue of the BBC Domesday Project videodiscs" *Ariadne*, Issue 36, July 2003. <http://www.ariadne.ac.uk/issue36/tna/intro.html>

Further details on the re-engineering project are available from the National Archives of the UK at: <http://www.nationalarchives.gov.uk/preservation/research/domesday.htm/default.htm>

The CAMiLEON Project's demonstrated emulation approach to rescuing the BBC Domesday Project is detailed at:
<http://www.si.umich.edu/CAMiLEON/domesday/domesday.html>

2.3 DAVID Project

The DAVID Project (Digitale Archivering in Vlaamse Instellingen en Diensten = Digital Archiving in Flemish Institutions and Administrations) is a collaborative project between the Max Wildiers Foundation, the City of Antwerp Archives and ICRI (Interdisciplinary Centre for Law and Information Technology) to research digital durability in a governmental environment. It seeks to develop best practices for archiving digital data for the benefit of Flemish archival institutions, with the ultimate aim of producing guidelines manuals for digital archiving and digitisation of historical documents.

The project has produced several key reports and case studies in archiving of email, websites, office documents and population data, and continues to regularly make new reports available on its web site. The project also recently hosted a conference on electronic record keeping and long-term preservation of digital data at Louvain, Belgium, on 26 June 2003. The conference is noted in the *Recent Events* section (see below).

Recent papers:

Filip Boudrez, *Archiving electronic office documents*, Antwerp, DAVID Project, 2003. [PDF]

DAVID Project, *Archiving MS Word documents as PDF-documents*, Antwerp: DAVID Project, 2003.
www.antwerpen.be/david/website/eng/index2.htm

More information and links to new reports as they are released are available via:
<http://www.antwerpen.be/david/website/eng/index2.htm>

2.4 The European Libraries (TEL) project

In September The European Libraries (TEL) released the final version of a report providing the results of a survey of European publishers. Based on the responses of 39

publishers, the report covers areas such as deposit practices, access, metadata, pricing and comments on the advantages and disadvantages of depositing digital publications. The survey was conducted as part of the project's Work Package 1 (WP1), the aim of which is to develop better working relations between European National Libraries and publishers in relation to the deposit of digital publications.

Liesbeth Oskamp, *Report on current practices among publishers regarding the deposit of digital publications*, IST-2000-25347. The European Library project, July 2003.
www.europeanlibrary.org/pdf/tel_d1.2v1.0.pdf

Other reports from this organisation are available via the "Results" link on TEL's web page: <http://www.europeanlibrary.org/>

3. Specific Areas of Activity

3.1 Institutional Repositories, E-prints and E-journals

Academic self-archiving, institutional repositories and maintaining access to electronic journals have been in the spotlight recently, with a large number of publications in these related areas. Both intellectual property and technical issues have been examined.

Focusing on creators of digital information resources, Abby Smith's article in the May/June issue of *Educause Review* discussed the idea that future scholarship depends on current digital diligence by both libraries and scholars and that scholars need to develop work practices that will help ensure the integrity of a digital project long after the creator has moved on.

Abby Smith, "Digital preservation: an individual responsibility for communal scholarship" *Educause Review*, 38(3), May/June 2003, pp. 10-11. <http://www.educause.edu/ir/library/pdf/erm0338.pdf>

Institutional repositories

There have been several papers about DSpace, MIT's institutional repository system. Clifford Lynch addresses the strategic role of institutional repositories in universities as a means for advancing scholarship and scholarly communication and cites DSpace as a model for universities for the future. He also addresses institutional repositories' relationship with networked information standards and infrastructure, and provides his views for future developments in this field. The Hewlett-Packard Laboratories and MIT team have themselves recently presented two papers at ECDL and JCDL 2003 on the current architecture and future directions for the DSpace repository system.

Other publications have focused on the downstream issues and proposed solutions for maintaining access to digital scholarly resources.

Rob Tansley, Mick Bass, David Stuve, Margret Branschofsky, Daniel Chudnov, Greg McClellan, and MacKenzie Smith, "The DSpace institutional digital repository system: current functionality." In: Catherine C. Marshall, Geneva Henry, and Lois Delcambre, *Proceedings 2003 Joint Conference on Digital Libraries*, Los Alamitos, Calif.: IEEE Computer Society, 2003, pp. 87-97. Abstract available at: <http://csdl.computer.org/comp/proceedings/jcdl/2003/1939/00/19390087abs.htm>

Rob Tansley, Mick Bass and MacKenzie Smith, "DSpace as an Open Archival Information System: current status and future directions." In: T. Koch & I. T. Sølberg, (eds.), *Research and Advanced Technology for Digital Libraries: 7th European Conference, ECDL 2003, Trondheim, Norway, August 17-22, 2003, Proceedings*, (Lecture Notes in Computer Science, 2769), Heidelberg: Springer-Verlag, 2003, pp. 446-460.

Clifford A. Lynch, "Institutional repositories: essential infrastructure for scholarship in the digital age" *ARL Bimonthly Report* 226, February 2003. <http://www.arl.org/newsltr/226/ir.html>

E-prints

The key findings of the Project RoMEO (Rights METadata for Open archiving), which ended in July 2003, are now available. The project was funded by the Joint Information Systems Committee for one year to investigate the rights issues surrounding the 'self-archiving' of research in the UK academic community under the Open Archive Initiative's Protocol for Metadata Harvesting (OAI-PMH). The Project's aims included stakeholder surveys to ascertain rights issues unique to research self-archived under OAI, development of a set of interoperable rights elements using existing schemas and the development of guidelines on use of the metadata elements.

A report by the Arts and Humanities Data Service, the Estonian Business Archives and SHERPA at the University of Nottingham was commissioned by the JISC and looks at the feasibility and requirements for the preservation of e-prints. The study discusses the characteristics of e-prints, their prevalence and reasons for preserving them, and reviews the current range of file formats, the extent of metadata collection and the likely future needs for infrastructure development. It also notes that while e-print repositories are still at an experimental stage, e-prints do not present unique technical challenges for preservation, and may be serviced by generic preservation strategies such conversion to standard formats, migration, migration on demand or emulation. A recent article in *D-Lib Magazine* by two of the same authors maintains that filling e-print repositories and preserving their contents need not be mutually exclusive activities and discusses the technical and managerial challenges to the preservation of e-prints within this context.

Another project, ePrints UK, will run for two years and aims to provide the higher and further education sector access to and preservation of the e-print papers available from

compliant open archive repositories. An article appearing in *Ariadne* provides a brief overview of the project, including technical issues such as database development and SOAP (Simple Object Access Protocol) interfaces, and other issues such as intellectual property rights and insufficient repositories from which to harvest records.

Elizabeth Gadd, Charles Oppenheim, and Steve Proberts, "RoMEO studies 1: the impact of copyright ownership on academic author self-archiving," *Journal of Documentation*, 59(3), 2003, 243-277:

Elizabeth Gadd, Charles Oppenheim, and Steve Proberts, "The intellectual property rights issues facing self-archiving: key findings of the RoMEO project," *D-Lib Magazine*, 9(9), September 2003:
<http://www.dlib.org/dlib/september03/gadd/09gadd.html>

The web site of Project RoMEO is available at:
<http://www.lboro.ac.uk/departments/lis/disresearch/romeo/index.html>

Hamish James, Raivo Ruusalepp, Sheila Anderson and Stephen Pinfield, *Feasibility and Requirements Study on Preservation of E-Prints : Report Commissioned by the Joint Information Systems Committee (JISC) : Consultation Draft*. Version 1.0. London, Joint Information Systems Committee (JISC), 9 May 2003.
http://www.jisc.ac.uk/uploaded_documents/e-prints_report_final.pdf

Stephen Pinfield, and Hamish James, "The digital preservation of e-prints," *D-Lib Magazine*, 9(9), September 2003:
<http://www.dlib.org/dlib/september03/pinfield/09pinfield.html>

Ruth Martin, "ePrints UK : developing a national e-prints archive". *Ariadne*, Issue 35, April 2003. <http://www.ariadne.ac.uk/issue35/martin/>

A special issue of the journal *Library Hi Tech*, edited by Timothy W. Cole, focused on the Open Archives Initiative for Metadata Harvesting (OAI-PMH), which forms a key component of the present metadata efforts of many e-print repositories. Articles include:

Carl Lagoze and Herbert van de Sompel, "The making of the Open Archives Initiative Protocol for Metadata Harvesting," *Library Hi Tech*, 21(2), 2003, pp. 118-128.

Caroline R. Arms, "Available and useful: OAI at the Library of Congress," *Library Hi Tech*, 21(2), 2003, pp. 129-139.

Michael L. Nelson, Terry L. Harrison, and JoAnne Rocker, "OAI and NASA's scientific and technical information," *Library Hi Tech*, 21(2), 2003, pp. 140-150.

Simeon Warner, "E-prints and the Open Archives Initiative," *Library Hi Tech*, 21(2), 2003, pp. 151-158.

Martin Halbert, "The Metascholar Initiative," *Library Hi Tech*, 21(2), 2003, pp. 182-198.

Library Hi Tech is available online to subscribers from <http://www.emerald-library.com/>.

E-journals

The preservation of e-journals are viewed from different perspectives in several recent papers.

JISC has acknowledged the challenges that have emerged with licensed e-journals, particularly with regard to the differing roles and responsibilities of both libraries and publishers. To that end, the committee developed a JISC/Publishers Association (PA) Model Licence that seeks to explore areas such as continued online access and different archival options.

Maggie Jones focuses on the role of the Joint Information Systems Committee (JISC) in relation to long-term preservation and continued access of licensed e-journals in both a recent journal article and the report of her one-year consultancy, which investigated issues in implementing the archiving clauses of the Model Licence.

Patsy Baudoin focuses on the preservation of dynamic electronic journals, briefly assessing the three main areas of digital preservation - migration, emulation and archaeological approaches - and states that more research is needed in the area of emulation, maintaining that this approach has the potential to preserve and capture the dynamic elements of electronic journals.

Maggie Jones, "E-journals - what do you get for your money?" *Serials: the Journal for the Serials Community*, 16(1), March 2003, pp. 27-31.
Available online via: [Ingenta Select](#)

Maggie Jones, *Archiving E-Journals Consultancy - Final Report*, London, Joint Information Systems Committee, May 2003.
http://www.jisc.ac.uk/uploaded_documents/ejournalsfinal.pdf

Patsy Baudoin, "Uppity bits: coming to terms with archiving dynamic electronic journals" *The Serials Librarian*, 43(4), 2003, pp. 63-72.

3.2 Electronic Theses and Dissertations

In a related area, several papers from the 6th International Conference on Electronic Theses and Dissertations, held in Berlin from 21-24 May, are now available.

Yahia Bakelli and Sabrina Benrahmoun of CERIST (Research Centre on Science and Technical Information) examine the issues of preservation and accessibility of theses within both an Algerian and international context. In Algeria, an electronic copy of every Masters and PhD thesis must be deposited at CERIST as a condition of obtaining the qualification.

Two papers from this conference discuss activities at Die Deutsche Bibliothek. The first describes the library's voluntary deposit system for electronic theses and dissertations using NEDLIB's process model and incorporating the Reference Model for an Open Archival Information System (OAIS). The second paper discusses the implementation, management and structure of URNs at Die Deutsche Bibliothek within the international NBN (National Bibliography Number) name space of national libraries. Practical experiences of URN management including workflows, current activities and examples are also included.

Kelsey Libner of North Carolina State University Libraries presented the results of a survey of 16 institutions into practices for the long term preservation of ETDs. Data migration, preservation policies, electronic file backup and workflows are some of the areas surveyed. The second part of the paper discusses file formats, particularly PDF and PDF/A, and discusses further areas for research.

Uppsala University's DiVA project presented a paper on their archive for ETDs, which is noted below in the section on use of XML as a digital preservation strategy.

The ETD 2003 conference web site is at: <http://www.hu-berlin.de/ETD2003/>. A report on the conference may be found in the July/August issue of *D-Lib Magazine*.

Yahia Bakelli and Sabrina Benrahmoun, "Long-term preservation of ETDs in Algeria : discussion through CERIST deposit system". Paper presented at ETD 2003: 6th International Conference on Electronic Theses and Dissertations - Next Steps: Electronic Theses and Dissertations Worldwide, Berlin, Germany, 21-24 May 2003. <http://edoc.hu-berlin.de/etd2003/bakelli-yahia/HTML/index.html>

Hans Liegmann, "Long-term preservation of electronic theses and dissertations". Paper presented at ETD 2003: 6th International Conference on Electronic Theses and Dissertations - Next Steps: Electronic Theses and Dissertations Worldwide, Berlin, Germany, 21-24 May 2003. <http://edoc.hu-berlin.de/etd2003/liegmann-hans/HTML/index.html>

Kathrin Schroeder, "Application of persistent identifiers as one approach to ensure guarantee [sic] long-term availability of online theses: the established Uniform Resource Name (URN) management at Die Deutsche Bibliothek." Paper presented at ETD 2003: 6th International Conference on Electronic Theses and Dissertations - Next Steps: Electronic Theses

and Dissertations Worldwide, Berlin, Germany, 21-24 May 2003.
<http://edoc.hu-berlin.de/etd2003/schroeder-kathrin/HTML/index.html>

Kelsey Libner, "CFP: call for preservation! Results and discussion of a survey on the preservation of electronic theses and dissertations". Paper presented at ETD 2003: 6th International Conference on Electronic Theses and Dissertations - Next Steps: Electronic Theses and Dissertations Worldwide, Berlin, Germany, 21-24 May 2003. <http://edoc.hu-berlin.de/etd2003/libner-kelsey/HTML/index.html>

John H. Hagen, Susanne Dobratz and Peter Schirmbacher, "Electronic theses and dissertations worldwide: highlights of the ETD 2003 symposium." *D-Lib Magazine*, 9(7/8), July/August 2003.
<http://www.dlib.org/dlib/july03/hagen/07hagen.html>

3.3 Preservation metadata

There have been several developments and publications in the area of preservation metadata.

The National Library of New Zealand released a revised version of its preservation metadata schema in June, incorporating advances gleaned from experience and in compliance with emerging standards, and in July released the data model for a preservation metadata process, which will move towards implementation of a metadata repository.

ERPANET held a training seminar on metadata in digital preservation, in Marburg, Germany, 3-5 September 2003 (see below). The briefing paper for this workshop is available and covers the principles and purposes of metadata, metadata schemes and their structures, metadata sources, cost/benefit aspects and challenges in creation, implementation and interoperability of schemes.

A paper presented by Michael Day at the 2003 Dublin Core Conference in Seattle argued that metadata registries may assist in managing metadata in repositories and may also support the re-use and exchange of metadata and/or information packages. The paper describes the development of metadata schemas by national libraries, research initiatives, recordkeeping institutions and digitisation programs and notes that interoperability between these schemas is desirable. Day suggests that metadata registries may be a useful tool that provide authoritative information on schema and element specifications and inter-scheme mappings. They could possibly also support the re-use of metadata and the exchange of information packages between trusted repositories.

Julien Masanès, Archiving Project Manager at the Bibliothèque nationale de France, highlights in a recent article the need to gather sufficient metadata for future access to digital objects and discusses the classes of preservation metadata described in the Open Archival Information System (OAIS) Reference Model. Covering both Representation

Information (RI), documenting the chain of complex technical requirements to access objects, and Preservation Description Information (PDI), providing identity and integrity information for objects, the article further notes the need to preserve key information about formats themselves and the limitations of presently available sources of this information.

An annotated guide to major metadata resources organised by subject has been produced by the government of Alberta, Canada, to assist in development of its government metadata standards. As well preservation metadata, the guide covers international initiatives, background information, current awareness resources, standards, major metadata schemas and listservs.

National Library of New Zealand, *Introduction to the Metadata Standards Framework for National Library of New Zealand*. Wellington, National Library of New Zealand, updated July 2003.

<http://www.natlib.govt.nz/en/whatsnew/4initiatives.html#meta>

Wendy Duff, Hans Hofman, and Melissa Troemel, "Getting what you want, knowing what you have, and keeping what you need," ERPANET Briefing Paper, August 2003:

www.erpanet.org/www/products/marburg/documents/erpaTraining-Marburg_BriefingPaper.pdf

Michael Day, "Integrating metadata schema registries with digital preservation systems to support interoperability: a proposal," DC-2003 -- 2003 Dublin Core Conference: Supporting Communities of Discourse and Practice - Metadata Research and Applications, Seattle, Wa., USA, 28 September - 2 October 2003:

www.siderean.com/dc2003/101_paper38.pdf

Julien Masanès, "L'information technique nécessaire à la préservation à long terme des documents numériques = Technical information needed for long-term preservation of digital documents," *International Preservation News*, No. 29, May 2003, pp. 11-19:

<http://www.ifla.org/VI/4/news/ipnn29.pdf>

Alberta Government Services Information Management Branch, *Metadata resources guide*. Edmonton, Alberta: Alberta Government Services, April 2003. www.im.gov.ab.ca/public/Metadata%20pathfinder.doc

3.4 File Format Registries

Registries of file formats are proposed to play a key role in supporting preservation metadata efforts, acting as authoritative sources of information on technical characteristics, specifications, version information and potential equivalencies that can be used to identify and manage digital materials.

Efforts towards a global format registry are described in a paper from the 69th IFLA General Council and Conference, held in Berlin in August. This paper also notes the granularity limitations of MIME types to adequately type digital formats for preservation management in repositories and summarises ongoing international efforts to establish a global format registry to maintain persistent, unambiguous bindings between digital format public identifiers and properties.

The Digital Preservation Department at the National Archives of the United Kingdom (formerly the Public Record Office) has developed PRONOM, an application for managing information about the file formats and software applications used to store and render electronic records. The User Requirements for PRONOM 3 were published in June 2003. The National Archives plan to launch the Web version of PRONOM in the autumn of 2003. The PRONOM system was also described in the October 2003 issue of *RLG DigiNews*.

The final report of the File Format Representation and Rendering Project, undertaken by the University of Leeds for the JISC, is also available. The report presents the results of a survey into the sources, availability and accuracy of file format information and how this may affect the development of tools and strategies for digital preservation. The report urgently recommends collection and preservation of both file format documentation that is available on the internet and that is at risk of loss and technical documentation for hardware and software. Further essential recommendations are the establishment of a system for Representation Information (RI), collection of existing tools and development of new ones, establishment of a testbed for strategies and continued collection of documentation and dialogue with developers.

Stephen L. Abrams, and David Seaman, "Towards a global digital format registry," 69th IFLA (International Federation of Library Associations and Institutions) General Conference and Council, Berlin, Germany, 1-9 August 2003: http://www.ifla.org/IV/ifla69/papers/128e-Abrams_Seaman.pdf

PRONOM 3 User Requirements:
<http://www.nationalarchives.gov.uk/aboutapps/pronom/default.htm>
Link updated 14 October 2005

Jeffrey Darlington, "PRONOM - a practical online compendium of file formats" *RLG DigiNews*, 7(5), October 15, 2003.
<http://www.rlg.org/preserv/diginews/diginews7-5.html#feature2>

Representation and Rendering Project, University of Leeds, *Survey and assessment of sources of information on file formats and software documentation: Final report*, London, Joint Information Systems Committee, 2003.
http://www.jisc.ac.uk/uploaded_documents/FileFormatsreport.pdf

3.5 Persistent Identifiers

Persistent identifiers play important roles in the management of digital objects and are considered key components of preservation metadata.

In the June issue of *D-Lib Magazine*, Dr. Norman Paskin, Director of the International DOI Foundation, provides a progress report on DOI, the Digital Object Identifier system: its takeup and usage, developments that have occurred, and current issues and implications of DOI. Version 3.2 of the *DOI Handbook* was released in August by the International DOI Foundation.

Using an alternative scheme, the California Digital Library (CDL) has assigned over 80,000 ARK (Archival Resource Key) identifiers for the digital objects it controls. A recent paper by John Kunze describes how ARK identifiers differ from other schemes and how the California Digital Library uses them. The complete ARK Specification is available via the CDL's ARK identifier page: <http://www.cdlib.org/inside/diglib/ark/>

At a November 2002 meeting, the CORES Project (Information Society Technologies Programme, European Union) passed a resolution to assign Uniform Resource Identifiers (URIs) to metadata elements of several major metadata standards, including DOI, Dublin Core, GILS and ONIX. While the URIs need not be resolvable, they will serve to uniquely and persistently identify the elements and schemes. A July *D-Lib Magazine* article presents the text of the resolution and then summarises the position of organisations that maintain the metadata standards and notes any problems that have emerged in assigning URIs.

Norman Paskin, "DOI: a 2003 progress report" *D-Lib Magazine*, 9(6), June 2003. <http://www.dlib.org/dlib/june03/paskin/06paskin.html>

International DOI Foundation, *The DOI handbook*, Edition 3.2.0, Oxford, International DOI Foundation, August 2003.
<http://www.doi.org/hb.html> (doi:10.1000/186 PDF version)

John A. Kunze, *Towards electronic persistence using ARK identifiers*. Oakland, Calif., California Digital Library, July 2003.
<http://www.cdlib.org/inside/diglib/ark/arkcdl.pdf>

Thomas Baker and Makx Dekkers, "Identifying metadata elements with URIs: the CORES Resolution" *D-Lib Magazine*, 9(7/8), July/August 2003.
<http://www.dlib.org/dlib/july03/baker/07baker.html>

3.6 Web archiving

Various new publications are available in the area of web archiving.

Patrick Panos provides a short introduction to the Internet Archive with details of how to use the "Wayback Machine," concluding that it could be an important tool for social work education research and may assist many social work authors keep their Internet references valid and alive.

Michael Day's paper at ECDL 2003, the 7th European Conference on Research and Advanced Technologies for Digital Libraries, was an evaluation of Web-archiving initiatives to date, focusing on collection strategies and highlighting some generic issues.

The 3rd ECDL Workshop on Web Archives was held in conjunction with ECDL 2003. The full Workshop proceedings are available in PDF. Included are papers on persistent identifiers, the National Library of Norway's Paradigma Web harvesting environment, and the Nordic Web Archive toolset. Other papers include an attempt to characterize the Portuguese Web and reports from the practical experiences of building thematic Web archives and of collecting the Czech Web.

The Smithsonian Institution archives published a report outlining a proposal for a pilot project to archive Smithsonian websites. The report is the result of the evaluation and testing of Dollar Consulting's 2001 report Archival Preservation of Smithsonian Web Resources: Strategies, Principles, and Best Practice. The current report includes proposed recommendations for archival management, access to archived websites, processing of dynamic websites, and notes the results of test migrations of HTML to XHTML, which were based on Dollar Consulting's earlier recommendations.

The National Archives of the United Kingdom announced an initiative to collect and preserve 50 government websites, including those of 10 Downing Street, the Hutton Inquiry and the Northern Ireland Office. Sites are being collected as weekly or 6-monthly snapshots, using a specially-modified version of the Internet Archive's web crawler. The complete archive is being made available on the Web and a copy of each snapshot is also being accessioned for long-term preservation.

Patrick Panos, "TechNotes -- The Internet Archive: an end to the digital dark age" *Journal of Social Work Education (JSWE)*, 39(2), Spring/Summer 2003, 343-347. Available:
www.cswe.org/publications/jswe/03-2technotes.htm

Michael Day, "Preserving the fabric of our lives: a survey of Web preservation initiatives," In: T. Koch & I. T. Sølvsberg, (eds.), *Research and Advanced Technology for Digital Libraries: 7th European Conference, ECDL 2003, Trondheim, Norway, August 17-22, 2003, Proceedings*, (Lecture Notes in Computer Science, 2769), Heidelberg: Springer-Verlag, 2003, pp. 461-472.

3rd ECDL Workshop on Web Archives : in Conjunction with the 7th European Conference on Research and Advanced Technologies for Digital

Libraries (ECDL 2003). Program and presentations available from:
<http://bibnum.bnf.fr/ecdl/2003/index.html>

Smithsonian Institution Archives Records Management Team, *Archiving Smithsonian Websites : an evaluation and recommendation for a Smithsonian Institution Archives Pilot Project*. Washington DC, Smithsonian Institution Archives, May 2003.
www.si.edu/archives/archives/websitepilot.html

The National Archives of the United Kingdom, "UK Government Web Archive," 2003. www.nationalarchives.gov.uk/preservation/webarchive/

3.7 XML as a digital preservation strategy

Several initiatives are progressing with use of XML in their digital preservation efforts.

The Dutch Testbed Digitale Bewaring (Digital Preservation Testbed) has been trialling the use of XML for long-term preservation of electronic records and documents, and recently released several papers. The first provides the Testbed's final recommendations on the long-term preservation of email and covers cultural, legal, technical and practical issues. It also has sections targeted towards specific groups such as managers, record keepers and end users. There is a comparison of migration, emulation and XML as preservation strategies, and the appendices include an XML schema for archiving Outlook emails. The second recent paper is based on the Testbed's presentation at the ERPANET workshop on long-term preservation of databases in Bern, Switzerland, in April 2003. The progress in developing strategies for database preservation is discussed with the XML approach compared to alternative strategies. The Digital Preservation Testbed's XML conversion tool and schema is also considered.

The DiVA (Digitala vetenskapliga arkivet) Project of Uppsala University in Sweden presented a paper at the 6th International Conference on Electronic Theses and Dissertations in Berlin, including discussion of XML as a long-term preservation format. The goal of the project is to create a searchable archive (DiVA Archive) for the long term preservation of electronic theses, essays and working papers. As well as use of XML, the paper discusses the DiVA document format and the use of URN (uniform resource names) as persistent identifiers.

The National Archives of Australia (NAA) released several XML data formats for comment, as part of its Agency to Researcher (AtoR) Digital Preservation Project. The data formats are for use as archival formats for conversion of digital records received from Commonwealth agencies, and NAA welcome comments on their completeness and suitability. While the official period for comments for the currently available formats has passed, late comments may be accepted. Details on the NAA's Agency to Researcher project and the method for transfer of electronic records to the NAA are also available.

Digital Preservation Testbed, *From digital volatility to digital permanence. Preserving email*. The Hague, Digital Preservation Testbed, April 2003. ISBN 90-807758-1-9.

<http://www.digitaleduurzaamheid.nl/bibliotheek/docs/volatility-permanence-email-en.pdf>

Remco Verdegem, "Databases preservation issues" The Hague, Digital Preservation Testbed, 2003.

http://www.digitaleduurzaamheid.nl/bibliotheek/docs/longterm_preservation_of_databases.pdf

Eva Müller, Uwe Klosa, Peter Hansson, Stefan Andersson, Erik Siira, "Using XML for long-term preservation : experiences from the DiVA Project". Paper presented at ETD 2003: 6th International Conference on Electronic Theses and Dissertations - Next Steps: Electronic Theses and Dissertations Worldwide, Berlin, Germany, 21-24 May 2003.

<http://edoc.hu-berlin.de/etd2003/hansson-peter/HTML/index.html>

National Archives of Australia, *XML data formats*. Canberra, National Archives of Australia, June 2003.

naa.gov.au/recordkeeping/preservation/digital/xml_data_formats.html

National Archives of Australia, *Agency to Researcher (AtoR) Digital Preservation Project*. Canberra, National Archives of Australia, 2003.

naa.gov.au/recordkeeping/preservation/digital/summary.html

National Archives of Australia, *How digital records are transferred to the long-term digital repository*. Canberra, National Archives of Australia, 2003.

naa.gov.au/recordkeeping/preservation/digital/digital_repository.html

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3.8 Costs

Two recent articles have explored evaluation of cost models for preservation and compared costs of repository storage:

Shelby Sanett, "Cost to preserve authentic electronic records in perpetuity: comparing costs across cost models and cost frameworks" *RLG DigiNews*, 7(4), August 2003. <http://www.rlg.org/preserv/diginews/diginews7-4.html#feature2>

Stephen Chapman, "Counting the costs of digital preservation: is repository storage affordable?" *Journal of Digital Information*, 4(2), May

2003. jodi.ecs.soton.ac.uk/Articles/v04/i02/Chapman/chapman-final.pdf

4. Other recent publications

Two recent articles in Volume 57 of *Advances in Computers* are of note:

Helen R. Tibbo, "On the nature and importance of archiving in the digital age" *Advances in Computers*, 57, 2003, 1-67.

Helen Tibbo of the University of North Carolina at Chapel Hill provides a comprehensive introduction to digital preservation. The first four sections of the article include some definitions of 'archiving,' emphasises the need for collaboration, asks why digital preservation is important, and outlines various preservation challenges - chiefly the proliferation of information and formats, problems with the fragility of media and files, hardware and software obsolescence, and intellectual property rights. The next sections outline some approaches to solving these problems, in particular focusing on activities undertaken within the archives and records domains. Topics discussed include appraisal, authenticity and evidence, metadata (including a quick outline of the OAIS model) and technical preservation. The final section introduces some future challenges. The references contain 251 citations.

Su-Shing Chen, "Preserving digital records and the life cycle of information" *Advances in Computers*, 57, 2003, 69-107.

Following Tibbo's article (described above), Su-Shing Chen of the University of Florida discusses in more detail specific issues relating to digital records - focusing on the life-cycle of information, the OAIS model, migration and security.

Other recent publications:

Fred R. Byers, *Care and handling CDs and DVDs : a guide for librarians and archivists*. Gaithersburg, National Institute of Standards and Technology Digital Preservation Program, May 2003. <http://www.itl.nist.gov/div895/carefordisc/index.html>

This NIST special publication number 500-252 provides care and handling guidelines for those responsible for the long-term preservation of optical discs. The guide examines issues such as cleaning, storage conditions, disc structure and other issues influencing media stability. The guide also includes a glossary.

Howard Falk, "Digital archive developments", *The Electronic Library*, Vol 21, Number 4, 2003, pp. 375-379. Available online to subscribers from <http://www.emerald-library.com/>

This article provides an overview of academic digital archives in the USA and Europe, notes the concerns of journal publishing such as the costs of digital repositories and copyright, and describes worldwide national initiatives and projects to preserve digital materials, including activities of the British Library, Library of Congress, and the National Archives of Australia. Information relating to archiving software is also included.

H. M. Gladney, and J. L. Bennett, "What do we mean by *authentic*? What's the Real McCoy?" *D-Lib Magazine*, 9(7/8), July/August 2003: <http://www.dlib.org/dlib/july03/gladney/07gladney.html>

Henry Gladney examines the problem of defining authenticity. With consideration of the limitations of communication and the ambiguities created by language, Dr Gladney describes a model of object transmission in order to distinguish objective facts from subjective values and opinions, and provides a definition of "authentic" for various object classes, from digital documents through material artefacts to natural objects.

Peter E. Hart, and Ziming Liu, "Trust in the preservation of digital information" *Communications of the ACM* 46(6), June 2003, 93-97.

This article reports on a survey that demonstrated a lack of confidence in the persistence of digital information. In response, the authors - who work for Ricoh Innovations and the San Jose State University - propose that content producers, the IT industry, public agencies, etc. should co-operate to create an 'institutional guarantee' system that would help restore trust.

Margaret Hedstrom, "Research challenges in digital archiving and long-term preservation." Paper presented at *Wave of the Future: NSF Post Digital Library Futures Workshop*, Chatham, Massachusetts, 15-17 June 2003. http://www.sis.pitt.edu/~dlwkshop/paper_hedstrom.html

Examines the future impediments to research created by the deficiencies in current digital archiving and preservation practices. Several areas requiring significant investment in the development of digital archives are highlighted, including the development of software repositories and research on software and dynamic database preservation, the development of self-sustaining storage systems, cost benefit analyses into the performance of storage systems over time, and development of new tools, decision models and scalable infrastructures.

Maggie Jones, "Digital preservation activities in the UK - building the infrastructure," 69th IFLA General Conference and Council, Berlin, Germany, 1-9 August 2003: <http://www.ifla.org/IV/ifla69/papers/129e-Jones.pdf>

Maggie Jones provides an update on the considerable activity in digital preservation in the UK since the JISC/British Library workshop held at the University of Warwick in 1995, and the progress in building an infrastructure to support long-term preservation for digital materials. The paper details initiatives and activities by the CEDARS and CAMiLEON projects, the Joint Information Systems Committee, the British Library, the National Archives and the Digital Preservation Coalition.

B. J. Liu, F. Cao, M. Z. Zhou, G. Mogel, and L. Documet, "Trends in PACS image storage and archive" *Computerized Medical Imaging and Graphics*, 27(2-3), March-June 2003, 165-174.

Medical imaging systems were some of the earliest implementers of digital imaging technologies. This paper - part of a special issue on picture archiving and communication systems (PACS) - looks at design and implementation issues, including the maintenance of data integrity, the provision of back-up services, and the migration of data to new storage media. An abstract is available at: [http://dx.doi.org/10.1016/S0895-6111\(02\)00090-3](http://dx.doi.org/10.1016/S0895-6111(02)00090-3)

"Check out the new library" [interview with Clifford Lynch], *Ubiquity: An ACM IT Magazine and Forum*, 4(23), July/August 2003. Available: http://www.acm.org/ubiquity/interviews/pf/c_lynch_1.html

An interview with Clifford Lynch of the Coalition for Networked Information (CNI); subjects covered include the CNI itself, the 'paperless library,' impediments to digitisation initiatives, and much else. Towards the end, Lynch outlines some of the risks that face digital scholarship (including preservation) and proposes a two layer approach for digital libraries, one based on stewardship, the other on access.

S. G. Proberts, and D. F. Brailsford, "Substituting outline fonts for bitmap fonts in archived PDF files" *Software - Practice and Experience*, 33, 2003, 885-899.

This paper investigates a plug-in to the Adobe Acrobat program that enables bitmap fonts to be substituted by outline fonts to improve the visual quality of Portable Document Format (PDF) files - thus helping to improve the quality of archived PDF files.

Public Record Office Victoria, *Victorian Electronic Records Strategy (VERS): Version 2*. Melbourne: Public Record Office Victoria, July 2003.

www.prov.vic.gov.au/vers/standards/Version%20%20release/StandardVersion2.htm

In July, the Public Record Office Victoria (PROV) (Australia) revised its "Standard for the Management of Electronic Records (PROS 99/007)", commonly referred to as the VERS standard. The five supporting specifications will also be re-released as they are revised, and include metadata, system requirements for preserving electronic records, standard electronic record format, long term preservation formats and export of electronic records to PROV.

Roy Rosenzweig, "Scarcity or abundance? Preserving the past in a digital era," *American Historical Review*, 108(3), June 2003, pp. 735-762. Also available:

<http://chnm.gmu.edu/assets/historyessays/scarcity.html>

A long, well-referenced, paper on digital preservation by a history professor at George Mason University. Rosenzweig uses the sudden (and deliberate) removal of the 'Bart is Evil' Web site after the September 11th attacks as a starting point for a wide-ranging discussion of the role of digital-based information as a historical source.

Bernard Smith, "Preserving tomorrow's memory: preserving digital content for future generations." *International Preservation News*, 29, May 2003, 4-10. Whole issue available at: <http://www.ifla.org/VI/4/news/ipnn29.pdf>

In this short article, the head of the Cultural Heritage Applications Unit in the Information Society Directorate General of the European Commission outlines some of the main challenges and problems of digital preservation and makes some recommendations. The article is based on a presentation given at a seminar on the preservation of the record of science held in Paris, February 2002.

Ani Thakar, Alex Szalay, Peter Kunzt, and Jim Gray, "Migrating a multiterabyte archive from object to relational databases" *IEEE Computing in Science & Engineering*, 5(5), September-October 2003, 16-29. Preprint available in MS Word format:

<http://www.sdss.jhu.edu/ScienceArchive/pubs/cise.doc>

This article, written by scientists from Johns Hopkins University, CERN and Microsoft Research, looks at the migration of the Sloan Digital Sky Survey (SDSS) archive (<http://www.sdss.jhu.edu/>) from an object-oriented database management system to relational database technology. The main reason for migration in this context was to improve performance (rather than preservation) but the article highlights some generic migration issues, most notably the difficulty of translating data models.

Gunter Wabel, "Like Russian dolls: nesting standards for digital preservation", *RLG DigiNews*, 7(3), June 2003. <http://www.rlg.org/preserv/diginews/diginews7-3.html#feature2>

This article discusses three standards for digital preservation, the Open Archival Information System (OAIS), the Metadata Encoding and Transmission Standard (METS) and the NISO Data Dictionary - Technical Metadata for Digital Still Images. The article describes what the standards do and how they can be utilised, noting especially the hierarchical relationship of the three standards, such that the higher level one provides a framework for those below it.

Colin Webb, "Barriers or stepping stones? Impediments to digital archiving and preservation programs" *CLIR Issues*, Number 34, July/August 2003. <http://www.clir.org/pubs/issues/issues34.html#webb>

A brief overview of the impediments that the National Library of Australia has encountered in developing its digital preservation programs, including lack of expertise, costs and a lack of suitable preservation management tools. Mr Webb postulates that these barriers may well appear as stepping stones when viewed retrospectively.

5. Events

5.1 Recent events

DPC Forums - Meeting reports and presentations from the most recent DPC Forums are now available:

5th DPC Forum: Infrastructure and Development, London, 12 March 2003.

<http://www.dpconline.org/graphics/events/dpcforum.html>

Focusing on work in progress to develop infrastructure for digital preservation in the UK, this forum included presentations on the DPC's business plans, the Digital Curation Centre, file format registries and the needs of E-Science, as well as current research in preservation of digital art and e-journals.

6th DPC Forum: Open Source Software and Dynamic Databases, London, 24 June 2003.

<http://www.dpconline.org/graphics/events/24603dpcforum.html>

Presentations in the first session of this forum drew on speakers' practical experiences with Open Source software, including those for implementing institutional repositories. The second session detailed experiences in archiving dynamic databases, including both scientific data and web content.

7th DPC Forum - Archives: Adapting to the Digital Age, Kew, 24 September 2003.

<http://www.dpconline.org/graphics/events/for24sept.html>

The latest forum, held at the National Archives, focused on experiences and particular issues in Electronic Records Management and some more general issues in collection and preservation of digital materials.

ETD 2003: 6th International Conference on Electronic Theses and Dissertations - Next Steps: Electronic Theses and Dissertations Worldwide, Berlin, Germany, 21-24 May 2003.

Programme information and some papers are available from the conference web site: <http://www.hu-berlin.de/ETD2003/>

Proceedings are available from the Humboldt University's [document server](#).

Several of the papers are also noted in the section on electronic theses and dissertations (see above).

2003 Joint Conference on Digital Libraries (JCDL 2003), Houston, Texas, USA, 27-31 May 2003.

Michael Nelson (Old Dominion University) has published a report of the conference in the July/August issue of *D-Lib Magazine* (<http://www.dlib.org/dlib/july03/nelson/07nelson.html>) while the proceedings have been published as: Catherine C. Marshall, Geneva Henry, and Lois Delcambre, (eds.), *Proceedings 2003 Joint Conference on Digital Libraries*, Los Alamitos, Calif.: IEEE Computer Society. ISBN 0-7695-1939-3.

DAVID (Digitale Archivering in Vlaamse Instellingen en Diensten) Conference - e-Archiving for Posterity: Electronic Record Keeping and Long-Term Preservation of Digital Data, Katholieke Universiteit Leuven, Louvain, Belgium, 26 June 2003

Some slide presentations from the conference are available from the DAVID Web pages:
www.antwerpen.be/david/website/eng/text_conference.htm

EUNIS 2003: Beyond the Network, 9th International Conference of European University Information Systems, 2-4 July 2003

Presentation slides from keynote and invited papers are available from the conference Web pages: <http://www2.ic.uva.nl/eunis2003/>

World Library and Information Congress: 69th IFLA (International Federation of Library Associations and Institutions) General Conference and Council, Berlin, Germany, 1-9 August 2003

The programme and full-text of some of the papers delivered at the Conference are available on the IFLA Web pages:

<http://www.ifla.org/IV/ifla69/prog03.htm>

ECDL 2003: 7th European Conference on Research and Advanced Technology for Digital Libraries, Trondheim, Norway, 17-22 August 2003.

Andreas Rauber (Vienna Technical University) has contributed a brief report of ECDL 2003 in the September issue of *D-Lib Magazine* (<http://www.dlib.org/dlib/september03/rauber/09rauber.html>). Slides from the presentations - including those from the invited speakers - are now being made available from the conference Web site (<http://www.ecdl2003.org/presentations.html>).

All papers have been published in Springer's Lecture Notes in Computer Science series: T. Koch & I. T. Sølvsberg, (eds.), *Research and Advanced Technology for Digital Libraries: 7th European Conference, ECDL 2003, Trondheim, Norway, August 17-22, 2003, Proceedings*. (Lecture Notes in Computer Science, 2769). Heidelberg: Springer-Verlag, 2003. ISBN 3-540-40726-X.

3rd ECDL Workshop on Web Archives, Trondheim, Norway, 21 August 2003.

The full-text of all papers delivered at this workshop are now available at: <http://bibnum.bnf.fr/ecdl/2003/>

ERPANET Training Seminars - the briefing papers, presentation slides and other documentation for the two most recent training seminars are now available from the ERPANET Web pages:

Preserving the Web, Kerkira, Greece, 22-24 May, 2003.
www.erpanet.org/www/products/kerkira/Kerkira.htm

Metadata in digital preservation, Marburg, Germany, 3-5 September 2003.
www.erpanet.org/www/products/marburg/marburg.htm

DC-2003 - 2003 Dublin Core Conference, Supporting Communities of Discourse and Practice - Metadata Research & Applications, Seattle, Washington, USA, 28-September - 2 October 2003

Papers from DC-2003 are now available from the conference Web pages:
dc2003.ischool.washington.edu/

5.2 Forthcoming Events

2003

November:

Museum Computer Network, MCN Annual Meeting, Las Vegas, Nevada, USA, 5-8 November 2003

<http://www.mcn.edu/Mcn2003/index.html>

'Parallel lives' - Digital and Analog Options for Access and Preservation, Joint conference of the National Preservation Office and King's College London, British Library Conference Centre, London, 10 November 2003
www.bl.uk/services/preservation/conf03.html

Accademia nazionale dei Lincei/ERPANET Workshop on Trusted Digital Repositories for Cultural Digital Heritage, Accademia nazionale dei Lincei, Rome, Italy, 17-19 Nov 2003
www.erpanet.org/php/Rome/workshop.htm

AMIA Annual Conference 2003, Vancouver, Canada, 18 - 22 Nov 2003
www.amianet.org/04_Annual/Annual.html

December:

ICADL 2003 - 6th International Conference of Asian Digital Libraries: Digital Libraries: Technology and Management of Indigenous Knowledge for Global Access, Kuala Lumpur, Malaysia, 8-11 Dec 2003 ,
www.ftsm.ukm.my/ICADL2003/

ERPANET/CODATA International Archiving Workshop on the Selection, Appraisal and Retention of Digital Scientific Data, Biblioteca Nacional, Lisbon, Portugal, 15-17 Dec 2003
www.erpanet.org/php/Lisbon/workshop.htm

2004

February:

ICDL 2004 - International Conference on Digital Libraries : Knowledge Creation, Preservation, Access and Management, New Delhi, India, 24-27 Feb 2004

<http://www.teriin.org/events/icdl/>

April:

IS&T Archiving Conference, San Antonio, Texas, USA, 20-23 April 2004
<http://www.imaging.org/conferences/archiving2004/>

A more comprehensive list of forthcoming events is available from the PADI Web site:
<http://www.nla.gov.au/padi/format/event.html>
