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A joint service of the **Digital Preservation Coalition** and the [PADI](#) (Preserving Access to Digital Information) gateway

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This is an archived issue of *What's New*.

Also available as a [print-friendly PDF \(235KB\)](#) .

Known problem links in online versions and PDFs are disabled (or updated when the issue was current) but it is not always possible to annotate the amendments in PDFs with a date or other information which may appear in the online version.

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 [pa-diforum-l](#) mailing lists. Additional or related items of interest may also be included.

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1. News from organisations and initiatives

1.1 US National Digital Information Infrastructure and Preservation Program

Version 0.2 of the Technical Architecture for the US National Digital Information Infrastructure and Preservation Program (NDIIPP) has been released for review and comment. The document includes improvements suggested by stakeholders during the previous review, as well as an expansion of goals to include the need for interfaces for transfer of digital objects or whole collections between institutions, and the ability for institutions to take multiple roles simultaneously within the system.

Library of Congress (2004). *Technical architecture for National Digital Information Infrastructure and Preservation Program: version 0.2*. Washington D.C. : Library of Congress, 2004. Retrieved July 13, 2004, from <http://www.digitalpreservation.gov/index.php?nav=3&subnav=12>

In addition, NDIIPP has issued a press release on its partnership with National Science Foundation (NSF) to fund the first grants program for advanced research into preservation of digital materials. Another press release from the NDIIPP announces a joint venture with US universities to explore strategies for the ingest and preservation of digital archives.

Library of Congress press release (14 June 2004) *Digital Preservation Program Launches Research Grants Initiative* Retrieved July 13, 2004, from http://www.digitalpreservation.gov/about/pr_061604.html

Library of Congress press release (8 June 2004) *Library Of Congress Announces Joint Digital Preservation Project With Four Universities* Retrieved July 13, 2004, from http://www.digitalpreservation.gov/about/pr_060904.html

1.2 The Universal Virtual Computer at the National Library of the Netherlands

The Koninklijke Bibliotheek (KB) and IBM have, as part of their joint *LTP-Study*, developed and

described a 'proof of concept' implementation of the

Universal Virtual Computer (UVC)

. The UVC is envisaged as a permanent rendering solution for the e-journals that have been stored in the KB's

e-Depot

(archiving system for electronic publications). Given that most of the journals stored are in PDF format, the UVC project is ultimately interested in developing a tool for rendering these file types. However, because of the time involved to develop operational solutions for a wide range of file types, the task is being approached in stages, with the first stage focused on creating a UVC for images.

In April 2004 the KB and IBM presented the results of the project *Universal Virtual Computer for JPEG*

. This operational tool enables permanent, platform independent access for JPEG images, regardless of future technological changes. The tool may be used to store other file types, such as PDF, but with reduced functionality, with only an image of the material being preserved.

Further details may be found on the KB's Web pages for the Universal Virtual Computer project, retrieved July 13, 2004, at:

http://www.kb.nl/kb/resources/frameset_kb.html?/kb/hrd/dd/dd_onderzoek/uvc_voor_images-en.html

In their report Van Wijngaarden and Oltmans outline in detail the development and practical use of the Universal Virtual Computer (UVC) for images:

Van Wijngaarden, H. and Oltmans, E. (2004). *Digital Preservation and Permanent Access: The UVC for Images*

The Hague, Netherlands :

Koninklijke Bibliotheek, [2004]. Retrieved July 13, 2004, from

http://www.kb.nl/kb/hrd/dd/dd_links_en_publicaties/publicaties/uvc-ist.pdf

1.3 Netpreserve.org (International Internet Preservation Consortium)

Netpreserve.org (International Internet Preservation Consortium) was formed in 2003 to provide a framework for international collaboration on issues regarding archiving and long-term preservation of the Internet publications.

The Consortium is led by the National Library of France and also comprises the national libraries of Australia, Canada, Denmark, Finland, Iceland, Italy, Norway, Sweden, The British Library (UK), The Library of Congress (USA) and the Internet Archive (USA). Netpreserve.org will concentrate on key objectives, such as selecting, collecting, preserving and providing access to Internet content, facilitating international coverage of the archive collections and engaging in international advocacy for Web archiving initiatives.

Six working groups have been established to work on specific topics: Framework, Researchers Requirements, Access Tools, Metrics and Testbed, Deep Web and Content Management.

Netpreserve.org Web site, retrieved July 13, 2004, may be found at: <http://netpreserve.org/about/index.php>

1.4 Danish Internet Preservation Project (Internetbevaringsprojektet)

A report has been issued on The State Library and the Royal Library of Denmark's joint Internet Preservation Project (Internetbevaringsprojektet), covering the period from Oct. 1, 2003 to Feb. 1, 2004. The project focuses on archiving of the Danish Web space and the report analyses strategies applied to ensure long-term accessibility of different file formats.

Clausen, L. L. (2004). *Handling File Formats* Aarhus, Denmark: The State and University Library, 2004. Retrieved July 13, 2004, from <http://www.netarchive.dk/website/publications/FileFormats-2004.pdf>

1.5 UK Web Archiving Consortium

The UK Web Archiving Consortium project's goal is to look into archiving solutions to ensure that invaluable scholarly, cultural and scientific resources published on the UK Web space are not lost for future generations. Six leading institutions, including the British Library, JISC (Joint Information Systems Committee), National Archives, Wellcome Trust and the National Libraries of Scotland and Wales will collaborate on the issues regarding long-term preservation of the UK Web content. Institutions will concentrate on collecting different material, for instance the Wellcome Library will focus on collecting medical sites, the National Library of Wales will collect sites that reflect life in contemporary Wales, while The British Library intends to gather sites of cultural, historical and political importance.

PANDAS software, developed by the National Library of Australia, will be used to carry out the archiving process.

The project will initially run for two years and it is expected that approximately 6,000 Web sites will be collected and archived during this time.

The UK Web Archiving Consortium Web site, retrieved July 13, 2004, may be found at: <http://www.webarchive.org.uk>

1.6 The UK Digital Curation Centre

Start up activities for the UK Digital Curation Centre have commenced, in preparation for the Centre's formal launch in October, 2004. The Centre's Web site was recently launched and provides information about the Centre and its partners, its aims, programs and research agenda, as well as news and events. The Helpdesk service is also in operation and activities to follow will include creation of a Web portal, an e-journal, an advisory service, promotion and

outreach programs and the development of registries, testbeds and tools.

Funding for the Digital Curation Centre began on 1 March 2004. The Centre will be run by a consortium comprising the Universities of Edinburgh and Glasgow, UKOLN at the University of Bath and the Council for the Central Laboratory of the Research Councils (CCLRC). The role of the Centre will be to support UK institutions in storage, management and preservation of digital data across the life-cycle of scholarly interest, while supporting reproducibility and re-use and with attention to data provenance. The Centre will also establish a research program on wider digital curation issues, promote links across the existing community of practice and develop services to evaluate tools and technical information.

The Digital Curation Centre Web site, retrieved July 13, 2004, may be found at: <http://www.dcc.ac.uk/>

1.7 The UK Digital Preservation Coalition

The second in the Digital Preservation Coalition's Technology Watch Report series has been released, entitled *Institutional Repositories in the Context of Digital Preservation*, written by Paul Wheatley. A description of the report and a link to the document are included in the Digital Repositories and E-publications section, [below](#).

The National Archives has been announced as the winner of the 2004 Digital Preservation Award at the Awards Ceremony held at the British Library on 22nd June 2004. The National Archives won the award for their Digital Archive initiative. The shortlist of applicants were:

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

Further details are available from the Digital Preservation Coalition's Web site, retrieved July 13, 2004, at:

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

2. Activities and Outcomes

2.1 Digital Repositories and E-Publications

The topic of repositories again features prominently among recent activities and publications.

Ware (2004) reviews the recent developments in institutional repositories and explores the impact that their expansion may have on scholarly publishing, Crow (2004) provides a second edition of his guide to institutional repository software, and ERPANET devotes its Topic of the Month page for March 2004 to repositories.

In the second of the Digital Preservation Coalition's Technology Watch Report series, Wheatley (2004) focuses on the crucial digital preservation issues for institutional repositories. He outlines the requirements for effective preservation - that over the long term data can be maintained, found and delivered to users, and be interpreted and understood - and the preservation functions required in a repository to achieve these: persistent identification, object characterisation and metadata creation during ingest, and maintenance of representation systems to support object rendering. Support for digital preservation functions in current repository software is examined and careful consideration and further development in support of digital preservation needs is recommended.

Johan Steenbakkers (2004) describes the development, infrastructure and growth of the e-Depot system at the Koninklijke Bibliotheek, the National Library of the Netherlands, which, through formal archiving agreements with Elsevier Science, Kluwer Academic and Biomed

Central, takes on a global role in permanently safeguarding these publishers' e-publications. Based on the OAIS Reference Model, the Digital Information Archiving System (DIAS), which forms the core of e-Depot, is capable of ingesting over 60,000 articles per day, and is expected to achieve total holdings of 4.5 million e-journal articles in 2004. Research into long-term preservation strategies and preservation functions described in the OAIS Reference Model has led to the development of a Preservation Management component of an envisaged Preservation Subsystem, and a permanent access tool for viewing images, based on the Universal Virtual Computer concept.

The February 2004 issue of *High Energy Physics Libraries Webzine* featured a number of articles on institutional repositories.

Harboe-Ree and Treloar (2004) argue for a collaborative, integrated approach to institutional repositories within Australian institutions, note the roles that Australian university libraries may adopt, and provide background and overviews of the four national collaborative repository projects recently funded by the Australian Department of Education Science and Technology: the Australian Digital Theses Program Expansion and Redevelopment (ADT) project; the Australian Research Repositories Online to the World (ARROW) project; the Towards an Australian Partnership for Sustainable Repositories (APSR) project; and the Meta Access Management Systems (MAMS) project.

MacKenzie Smith (2004) describes the implementation and lessons learned after almost a year of running DSpace as a service at MIT Libraries. Faculty acceptance towards deposit and open access has seen an increase in the growth of the repository's contents and a valuable increase in accessibility to research documents previously hidden in the 'grey literature'. A brief description of the DSpace information model and metadata creation is included.

Beier and Velden (2004) describe the eDoc-Server project, aimed at providing a central service and software system for use across various disciplines within the eighty institutions of the Max Planck Society. Two usage scenarios are supported: eDoc Archival, which is widely used to archive and disseminate research results and publications, and eDoc Primary Sources, which is in the early stages of development and seeks to archive primary source material (images, data sets, etc.). Workflow, version control, metadata, genre types and files formats, level of preservation support, user interfaces and the technology platform are described, as are the project's challenges for the future.

In another recent publication, Jones (2004) details an evaluation of two open source packages to support development of an Electronic Theses and Dissertations (ETD) repository for UK institutions, undertaken as part of the *Theses Alive!* Project at Edinburgh University Library. The evaluation compared ETD-db, designed by Virginia Tech specifically for authoring of E-theses, and the Hewlett-Packard and MIT collaboration, DSpace, which is designed to aid creation of institutional repositories, in order to determine whether either package could provide all or part of a solution for a UK ETD repository service. The packages were compared on aspects of submission procedures, archiving and access, and administration and security, with the finding that, in this case, DSpace is better suited to the project's needs.

Beier, G. and Velden, T. (2004). "The eDoc-Server project: building an institutional repository for the Max Planck Society." *High Energy Physics Libraries Webzine*, Issue 9, February 2004. Retrieved July 13, 2004, from <http://library.cern.ch/HEPLW/9/papers/4/>

Crow, R. (2004) *A Guide to Institutional Repository Software*. 2nd ed. New York : Open Society Institute, 2004. Retrieved July 13, 2004, from www.soros.org/openaccess/pdf/OSI_Guide_to_Institutional_Repository_Software_v2.pdf

ERPANET Topic of the Month : March 2004: Repositories. Retrieved July 13, 2004, from <http://www.erpanet.org/www/products/topic/digitalrepositories.htm>

Harboe-Ree, C. and Treloar, A. (2004). "Connecting the dots downunder: towards an integrated institutional approach to digital content management." *High Energy Physics Libraries Webzine*, Issue 9, February 2004. Retrieved July 13, 2004, from <http://library.cern.ch/HEPLW/9/papers/1/>

Jones, R. (2004) "DSpace vs. ETD-db: choosing software to manage electronic theses and dissertations". *Ariadne*, Issue 38, January 2004. Retrieved July 13, 2004, from <http://www.ariadne.ac.uk/issue38/jones/>

Smith, M. (2004). "DSpace for e-print archives." *High Energy Physics Libraries Webzine*, Issue 9, February 2004. Retrieved July 13, 2004, from <http://library.cern.ch/HEPLW/9/papers/3/>

Steenbakkens, J. F. (2004). "Treasuring the digital records of science: archiving e-journals at the Koninklijke Bibliotheek" *RLG DigiNews* 8(2), April 15 2004. Retrieved July 13, 2004, from http://www.rlg.org/en/page.php?Page_ID=17068#article0

Ware, M. (2004). "Institutional repositories and scholarly publishing." *Learned Publishing* 17(2):115-124, April 2004.

Wheatley, P. (2004). *Institutional Repositories in the Context of Digital Preservation. DPC Technology Watch Series Report 04-02*. University of Leeds and Digital Preservation Coalition, March 2004. Retrieved July 13, 2004, from <http://www.dpconline.org/docs/DPCTWf4word.pdf>

2.2 Preservation of Digital and Variable Media Art

Variable media art, including digital, electronic, interactive and installation art is the focus of several preservation projects.

The Variable Media Network is a collaboration between cultural organisations including the Guggenheim Museum, to preserve variable media artworks by adapting preservation concepts such as migration and emulation within the context of installation art. Not restricted to digital artworks alone, the Network focuses on working with artists to capture the key ideas of a work and to define ways in which works may be re-interpreted in the future that are acceptable to the artist. A recent publication by Depocas *et al.* (2003) details and demonstrates the Networks's approach with a number of case studies.

Supported by the Daniel Langlois Foundation, the Guggenheim Museum (2004) presented from 19 March to 16 May 2004 the exhibition "Seeing Double: Emulation in Theory and Practice", which pairs original art installations with emulated versions. An online version of the exhibition is available on the Variable Media Network Web site.

The V2_Organisation (2004), a Rotterdam-based centre for culture and technology, used two major electronic art projects as case studies to focus on the documentation aspects of preserving electronic art. The research project, "Capturing Unstable Media", is funded by the Mondriaan Foundation and the Daniel Langlois Foundation. The project results were made available in March and resulted in a series of recommendations on documentation strategies for electronic art, formal modelling and metadata, and archive interoperability.

Also available are the results of the PANIC project (Preservation and Archival New Media and Interactive Collections), a similar research project undertaken by MAENAD (Multimedia Access across Enterprises, Networks and Domains) (2004) at the Australian Distributed Systems Technology Centre. The project had several objectives, including using case studies to compare various approaches to multimedia preservation, investigating ways to ensure longevity of the access to multimedia objects, determining optimum media formats and developing guidelines and metadata schemas for multimedia creators. Along with the case studies, results of the investigations include a preservation metadata schema and input tool, based on METS and MODS and informed by the work of the Variable Media Initiative.

The development of the Database of Virtual Art at Humboldt University in Berlin, and the detailed documentation collected about works on the database are described in an article by Grau (2003). Supported by the German Research Foundation (DFG) and the Federal Ministry of Education and Science (BMBF), the Database has been developed to document and provide access to digital installation art. Its documentation system focuses on information about technical requirements, installation settings, and software and hardware configurations, and has a Web interface to allow artists to contribute directly to the Database.

Database of Virtual Art, retrieved July 13, 2004, may be found at:
<http://virtualart.hu-berlin.de/list.do>

Depocas, A., Ippolito J. and Jones, C. (2003). *The variable media approach: permanence through change*. New York : Guggenheim Museum Publications, 2003. [ISBN 0-9684693-2-9]. Retrieved July 13, 2004, from <http://www.variablemedia.net/pdf/Permanence.pdf>

Grau, O. (2003). *Database of Virtual Art for an Expanded Concept of Documentation*. Berlin:

Humboldt University, 2003. Retrieved July 13, 2004, from <http://www2.hu-berlin.de/grau/database.htm>

MAENAD (2004) *PANIC Project: Preservation and Archival New Media and Interactive Collections*. Brisbane : Distributed Systems Technology Centre, 2004. Retrieved July 13, 2004, from <http://metadata.net/newmedia/>

Solomon R Guggenheim Museum (2004). *Seeing Double: Emulation in Theory and Practice*, 19 March to 16 May 2004. Retrieved July 13, 2004, from <http://www.variablemedia.net/e/seeingdouble/home.html>

Variable Media Network Web site. Retrieved July 13, 2004, from <http://www.variablemedia.net/>

V2_Organisation (2004) *Capturing Unstable Media*. Rotterdam : V2_Organisation, 2004. Retrieved July 13, 2004, from <http://www.v2.nl/Projects/capturing/>

2.3 Metadata

Technical Metadata for Digital Still Images

An updated version of the RLG white paper *Automatic Exposure: Capturing Technical Metadata for Digital Still Images* has been released (2004) and includes revisions based on input from community experts. The study reviews technical metadata creation by hardware capture devices and metadata harvesting tools developed by various institutions to implement the NISO draft standard Z39.87, and presents the results of a survey into preferred storage locations of captured metadata, either within the image files or in external metadata files. The survey indicated a need to identify a mechanism which both puts the metadata into the image file itself and provides for its import into a database system.

Research Libraries Group (2004). *Automatic Exposure: Capturing Technical Metadata for Digital Still Images*. Mountain View, CA : Research Libraries Group, 2004. Retrieved July 13, 2004, from http://www.rlg.org/longterm/ae_whitepaper_2003.pdf

PREMIS

Brian Lavoie (2004) describes the work of the PREMIS group (PREservation Metadata Implementation Strategies) in a recent article in *D-Lib Magazine*. The group is due to finalise its activities in June 2004, and, to that end, activities of the Core Elements subgroup, will focus on finalising its recommended set of core preservation metadata elements, and creating a data dictionary and associated XML schema to support their practical use. Activities of the Implementation Strategies subgroup will include publishing the summary results of the recent implementation survey, to be followed by studies to identify and evaluate implementation strategies already in use in the community, in the context of the core element set.

Lavoie, B. F. (2004). "Implementing metadata in digital preservation systems: the PREMIS activity." *D-Lib Magazine*, 10(4), April 2004. Retrieved July 13, 2004, from <http://www.dlib.org/dlib/april04/lavoie/04lavoie.html>

2.4 Web Archiving

Several articles related to activities in Web archiving are available.

Hanley (2004) provides an overview of the practical aspects of the archiving process undertaken by the PADI Safekeeping project at the National Library of Australia, which seeks to preserve significant digital preservation resources using the PANDAS Web archiving system.

Rein (2004) presents an interview with Brewster Kahle on the history, philosophy and experiences of the Internet Archive, in which he comments, among other topics, on ways in which sites could be made "more archivable". The role of the Internet Archive is also discussed in an article by Edwards (2004).

The importance of HTML compliance and validation of published resources to enable wide accessibility is noted by Kelly (2004), who introduces a method using logs to prioritise HTML quality improvements for a Web site's most popular non-compliant pages.

Christensen-Dalsgaard (2004) analyses Web archiving activities in Denmark, including a brief history of legal deposit for digital material, as well as the related Web harvesting experiments. Web archiving strategic and technical issues are examined in detail.

Christensen-Dalsgaard, B. (2004). "Web Archive Activities in Denmark" *RLG DigiNews*, 8(3), 15 June 2004. Retrieved July 13, 2004, from http://www.rlg.org/en/page.php?Page_ID=17661#article0

Edwards, E. (2004). "Ephemeral to enduring: the Internet archive and its role in preserving digital media." *Information Technology and Libraries*, 23(1), 3-8.

Hanley, M. (2004). "PADI (Preserving Access to Digital Information) and Safekeeping." *High Energy Physics Libraries Webzine*, Issue 9, February 2004. Retrieved July 13, 2004, from <http://library.cern.ch/HEPLW/9/papers/2/>

Kelly, B. (2004). "Web focus: improving the quality of your HTML." *Ariadne*, Issue 38, January 2004. Retrieved July 13, 2004, from <http://www.ariadne.ac.uk/issue38/web-focus/>

Rein, L. (2004). "Brewster Kahle on the Internet Archive and People's Technology." *OpenP2P.com*, 22 January 2004. Retrieved July 13, 2004, from

<http://www.openp2p.com/pub/a/p2p/2004/01/22/kahle.html>

2.5 Copyright Issues

Further papers are available on the work of the Copyright and Licensing for Digital Preservation (CLDP) project at Loughborough University, which ran from September 2002 to March 2004. The project looked at the rights implications of digital preservation methods and legal barriers to preservation, and sought ways to overcome them.

Ayre, C. and Muir, A. (2004). "The right to preserve: the rights issues of digital preservation." *D-Lib Magazine* 10(3), March 2004. Retrieved July 13, 2004, from <http://www.dlib.org/dlib/march04/ayre/03ayre.html>

Muir, A. (2004). "Digital preservation: awareness, responsibility and rights issues." *Journal of Information Science* 30(1): 73-92, February 2004.

In addition, copyright and legal deposit have been a topic of a number of articles. Legal issues regarding depositing as well as automatic harvesting of the digital material are investigated from the country specific point of view.

Charlesworth (2003) examines legal constraints concerning Web archiving in the UK . He analyses different approaches that EU countries, Australia and the US have taken in order deal with the legal implications of the archiving of the Web. EU countries have established legal deposit, while the US and Australia do not have such legal clarity and have to deal with copyright issues on a case-by case basis.

Harris (2004) analyses implications of the introduction of the Legal Deposit Libraries Act 2003 in

the UK. To comply with the act publishers are required to deposit electronic material with the UK library system. The article also touches on other similar legislation in other European countries.

Olsen (2004) raises concerns regarding the United States Federal Depository Program's failure to preserve all government electronic publications. He warns that since these publications are not deposited via the existing library deposit legislation they are at a risk of being permanently lost for the community.

Charlesworth, A. (2003). "Legal Issues Relating to the Archiving of Internet Resources in the UK, EU, USA and Australia: a Study Undertaken for the JISC and Wellcome Trust". Retrieved July 13, 2004, from http://www.jisc.ac.uk/uploaded_documents/archiving_legal.pdf

Harris, S. (2004). "New Legal Deposit Laws Include Digital Data". Retrieved July 13, 2004, from <http://www.researchinformation.info/rimayjun04/legaldeposit.html>

Olsen, F. (2004). "Crisis for Web Preservation ". Retrieved July 13, 2004, from <http://www.fcw.com/fcw/articles/2004/0621/pol-crisis-06-21-04.asp>

2.6 Optical Disc Longevity

Two recent industry news articles by Applefeld Olsen (2004) and Fist (2004) report the progress of investigations by the US National Institute for Standards and Technology (NIST) into standards for reliable long-term storage media, including DVD.

NIST's recommendations for handling, storage and labelling of optical discs are presented in a quick reference guide available from their Web site (NIST, 2004).

Applefeld Olsen, C. (2004). "NIST unit to set criteria for 'archive-grade' DVDs". *Inside Digital TV*, January 2004. Retrieved July 13, 2004, from:
http://digitaltelevision.com/articles/article_47.shtml

Fist, S. (2004). "Another not-so-permanent archive". *Australian IT*, 2 March 2004. Retrieved July 13, 2004, from
<http://australianit.news.com.au/articles/0,7204,8836696%5E15418%5E%5Enbv%5E15309,00.html>

National Institute of Standards and Technology (2004). *Digital Data Preservation Program: CD and DVD Archiving: Quick Reference Guide for Care and Handling*. Gaithersburg, MD : National Institute of Standards and Technology, 2004. Retrieved July 13, 2004, from:
<http://www.itl.nist.gov/div895/carefordisc/discicare.html>

2.7 Scientific Data

Long-term preservation, access and management of scientific data featured in a few recent articles.

The final report by Lord and Macdonald (2003) on the curation of digital research data within the UK e-Science context, prepared for the JISC Committee for the Support of Research (JCSR), is now available.

Burnhill also discusses curation of digital scientific data in his article on Digital Curation Centre in the UK. He critically examines issues regarding scholarly data, providing a description of the key objectives of the centre and an overview of the DCC's main research priorities.

The final report from the University of Virginia on their Supporting Digital Scholarship project

provides a different angle on long-term accessibility of scientific projects, focusing on cooperation between creators and the collectors. Legal and policy matters are discussed in detail, including analysis of aspects of preservation metadata.

In addition, ERPANET / CODATA Workshop held at the Biblioteca Nacional, Lisbon, 15-17 December 2003 focused on the selection, appraisal and retention of digital scientific data. Both the official ERPANET report on the event (ERPANET, 2004) and Day's detailed analysis of the presentations held (Day, 2004) are now available.

Burnhill, P. (2004). "Digital Curation: Should we be Prepared to Face a Future Without Digital Curation?" *Research Information*, Issue 11, May/June 2004. Retrieved July 13, 2004, from: <http://www.researchinformation.info/rimayjun04digitalcuration.html>

Day, M. (2004). "The Selection, Appraisal and Retention of Digital Scientific Data: the ERPANET / CODATA workshop". *Ariadne*, Issue 39, April 2004. Retrieved July 13, 2004, from: <http://www.ariadne.ac.uk/issue39/erpanet-rpt/>

ERPANET (2003). *The Selection, Appraisal and Retention of Digital Scientific Data: Final Report*. Lisbon : Biblioteca Nacional, 2003. Retrieved July 13, 2004, from: <http://www.erpanet.org/www/products/lisbon/LisbonReportFinal.pdf>

Institute for Advanced Technology in the Humanities, University of Virginia (2004). *SDS Final Report*. Charlottesville, VA : University of Virginia, 2004. Retrieved July 13, 2004, from: http://www.iath.virginia.edu/sds/SDS_AR_2003.html

Lord, P. and Macdonald, A. (2003). *E-Science Curation Report: Data Curation for E-Science in the UK: an Audit to Establish Requirements for Future Curation and Provision*. Twickenham : Digital Archiving Consultancy, 2003. Retrieved July 13, 2004, from: http://www.jisc.ac.uk/uploaded_documents/e-ScienceReportFinal.pdf

3. Other Recent Publications

Digital preservation and libraries was the topic of a special issue of *VINE*, which featured articles on digital preservation activities by experts from a range of institutions worldwide:

Caplan, P. (2004). "Building a digital preservation archive: tales from the front." *VINE* 34(1): 38-42.

Cordeiro, M. I. (2004). "From rescue to long-term maintenance: preservation as a core function in the management of digital assets." *VINE* 34(1): 6-16.

Lawson, D. and Spies, P. B. (2004). "Developing a trusted digital repository: the OCLC experience." *VINE* 34(1): 27-32.

Oltmans, E. and Van Wijngaarden, H. (2004). "Digital preservation in practice: the e-Depot at the Koninklijke Bibliotheek." *VINE* 34(1): 21-26.

Semple, N. (2004). "Developing a digital preservation strategy at Edinburgh University Library." *VINE* 34(1): 33-37.

Woodyard, D. (2004). "Significant property: digital preservation at the British Library." *VINE* 34(1): 17-20.

Other publications

Bausenbach, A. (2004). "Character sets and character encoding: a brief introduction" *RLG DigiNews* 8(2), April 15 2004. Retrieved July 13, 2004, from http://www.rlg.org/en/page.php?Page_ID=17068#article2

Bellinger, M., Kircher, P., Surface, T., & Houser, L. (2004) "OCLC's digital preservation program for the next generation library". *Advances in Librarianship* 27, 25-48.

Defines the third generation digital library and introduces the OCLC Digital Archive.

Dale, R. (2004) "Consortial actions and collaborative environments: RLG's preservation program". *Advances in Librarianship* 27, 1-23.

Describes RLG's preservation activities since the 1970s, including its digital preservation initiatives.

Darlington, J. (2004). "A national archive of datasets." *Ariadne*, 39, April 2004. Retrieved July 13, 2004, from <http://www.ariadne.ac.uk/issue39/ndad/>

Provides overviews for a range of current standards in information management, including standards for identifiers, metadata and information resource sharing and search and retrieval, and covers each standard's purpose, sponsoring agency, stage of development and pros and cons. Each standard is presented by an expert author.

Galloway, P. (2004). "Preservation of digital objects". *Annual Review of Information Science and Technology* 38, 549-590.

Review article of recent research and development. Topics include: practical examples, stakeholders, recent research, trusted repositories, preservation strategies, metadata standards, and a look at future directions.

Grotke, R. W. (2004). "Digitizing the world's largest collection of natural sounds: key factors to consider when transferring analog-based audio materials to digital formats." *RLG DigiNews* 8(1), February 2004. Retrieved July 13, 2004, from http://www.rlg.org/preserv/diginews/v8_n1_feature1.html

This article provides an overview of steps undertaken by the the Macaulay Library of Natural Sounds at Cornell University in converting its analog tape-based sound collection to digital storage and describes the Library's choices in digital media and data format selection, quality standards for data creation, monitoring of the archive and long-term storage.

Guy, M., Powell, A. and Day, M. (2004). "Improving the quality of metadata in Eprint archives." *Ariadne*, Issue 38, January 2004. Retrieved July 13, 2004, from <http://www.ariadne.ac.uk/issue38/guy/>

Kalbitzer, S. (2004). "Novel concepts for mass storage of archival data". *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 218, 343-354.

This paper is looking at the use of ion beams of heavy rare gases for the compact 'write-once' recording of digital data.

Paterson, N. (2004). Museum of Software Project Web site. Fyfe: St Andrews University, School of Computer Science, 2004. Retrieved July 13, 2004, from: <http://mos.dcs.st-and.ac.uk>

The School of Computer Science at the University of St Andrews have announced the start of a project to establish a Museum of Software. While still in the early stages and seeking funding, the statements of values, vision and mission for the project may be found on the project Web site. A mailing list for updates on the project is also available.

Seaman, D. (2004) "The Global Digital Format Registry." *CLIR Issues*, 37, January/February 2004. Retrieved July 13, 2004, from

<http://www.clir.org/pubs/issues/issues37.html#reg>

Various authors (2004) "A Dozen Primers on Standards". *Computers in Libraries*, 24(2), February 2004. Retrieved July 13, 2004, from
<http://www.infotoday.com/cilmag/feb04/primers.shtml>

4. Events

4.1 Recent Events

Breaking Boundaries: Integration and Interoperability - 12th Biennial Conference and Exhibition of the Victorian Association for Library Automation (VALA 2004).

Papers from VALA 2004, held in Melbourne, Australia on 3-5 February 2004, are now available from the conference Web site. Keynote speakers included MacKenzie Smith (MIT Libraries), Herbert Van de Sompel (Los Alamos National Laboratory), Catherine Lupovici (Bibliothèque nationale de France) and Lorcan Dempsey (OCLC). A selection of papers from the conference include:

Pearce, J. and Berko, M.(2004). "The hybrid library revisited" Paper presented at VALA 2004: Breaking boundaries: integration and interoperability, 12th biennial conference and exhibition of the Victorian Association for Library Automation, 3-5 February 2004. Retrieved July 13, 2004, from
<http://www.vala.org.au/vala2004/2004pdfs/53PeaBer.PDF>

Quenault, H. (2004). "VERS: building a digital record heritage." Paper presented at VALA 2004: Breaking boundaries: integration and interoperability, 12th biennial conference and exhibition of the Victorian Association for Library Automation, 3-5 February 2004. Retrieved July 13, 2004,

from

<http://www.vala.org.au/vala2004/2004pdfs/13Quena.PDF>

Sokvitne, L. (2004). "STORS: the development and implementation of a multi-function Open Archive service for Tasmanian electronic documents" Paper presented at VALA 2004: Breaking boundaries: integration and interoperability, 12th biennial conference and exhibition of the Victorian Association for Library Automation, 3-5 February 2004. Retrieved July 13, 2004, from <http://www.vala.org.au/vala2004/2004pdfs/12Sokvit.PDF>

Proceedings of the conference are to be published shortly. The VALA 2004 conference Web Site, retrieved July 13, 2004, may be found at <http://www.vala.org.au/conf2004.htm>

Preservation and Access for Electronic College and University Records (ECURE 2004)

Speaker's presentations from the ECURE 2004 Conference, held in Tempe, Arizona, USA, on 1-3 March 2004, retrieved July 13, 2004, may be found at <http://www.asu.edu/ecure/2004/>

The ECURE Conference Web site, including archives of past conferences, retrieved July 13, 2004, is available at: <http://www.asu.edu/it/events/ecure/>

ERPANET events

Briefing papers and presentations are available for recent ERPANET events from the ERPANET Web site:

ERPANET Workshop: Audit and Certification in Digital Preservation, Antwerpen, Belgium, 14-16 April 2004.

Retrieved July 13, 2004, from

<http://www.erpanet.org/www/products/antwerpen/antwerpen.htm>

File Formats for Preservation, ERPANET Training Seminar, Vienna, Austria, 10-11 May 2004.
Retrieved July 13, 2004, from
<http://www.erpanet.org/www/products/vienna/vienna.htm>

Presentations are also available from the following events:

Museums and the Web 2004, Arlington, Virginia, USA, 31 March - 3 April 2004.
Retrieved July 13, 2004, from <http://www.archimuse.com/mw2004/sessions/>

13th International World Wide Web Conference, New York, USA, 17-22 May 2004.
Retrieved July 13, 2004, from <http://www2004.org/>

4.2 Forthcoming Events

July:

AusWeb04: The Tenth Australian World Wide Web Conference, Gold Coast, Queensland, Australia, 3-7 July 2004.
Retrieved July 13, 2004, from <http://ausweb.scu.edu.au/aw04/conf/>

Joint Information Systems Committee/Coalition for Networked Information Meeting 2004, Brighton, UK, 8-9 July 2004.
Retrieved July 13, 2004, from <http://www.ukoln.ac.uk/events/jisc-cni-2004/>

Digital Preservation Management: Short-Term Solutions to Long-Term Problems, 2004, Ithaca,

New York, US, 19 - 23 July 2004.

Retrieved July 13, 2004, from <http://www.library.cornell.edu/iris/dpworkshop/>

August:

ISEA 2004: the 12th International Symposium on Electronic Art , Scandanavia - various locations - see URL for details, 14 - 22 August 2004.

Retrieved July 13, 2004, from <http://www.isea2004.net/>

Collecting and Managing Web Resources for Long-Term Access : Web Harvesting and Guidelines to Support Preservation (ICABS Actions 3.3 and 3.4) , Buenos Aires, Argentina , 22 - 27 August 2004.

Retrieved July 13, 2004, from <http://www.ifla.org/IV/ifla70/prog04.htm>

International Congress on Archives 2004 : Archives, Memory and Knowledge, Vienna Austria, 23 - 29 August 2004.

Retrieved July 13, 2004, from <http://www.wien2004.ica.org/fo/index.php>

September:

ECDL 2004 : European Digital Library Conference 2004, Bath, UK, 12 - 17 September 2004.

Retrieved July 13, 2004, from <http://www.ecdl2004.org/>

4th International Web Archiving Workshop (IWAW04), Bath, UK, 16 September 2004.

Retrieved July 13, 2004, from <http://www.iwaw.net/04/callforpapers.html>

October:

Ensuring the Long-Term Preservation and Adding Value to the Scientific and Technical Data, Frascati, Italy, 05 - 07 October 2004.

Retrieved July 13, 2004, from <http://www.congrex.nl/04a08/>

Optical Storage Symposium 2004, San Francisco, United States of America, 18 - 19 October, 2004.

Retrieved July 13, 2004, from <http://www.osta.org/oss/index.htm>

November:

Archiving Web Resources : Issues for Cultural Heritage Institutions : International Conference, Canberra, Australia, 09 - 11 November 2004.

Retrieved July 13, 2004, from <http://www.nla.gov.au/webarchiving/>

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

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