

DPC What's new in digital preservation

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This is a summary of selected recent activity in the field of digital preservation compiled from a number of resources including the [digital-preservation](#) and [padiforum-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 Digital Preservation Coalition (DPC)

A new Technology Watch Report was published by the DPC in May. The report is designed for repository managers and archivists who may be expected to preserve and manage geospatial data but don't have a background in geospatial sciences. The report provides an advanced introduction to the often daunting world of geospatial data management and it supports efforts to ensure that these valuable and complex data sets can be secured for future generations.

McGarva, G., Morris, S., & Janee, G (2009) *Preserving Geospatial Data*. DPC Technology Watch Series Report 09-01. <http://www.dpconline.org/docs/reports/dpctw09-01.pdf>

May also saw the DPC sponsor two students to attend the **Digital Preservation Training Programme (DPTP)** run by the ULCC. DPTP is designed for all those working in institutional information management who are grappling with fundamental issues of digital preservation. A panel of judges selected Grant Young, Digital Preservation Specialist at Cambridge University Library and Vicky Phillips, Digital Standards Manager at Llyfrgell Genedlaethol Cymru / National Library of Wales from a strong shortlist. Applications were open to DPC members and associates.

For more information on the DPC programme of scholarships see:
<http://www.dpconline.org/graphics/training/>

In July the DPC sponsored and organised the **missing links: the enduring web** workshop. In conjunction with the JISC and the six partners of the UK Web Archiving Consortium (British Library, National Library of Wales, JISC, Wellcome Library, The National Archives and the National Library of Scotland) this event brought together content creators and tool developers with key stakeholders from the library and archives domains. Attended by over 100 delegates the event addressed technical, social and historically acceptable preservation issues surrounding the 'enduring Web'. An extended report of the event, with links to discussion pieces and reflections from participants on what they have learned is available online at:

<http://www.dpconline.org/graphics/events/090721MissingLinks.html>

A further two events in a series of Roadshows organised by the **Society of Archives** and sponsored by **DPC, The National Archives (TNA), Planets** and **Cymal** were held at the Borthwick University of York in June and Wellcome Trust, London in August. The events aim to raise awareness of the issues, to demonstrate that there are solutions that don't involve spending large amounts of money, and to show how to take the first, small, incremental steps in this field. Presentations are available on the DPC website along with details for forthcoming Roadshows.

<http://www.dpconline.org/graphics/events/09-10roadshows.html>

During the last five months the DPC was represented at a number of events and various presentations have been given. These include: Research Information Network meeting in Crewe (May); Alliance for Permanent Access Board Meeting in Den Haag (May); ARCW meeting in Aberystwyth (June); JISC Collections Conference (June); DCC 'Face to Face' Meeting in Glasgow (July); Islamic Manuscript Association Conference in Cambridge (July); HEIRNet meeting in York (July); SCA/DCC/JISC/PRONI Workshop, Belfast (September); PARSE Insight workshop in Darmstadt (September) and JISC Digital Media Seminar in Bristol (September).

The DPC continues to grow, and has recently welcomed a new associate member, English Heritage.

1.2 Digital Curation Centre (DCC)

A DCC Charter and Statement of Principles has been published which sets out a definition of digital curation, reasons for curation and preservation, responsibilities, and a separate section on DCC principles. Retrieved 24 September from: <http://www.dcc.ac.uk/charter/>

The DCC has published a new page which provides advice and guidance on the UK funding bodies' curation policies. It summarises the coverage of the policies for each institution and provides a number of clarifications and links. The page is available from the DCC website. Retrieved 24 September from: <http://www.dcc.ac.uk/resource/curation-policies/>

1.3 JISC

Following a four month independent evaluation of phase 2 of the Digital Curation Centre, JISC was pleased to announce that it would fund the DCC to enter into a third phase of activity commencing in February 2010. This will enable the DCC to increase its focus on supporting effective data curation across the UK University sector. Bids for the 07/08 Data Management Infrastructure Call are currently being marked and funding will be allocated to 6-8 projects attracting up to £250k each over 18 months.

A broad range of other projects are being funded under the auspices of the 12/08 Information Environment (2009-2011) Call, and amongst the 45 or so projects that are now underway, four of them are classified as 'Preservation Exemplar' projects, designed to showcase tools, methods and services that will enable UK HEI's (and others) to effectively maintain meaningful access to valuable digital assets.

Other relevant JISC-funded projects include work in the e-journal archiving area. The PEPRS project is looking at the feasibility of an e-journals preservation registry and the PECAN project has just started to examine whether it is possible to formulate robust post-cancellation access arrangements for journal subscribers using private LOCKSS networks. JISC is also funding a follow-up study of the 'Keeping Research Data Safe' report that looks at the costs associated with the long-term storage of primary data and its reuse.

Work is nearing completion on the first iteration of a common framework to measure the impact of records management on organisations. This is part of JISC's ongoing commitment to support the more effective and efficient use of technology and this is manifest in another project in this area entitled 'Greening Information Management', an attempt to quantify the environmental impact of information management procedures and processes.

Another major area of work relates to web preservation. JISC is working with other partner organisations, notably the Digital Preservation Coalition and the members of the UK Web Archiving Consortium (UKWAC) to formulate the remit of the newly announced DPC Web Archiving and Preservation Task Force. It is anticipated that this new group will take on the agenda formerly owned by UKWAC but also add value by allowing all DPC member organisations to shape and scope the work that

the Task Force undertakes.

1.4 The British Library

LIFE³: Work began in August on the third phase of the UCL/British Library LIFE project (Life Cycle Information for E-Literature), jointly funded by JISC and RIN. By producing a predictive costing tool, LIFE³ will significantly improve the ability of organisations to plan and manage the preservation of digital content. The project will expand its existing Generic Preservation Model to create a comprehensive suite of models covering all life cycle stages, providing greater accuracy and assurance in estimation. The project team would be delighted to hear from organisations interested in assisting with trials of the tool. The team may be contacted via the LIFE website. Retrieved 24 September from: <http://www.life.ac.uk>.

The British Library Web Archiving Programme was represented at the BL/JISC/DPC Enduring Web conference on 21st July 2009. Helen Hockx-Yu, Web Archiving Programme Manager, gave an overview of web archiving tools, and Maureen Pennock, Web Archive Preservation Project Manager, spoke about the long term preservation of the UK Web Archive. Presentations, and full conference report (accessible to DPC members), are available at the DPC website. Retrieved 24 September from: <http://www.dpconline.org/graphics/events/090721MissingLinks.html>

1.5 PLANETS (Preservation and Long-term Access through Networked Services)

Planets conducted a series of briefings with suppliers and vendors who are engaged in, or who are interested in, digital preservation. The goals were to learn more about the needs of vendors and suppliers in the field of digital preservation to increase their understanding of Planets products and services. Another goal was to assess Planets' position in the digital preservation market beyond the term of the project. Planets has been analysing the findings and is using them to fine-tune its strategy planning for the last year of the project and beyond. A white paper summarising the findings will be published in the autumn.

Earlier this year, the Planets Community and e-bulletin service was launched, to help subscribers to the community stay informed about the progress of Planets and its contribution to the field of digital preservation. Since then, around 450 people from around the world have subscribed to the community. A recruitment campaign is planned, with the aim of encouraging more people involved in digital preservation projects in Europe to subscribe.

Planets is conducting research into which types of communication are important within academic and e-government communities, and the implication for preservation. This is being done in two phases:

1. qualitative analyses (from interviews and data probe collection);
2. quantitative analyses (questionnaires).

A report has been published which summarises the results of a questionnaire completed by researchers at Aarhus University in Denmark. The report may be viewed in full at the Planets website. Retrieved 24 September from: http://www.planets-project.eu/docs/reports/Planets_DT7-

[D4 Questionnaire Report.pdf](#)

A further report presenting results for government institutions in the Netherlands and Belgium is expected to be completed later this year. The guidelines describe the API and functionality of the Planets workflow execution engine (WEE) version 2. They provide an overview of the main components, the public interfaces, and describe how it is utilised through the Workflow Control Panel (WCP). The guidelines provide user documentation for configuring, deploying and accessing Planets workflow templates. Retrieved 24 September from: http://www.planets-project.eu/docs/reports/Planets_IF5-D1_Creating&Install_IF_Pres_Workflows.pdf

As Planets moves into its fourth and final year, work is underway to integrate Planets components into the operations of national libraries and archives within the Planets Consortium. These include The British Library, The Swiss Federal Archives, The National Library of The Netherlands, The National Library of Denmark, the National Archives of The Netherlands and Austrian National Library. More information is available in the seventh Planets newsletter, Planetarium Issue 7. Retrieved 24 September from: http://www.planets-project.eu/docs/newsletters/Planetarium7_July09.pdf

1.6 Library of Congress and the National Digital Information Infrastructure and Preservation Program (NDIIPP)

The Winter 2009 issue of "Library Trends" provides a broad overview of results from the Library of Congress National Digital Information Infrastructure and Preservation Program (*n.b. articles mentioned individually throughout this digest*). Retrieved 24 September 2009 from: http://www.digitalpreservation.gov/news/2009/20090604news_article_LT.html

Cruse, P & Sandore, B (2009) "Introduction: The Library of Congress National Digital Information Infrastructure and Preservation Program" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September from: http://muse.jhu.edu/journals/library_trends/toc/lib.57.3.html

The Library of Congress National Digital Information Infrastructure and Preservation Program launched a pilot program to test cloud technologies for preserving digital content. The pilot will focus on a new service, DuraCloud, developed and hosted by the DuraSpace Foundation. The test will cover both storage and access services, including content replication and monitoring services that span multiple cloud-storage providers. Retrieved 24 September 2009 from: http://www.digitalpreservation.gov/news/2009/20090723news_article_duracloud.html

The annual National Digital Information Infrastructure and Preservation Program meeting drew over 150 people from 20 states to share results from digital stewardship projects. Attendees also heard about developments regarding the Blue Ribbon Task Force on Sustainable Digital Preservation and Access; the Unified Digital Format Registry; and the Federal Digitization Standards Working Group.

Retrieved 24 September from:

http://www.digitalpreservation.gov/news/2009/20090702news_article_partnersmeeting.html

The Library of Congress National Digital Information Infrastructure and Preservation Program released a new video – the first in a planned series that will address digital-preservation issues – called, “Bagit: Transferring Content for Digital Preservation.” Retrieved 24 September from:

http://www.digitalpreservation.gov/news/2009/20090702news_article_videorelease.html

Following a successful pilot program during the spring of 2008, the Library of Congress, Internet Archive and California Digital Library initiated a web archiving program that explored archiving websites from the perspective of students in elementary, middle and high schools. Teens and younger students select and capture web content using Internet Archive’s Archive-It service, creating “time capsules” of what is important to them to represent their current lives. Retrieved 5 August 2009 from:

http://www.digitalpreservation.gov/news/2009/20090805news_article_k-12_archiving_program.html

1.7 The National Archives (UK)

Web continuity project: The National Archives is continuing to work with Central Government departments to ensure that web links on their sites work over time. Their innovative solution involves a combination of improved and regular web archiving, the installation of redirection software to keep links live, and a community of practice, where departments can find documentation and guidance, and share best practice. Since our last update, The National Archives, the Ministry of Justice, the Cabinet Office, HM Treasury and the department for Business, Innovations and Skills have installed the redirection component on their websites. The Web Continuity service will formally launch at an event in December 2009.

Digital continuity project: The National Archives is developing a flexible service for the public sector that will ensure it can use its digital information for as long as it needs to, over time and through change. This service is raising awareness and developing a common understanding of the issues, and providing a combination of guidance and technical tools and services, which departments can tailor to address their specific requirements. It is currently consulting on the outline requirements for a Framework of tools and services and briefing suppliers on its procurement approach. The project is working with Buying Solutions, the national procurement partner for UK public services, and aims to start procurement this autumn. The project is also consulting existing users about an upgraded DROID profiler tool, which provides information on what files a system contains. Some of its draft guidance is already available on the website too. Retrieved 24 September from: <http://www.nationalarchives.gov.uk/electronicrecords/digitalcontinuity/guidance-on-digital-continuity.htm>

1.8 nestor (Network of Expertise in Long-Term Storage of Digital Resources)

Six years of nestor state funding has come to an end and now nestor continues as a cooperation association between six organisations. It will continue close relationships with former cooperative organisations, and the legal expert team are still working on the legal aspects of digital preservation.

nestor has recently published a catalogue of persistent identifier systems in order to keep them preserved over time.

Buetikofer, N (2009) *Catalogue of criteria for assessing the trustworthiness of PI systems*. Draft for public comment. nestor-studies 13. nestor.

Retrieved 24 September from:

http://www.langzeitarchivierung.de/downloads/mat/nestor_mat_13_en.pdf

Presentation of the nestor Handbook , "nestor Handbook: A concise encyclopedia of long-term digital preservation" (in German) version 2.0 is now freely available via the nestor website. Hard copies are available to purchase. Retrieved 24 September from: <http://nestor.sub.uni-goettingen.de/handbuch/index.php>

The English-language version of nestor newsletter 17/2009 is available via the nestor site. Retrieved 24 September from: <http://nestor.sub.uni-goettingen.de/newsletter/index.php?lang=en>

1.9 Netherlands Coalition for Digital Preservation (NCDD)

The Netherlands Coalition for Digital Preservation (NCDD) has made available to the international digital preservation community an extensive twenty-page summary of the results of the National Digital Preservation Survey held in 2009. The interim report, entitled in English 'A future for our digital memory: permanent access to digital information in the Netherlands, is available at the Coalition's website.

Retrieved 24 September from: <http://www.ncdd.nl/en/activiteiten-natverkenning.php>.

Angevaare, I (ed) (2009) *A Future For Our Digital Memory; permanent access to information in the Netherlands. Interim Report – summary in English*. Retrieved 24 September from:

<http://www.ncdd.nl/en/documents/Englishsummary.pdf>

The survey as published in the reports was discussed at a conference on 18 September in the Hague. The results of the survey and the conference will be further discussed by the NCDD Board and form the basis of a strategy expected to be published by the end of 2009. The conference report (in Dutch) is available from the NCDD website:

<http://www.ncdd.nl/documents/NCDDcongres20090918verslag.pdf>

2. Specific themes

2.1 Definitions and directions

Research libraries are dependent on the development of digital preservation techniques. A paper by the Association of Research Libraries examines assumptions about current preservation practices and looks at preservation functions, the networked environment and possibilities of collaboration. A final set of recommendations is put forward as to how the digital preservation community can move ahead.

An article which gives an overview of European digital preservation developments, with specific focus on organisational aspects, is published in April's edition of *LIBER Quarterly*. The article looks at the nature of different digital preservation projects and how they fit together to provide a service. It also looks at actual digital objects themselves and how they themselves are changing over time.

Sierman, B (2009) "The Jigsaw Puzzle of Digital Preservation – an Overview". *LIBER Quarterly* 19 (1) April 2009. Retrieved 24 September from: <http://liber.library.uu.nl/publish/articles/000262/article.pdf>

Meyer, L (2009) "*Safeguarding Collections at the Dawn of the 21st Century: Describing Roles and Measuring Contemporary Preservation Activities in ARL Libraries*". Association of Research Libraries. Retrieved 24 September from: <http://www.arl.org/bm~doc/safeguarding-collections.pdf>

The UK Ministry of Justice recently announced in a press release that public information should be preserved for future generations. A new code of practice on managing digital records will be published, and this also alters the Freedom of Information Act. The press release is freely available via the Ministry's website. Retrieved 24 September from: <http://www.justice.gov.uk/news/newsrelease160709b.htm>

Digital Preservation Europe has released two in a series of short animations which explain digital preservation to a wider audience. 'Digital Preservation and Nuclear Disaster: An animation', and 'Team Digital Preservation and the Aeroplane Disaster' are short cartoons about the perils of losing digital information. The clips can be found on YouTube. Retrieved 24 September from: <http://www.youtube.com/watch?v=pbBa6Oam7-w> and <http://www.youtube.com/watch?v=EKnsZZzuUr4>

Ithaka has recently published a study looking at strategies being used to support digital initiatives over the long term. The report identified a number of international projects that would help illustrate business models and possible directions for sustainability. In turn these case studies help to understand the challenges and some solutions to long term digital preservation.

Maron, N et al. (2009) *Sustaining Digital Resources: An On-the-Ground View of Projects Today. Ithaka case studies in Sustainability*. Retrieved 24 September from: http://www.ithaka.org/ithaka-s-r/strategy/ithaka-case-studies-in-sustainability/report/SCA_Ithaka_SustainingDigitalResources_Report.pdf

2.2 Research data

Support for preservation and data management at institutional level is the subject of two recent articles.

Inge Angevaare's paper looks at responsibility for data curation within research libraries. It deals with the challenges in curating data, for example the disparate nature of research cultures, and the difficulties in populating institutional repositories hosted by libraries. It highlights the strong aspects of libraries and their position in the research community and provides a list of 'do's and don'ts' for research libraries that are tackling curation.

Beagrie et al. present more findings from the UK Research Data Service Feasibility study published earlier in 2009. The article looks closely at the findings from a survey of researchers' views on preservation practices for four UK universities, and it argues the case for a national shared service, which could be established in a number of different ways.

Angevaare, I (2009) "Taking Care of Digital Collections and Data: 'Curation' and Organisational Choices for Research Libraries" *LIBER Quarterly* 19 (1) April 2009. Retrieved 24 September from:
<http://liber.library.uu.nl/publish/articles/000278/article.pdf>

Beagrie, N., Beagrie, R., & Rowlands, I (2009) "Research Data Preservation and Access: the Views of Researchers" *Ariadne* 60 July 2009. Retrieved 24 September from: <http://www.ariadne.ac.uk/issue60/beagrie-et-al/>

The need for data management infrastructure is highlighted in a recent article that describes in detail a number of tools that have been created by the Australian ARCHER project, to ensure that data remains well created and publication-ready over time. The suite of tools is open source and based on the DART project.

Preservation of African library resources is the subject of a recent journal article. It looks at policy frameworks, training, funding, the need for regional collaboration, and the importance of strengthening the local publishing environment.

PARSE. Insight project has released a number of new publications, including a paper which gives an overview of the communities that have a stake in digital preservation, such as researchers; funders and publishers. The paper examines their role in the context of Europe. Further papers are available from the project website. Retrieved 24 September from: <http://www.parse-insight.eu/project.php>

The Data Preservation Alliance for the Social Sciences (Data-PASS) focuses on archiving social science research. Supported by NDIIPP, an article in *Library Trends* looks at the history of the project and how it has identified digital materials that have never been archived, as well as looking ahead to future projects that will produce data. Another paper in the *American Archivist* outlines how this collaborative venture approaches the preservation of such data. *N.b. these articles are available to journal subscribers only.* An article by Griffiths is based on the 2008 RIN report, *To share or not to share: Publication and quality assurance of research data outputs*, and looks at the report's main findings and reflects on motivations for publishing data and the types of data that should be preserved, as well as how data is re-used.

The application of the Trustworthy Repositories Audit and Certification Criteria and Checklist (TRAC) to a digital repository framework is the subject of a recent D-Lib article. DataStaR acts as a data staging repository to support data-sharing and to get data into digital repositories. By applying TRAC to the pilot stages of this repository development, it was possible to analyse the Checklist's effectiveness for

repository planning and management.

Androulakis, S et al. (2009) "ARCHER – e-Research Tools for Research Data Management". *International Journal of Digital Curation* vol. 4 No. 1 (2009) Retrieved 24 September from:
<http://www.ijdc.net/index.php/ijdc/article/view/99/74>

Altman, M et al. (2009) "Digital Preservation through Archival Collaboration: The Data Preservation Alliance for the Social Sciences" *American Archivist*. V. 72 No. 1 Spring/Summer 2009. Retrieved 24 September from:
<http://archivists.metapress.com/content/eu7252lhnrp7h188/fulltext.pdf>

Gutmann, M et al. (2009) "From Preserving the Past to Preserving the Future: the Data-PASS Project and the Challenges of Preserving Digital Social Science Data" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September from:
http://muse.jhu.edu/journals/library_trends/toc/lib.57.3.html

Griffiths, A (2009) "The Publication of Research Data: Researcher Attitudes and Behaviour." *International Journal of Digital Curation* vol. 4 No. 1 (2009). Retrieved 24 September from:
<http://www.ijdc.net/index.php/ijdc/article/view/101>

Kanyengo, C (2009) "Managing digital information resources in Africa: Preserving the integrity of scholarship". *The International Information and Library Review*. V.41, Issue 1, March 2009. Retrieved 24 September from:
<http://dx.doi.org/10.1016/j.iilr.2008.08.003>

MPG, KB (2009) *PARSE.Insight. INSIGHT issues into Permanent Access to the Records of Science in Europe*. Retrieved 24 September from:
http://www.parse-insight.eu/downloads/PARSE-Insight_D3-2_InventoryOfCommunities_final.pdf

Steinhart, G., Dietrich, D., & Green, A (2009) "Establishing Trust in a Chain of Preservation; the TRAC Checklist Applied to a Data Staging Repository (DataStaR)" *D-Lib Magazine* September/October 2009 v.15 no. 9/10. Retrieved 24 September from:
<http://www.dlib.org/dlib/september09/steinhart/09steinhart.html>

The JISC-funded Keeping Research Data Safe (KRDS) 2 project will extend previous work on digital preservation costs for research data, including the original KRDS1 study. The KRDS2 project, which started in April 2009, will identify and analyse sources of related cost data. The outcomes of the study will be critical in developing preservation-costing tools and associated cost-benefit analyses. These will be used to help justify and sustain major investments in repositories and data curation, not only for HEIs and their institutional repositories but also for other digital archives. The project is being led by Charles Beagrie Limited, with the UK Data Archive and OCLC Research providing managerial and research support. To date, the project has undertaken a detailed review of the activity model published in KRDS and made

a number of amendments to the model.

In addition a survey proforma has now been added to the project website to help identify other research data collections with information on preservation costs and issues. KRDS2 invite you to contribute to the data survey if you have research datasets and associated cost information that you feel may be of interest to the study. KRDS2 anticipate that no organisation will have complete information on costs but most will have cost information in some areas. The aim of the survey is to compile an overview of what preservation cost information is collected. More information is via the Charles Beagrie website. Retrieved 30 September from: <http://www.beagrie.com/jisc.php>

The Australian National Data Service (ANDS) has released a number of guides for researchers, has created an online discussion space and will be holding workshops on the sharing and management of research data in all Australian capital cities between September 2009 and May 2010. They have also released the first issue of their newsletter. Further information available from the ANDS website. Retrieved 1 October 2009 from: <http://ands.org.au/>

2.3 Web archiving

The TNA have launched a JISC-funded project, 'Delivering Coordinated UK Web Archives to User Communities' to inform and guide the whole of the UK's web archiving collections. Working with the UK Web Archiving Consortium (UKWAC), the study will look at current and future collaboration and future preservation options. More information is at the UKWAC website. Retrieved 24 September from: <http://www.webarchive.org.uk/ukwa/>. Further information about the study is also available via a paper given by Cathy Smith at the JISC, DPC and UKWAC Missing Links Conference.

Smith, C (2009) "Content and Context - Delivering Coordinated UK Web Archives to User Communities" Power Point Presentation at *Missing Links* conference, British Library, London, 21 July 2009.
<http://www.dpconline.org/docs/events/090721MissingLinksSmith.pdf>

A number of new web archiving tools have been created. The Web-at-Risk project is funded by NDIIPP and is a collaborative venture between a number of US institutions. A main outcome is the Web Archiving Service, a curatorial tool, which is outlined in a Library Trends paper, which also looks at future directions for the project. Another NDIIPP project, in association with OCLC, has created the Web Archives Workbench (WAW), an open-source suite of web archiving tools to ingest files into a repository, based on the 'Arizona Model'. It is based on the idea of archiving items in groups rather than individually. *N.b. these articles are available to journal subscribers only.*

A paper by Spencer et al. looks at the UK Government's experience of preserving web information and the challenges that are presented, such as missing links in Hansard. The article also touches on the department's involvement with The National Archives' Web Continuity Project.

Hswe, P et al. (2009) "The Web Archives Workbench (WAW) Tool Suite: Taking an Archival Approach to the Preservation of Web Content" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September from: http://muse.jhu.edu/journals/library_trends/summary/v057/57.3.hswe.html

Seneca, T (2009) "The Web-at-Risk at Three: Overview of an NDIIPP Web Archiving Initiative" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September from: http://muse.jhu.edu/journals/library_trends/summary/v057/57.3.seneca.html

Spencer, A et al. (2009) "UK Government Web Continuity: Persistent Access through Aligning Infrastructures". *International Journal of Digital Curation* vol. 4 No. 1 (2009) Retrieved 24 September from: <http://www.ijdc.net/index.php/ijdc/article/view/106/81>

Harvard University Library has launched its new Web Archive Collection Service (WAX). The project investigated different technologies for web archiving, as well as metadata. It was developed using open source tools and is now part of the Library's infrastructure. The archive is freely available online. Retrieved 24 September from: <http://wax.lib.harvard.edu/collections/home.do>

The opening of The National Library of Finland's web archive in April 2009 which is available to researchers within the Library is described in an article in the Bulletin.

Jannsson, L. (2009) "Finland's Internet Archive". National Library of Finland Bulletin 2009. Retrieved 1 October 2009 from: <http://www.kansalliskirjasto.fi/extra/bulletin/article4.html>

The National and University Library of Iceland launched public access to the Icelandic Web Archive (Vefsafn.is) in September. The archive is freely available online via a wayback machine like the one used by the Internet Archive . Retrieved 1 October 2009 from: <http://vefsafn.is/index.php?page=english>

2.4 Digital preservation life cycle

An article in the International Journal of Digital Curation looks at the concept of the lifecycle within digital curation. It examines two different models and proposes merging the models in order to provide a more complete model and to provide a stimulus for further discussion. Personal digital archives is the subject of an article in Aslib. Personal information management is an under-researched field, and this article, which carried out an extensive literature analysis and survey, highlights the diverse ways in which individuals archive their data. This area is a challenging field, one that that this paper will contribute to. *N.b. this article is available to journal subscribers only.*

Constantopoulos, P et al. (2009) "DCC&U: An Extended Digital Curation Lifecycle Model" *International Journal of Digital Curation* vol. 4 No. 1 (2009) Retrieved 24 September from: <http://www.ijdc.net/index.php/ijdc/article/view/100>

Williams, P., John, J., & Rowland, I (2009) "The personal curation of digital objects: A lifecycle approach" *Aslib Proceedings*. V. 61, Issue 4. Retrieved 24

September from:

<http://www.emeraldinsight.com/10.1108/00012530910973767>

Cataloguing is the subject of a recent article which looks at the challenges of digital preservation and obtaining further bibliographic information outside of the catalogue. *N.b. this article is available to journal subscribers only.*

Abrahamse, B (2009) "Cataloguing Matters for Digital Preservation" *The Serials Librarian*. V. 57, Issue 1/2 July 2009. Retrieved 24 September from: <http://www.informaworld.com/smpp/content~db=jour~content=a913059623>

An article from the PLANETS project looks at the importance of significant characteristics in preservation planning. The paper provides useful definitions of the terms 'properties', 'characteristics' and 'representation information', and seeks to provide a conceptual model within a digital preservation framework.

Dappert, A & Farquhar, A (2009) *Significance is in the Eye of the Stakeholder*. The British Library. Retrieved 24 September from: http://www.planets-project.eu/docs/papers/Dappert_Significant_Characteristics_ECDL2009.pdf

The Digital Continuity Action Plan is aimed at keeping New Zealand public records in perpetuity. Many public institutions are involved and Archives New Zealand will lead on this uniquely unified public sector approach to preserve public sector information. More information is at the Archives New Zealand website. Retrieved 24 September from: <http://continuum.archives.govt.nz/digital-continuity-action-plan.html>

2.5 e-Journals

The KB e-Depot is the subject of a LIBER Quarterly article. It outlines the history of the e-Depot, and highlights where the operation sits within the organization; some functions have a parallel workflow with traditional materials. The author touches on the overall responsibility for e-journal preservation, and how national libraries could take on the role of such safeguarding. The article concludes with the importance of a collaborative perspective on digital preservation and the 'Safe Places Network'.

e-Journals and license agreements within a university setting are explored in a *Serials Librarian* article. The King Fahd University of Petroleum and Minerals in Saudi Arabia are exploring how to provide perpetual access to their e-holdings and the article explains the results of a survey looking at publishers' attitudes to permanent access. *N.b. this article is available to journal subscribers only.*

Portico's model is the subject of another article which highlights the importance of responsiveness to community needs to run a successful e-journal archiving programme. *N.b. this article is available to journal subscribers only.*

Ras, M (2009) "The KB e-Depot: Building and Managing a Safe Place for e-Journals" *LIBER Quarterly* 19 (1) April 2009. Retrieved 24 September from: <http://liber.library.uu.nl/publish/articles/000276/article.pdf>

Khurshid, Z., & Shaikh, J (2009) "Current Initiatives for E-Journal Archives and Perpetual Access at King Fahd University of Petroleum & Minerals" *The*

Serials Librarian. V. 57, Issue 1/2 July 2009. Retrieved 24 September from: <http://www.informaworld.com/smpp/content~db=jour~content=a913060041>

Kirchhoff, A (2009) "Expanding the Preservation Network: Lessons from Portico" *Library Trends* v.57 No.3 Winter 2009.
http://muse.jhu.edu/journals/library_trends/v057/57.3.kirchhoff.html

2.6 Tools and standards

File Information Tool Set (FITS) developed by Harvard University Library, acts as a wrapper for other tools that extract metadata for file formats. This is to enable support for a wide range of file formats. Output is converted to a single file, common format, FITS-XML. Downloads of the tool are available at the FITS website. Retrieved 24 September from: <http://code.google.com/p/fits/>

A new research repository tool, Zentity, has been developed by Microsoft. It enables researchers to preserve their academic assets, and the semantic relationships between the assets, more efficiently. The tool also supports services such as OAI-ORE and SWORD. Free downloads are available from the Microsoft site. Retrieved 24 September from: <http://www.microsoft.com/scholarlycomm>

A prototype of JHOVE2 is now available. The new planned architecture for the tool is reflected in this release. Feedback on this file format characterisation tool is welcomed. Retrieved 24 September from: <http://confluence.ucop.edu/display/JHOVE2Info/Home>

The International Internet Preservation Consortium (IIPC) has released the WARC file format, an ISO standard. A tool that gathers together all the constituent files in the web archiving process will be welcomed as it makes storage and exchange easier. Based on the ARC format, WARC can store all types of digital files. More information and downloads are available from the netpreserve website. Retrieved 24 September from: <http://netpreserve.org/press/pr20090601.php>

A range of different tools for digital preservation is described in a *Library Trends* article which also highlights how digital preservation pervades such a wide range of human activities, from government, to business, to personal data. *N.b. this article is available to journal subscribers only.*

JaJa, J & Song, S (2009) "Robust Tools and Services for Long-Term Preservation of Digital Information" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September from: http://muse.jhu.edu/journals/library_trends/v057/57.3.jaja.html

Dubin et al. describe an NDIIPP-funded project, the ECHO DEpository project, which is creating tools to support digital preservation activities, such as web archiving and repository interoperability. In addition the project will look at the semantics of preservation and the relationships between objects, which can help prevent preservation risks.

Dubin, D et al. (2009) "Preserving Meaning, Not Just Objects: Semantics and Digital Preservation" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September from:
http://muse.jhu.edu/journals/library_trends/v057/57.3.dubin.html

2.7 Institutional repositories

The Centre for Research Libraries (CRL) will undertake an in depth assessment of Portico and HathiTrust repositories. Findings will be published at a workshop in November 2009. More information about the project is available from the CRL website. Retrieved 24 September from:
<http://www.crl.edu/content.asp?l1=13&l2=58&l3=181>

A project which analysed digital repository software is outlined in D-Lib. The US National Institutes of Health National Library of Medicine evaluated a set of functional requirements based on OAIS, in order to recommend a repository system.

A decision-making and planning tool has been published by the Data Information Specialists Committee – UK (DISC-UK). The guide includes data related topics such as data sharing and metadata. A whole section on preservation of data is included, and includes topics such as retention period, fixity and file preservation. The report is freely available from the DISC website.

The REMAP project was a follow on project to the RepoMMan project whereby records management and digital preservation components were added into a digital repository system. The project is described in detail in April's edition of Ariadne.

Following on from the previous PEER project publication by Bretel, F et al., (see <http://www.dpconline.org/graphics/whatsnew/issue20.html#instrep>). Bijsterbosch et al., have written more guidelines for both author and publisher deposit. The report's concise style enables quick reference and an overview of publisher participation in the PEER communities, as well as the technical issues involved in data transfer between publishers and repositories, and authors and repositories.

An article in Library Trends explains the MetaArchive Cooperative which enables institutions to host their own digital preservation solutions instead of outsourcing. Based on LOCKSS, the programme fosters organizational structures to carry out collaborative work between peer institutions.

Private LOCKSS Networks are focused preservation networks for specialized subject areas. Reich and Rosenthal explain this approach in a Library Trends article, and how the use of LOCKSS can enable special interest groups to share collections.

Bijsterbosch, M et al. (2009) "*D3.1 Guidelines for publishers and repository managers on deposit, assisted deposit and self-archiving.*" Publishing and the Ecology of European Research. Retrieved 7 October from:
http://www.peerproject.eu/fileadmin/media/reports/D3_1_Guidelines_v8.3_20090528.Final.pdf

Green, R & Awre, C (2009) "The REMAP Project: Steps towards a Repository-enabled Information Environment" *Ariadne* 59 April 2009. Retrieved 24

September 2009: <http://www.ariadne.ac.uk/issue59/green-awre/>

Green, A., Macdonald, S., Rice, R (2009) *Policy making for Research Data in Repositories: A Guide*. DISC-UK. Retrieved 24 September 2009: <http://www.disc-uk.org/docs/guide.pdf>

Marill, J & Luczak, E (2009) "Evaluation of Digital Repository Software at the National Library of Medicine" *D-Lib* v.15 No. 5/6 May/June 2009. Retrieved 24 September from: <http://www.dlib.org/dlib/may09/marill/05marill.html>

Reich, V & Rosenthal, D (2009) "Distributed Digital Preservation: Private LOCKSS Networks as Business, Social and Technical Frameworks" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September 2009: http://muse.jhu.edu/journals/library_trends/summary/v057/57.3.reich.html

Skinner, K & Halbert, M (2009) "The MetaArchive Cooperation: A Collaborative Approach to Distributed Digital Preservation". *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September 2009: http://muse.jhu.edu/journals/library_trends/summary/v057/57.3.skinner.html

RODA is an open source archival digital repository with a centralized architecture and self-deposit ingest, created by the Portuguese National Archives and the University of Minho. It is based on standards such as OAIS and PREMIS, and addresses long-term preservation. A demo of the software is now available. Retrieved 24 September 2009: <http://roda.di.uminho.pt/?locale=en#home>

2.8 File formats

The Collaborative Electronic Records Project (CERP) has developed the Email Parser which migrates email accounts into a single XML file. Downloads for this open source software can be found at the project website. Retrieved 24 September 2009: <http://siarchives.si.edu/cerp/parserdownload.htm>

Public television files are at risk of being lost as most are now created in digital form. A project in the US, funded by NDIIPP, and described in a paper by Rubin, is building a model repository for such files and is advocating creating metadata standards across the field. Raising awareness of the risk was another goal of the project.

3-D digital objects have been somewhat overlooked in digital preservation research. A recent article by Doyle et al. looks at the history of the preservation of complex 3-D files, for example, human body scans, and establishes a preservation architecture, an emulation and a metadata framework and looks in detail at how to preserve the preservation environment and the object's authenticity. Another article by MacKenzie Smith looks at 3-D CAD models and a project, FACADE, that is investigating the challenges, such as metadata, in 3-D file preservation. Two tools

have been developed to assist in the curation of CAD engineering models. A further article by Patel et al., looks at these tools and the complexities of curating this format.

Doyle, J., Viktor, H., & Paquet, E (2009) "Long-term digital preservation: preserving authenticity and usability of 3-D data" *International Journal on Digital Libraries* v.10, no.1 May 2009. Retrieved 24 September 2009: <http://www.springerlink.com/content/r624114872486937/fulltext.pdf>

Patel, M., Ball, A., & Ding, L (2009) "Strategies for the Curation of CAD Engineering Models" *International Journal of Digital Curation* vol. 4 No. 1 (2009). Retrieved 24 September 2009: <http://www.ijdc.net/index.php/ijdc/article/view/104>

Rubin, N (2009) "Preserving Digital Public Television: Not Just an Archive, but a New Attitude to Preserve Public Broadcasting" *Library Trends* v.57 No.3 Winter 2009. Retrieved 24 September 2009: http://muse.jhu.edu/journals/library_trends/summary/v057/57.3.rubin.html

Smith, M (2009) "Curating Architectural 3D CAD Models" *International Journal of Digital Curation* vol. 4 No. 1 (2009). <http://www.ijdc.net/index.php/ijdc/article/view/105>

The Wellcome Library has taken a decision to use the JPEG2000 image format to store its content, following the publication of a specially commissioned report by Robert Buckley about the format. The report puts forward a number of recommendations and is freely available at the Scribd website.

As part of a records management guide by Digital Preservation Europe, a section on digital preservation of photos is included among a range of records management topics. Personal and organisational photos are touched on in relation to storage, technology changes, access and disposition.

Buckley, R (2009) *JPEG2000 as a preservation and Access Format for the Wellcome Trust Digital Library*. Edited by Simon Tanner. Retrieved 24 September 2009: <http://www.scribd.com/doc/19885793/JPEG2000-Recommendations-for-the-Wellcome-Trust>

Digital Preservation Europe (2009) *Managing Your Photographs: The Basics*. Retrieved 24 September 2009: http://www.digitalpreservationeurope.eu/publications/reports/D2_4_Tailored_version_of_the_records_management_module.pdf

3. Events

3.1 Recent events

2009

May

Archiving 2009. 4-7 May 2009. Arlington Virginia, USA.

Abstracts freely available and proceedings for purchase from Society for Imaging Science and Technology. Retrieved 1 October 2009 from:
<http://www.imaging.org/ScriptContent/store/phypub.cfm?seriesid=28&pubid=910>

African Digital Scholarship and Curation 2009. 12-14 May 2009. Pretoria, South Africa.

Papers and presentations available from the conference website. Retrieved 6 October 2009 from: <http://www.library.up.ac.za/digi/programme.htm>

OR 2009: The 4th International Conference on Open Repositories. 18-21 May 2009. Atlanta, Georgia, USA.

Presentations available from the SMARTech at Georgia Tech website. Retrieved 1 October 2009 from:
http://smartech.gatech.edu/dspace/handle/1853/28073/browse?type=title&submit_browse=Title

LIDA 2009: Libraries in the Digital Age. 25-30 May 2009. Dubrovnik and Zadar, Croatia.

Presentations available from the conference website. Retrieved 1 October 2009 from: <http://www.ffos.hr/lida/program/>

June

ETD 2009: 12th International Symposium on Electronic Theses and Dissertations: Bridging the Knowledge Divide. 10-13 June 2009. Pittsburgh University, Pittsburgh Pennsylvania, USA.

Papers available from the conference website. Retrieved 1 October 2009 from :
<http://www.library.pitt.edu/etd2009/>

ELPUB 2009: 13th International Conference on Electronic Publishing: Rethinking Electronic Publishing: Innovation in Communication Paradigms and Technologies. 10-12 June 2009. Milan, Italy.

Presentations and papers available from the conference website. Retrieved 1 October 2009 from: <http://conferences.aepic.it/elpub2009/>

CERN Workshop on Innovations in Scholarly Communication (OA16). 17-19 June 2009. University of Geneva, Switzerland.

Presentations available from the conference website. Retrieved 1 October 2009 from: <http://indico.cern.ch/conferenceTimeTable.py?confId=48321>

Institutional Web Management Workshop 2009. 19 June 2009. University of Essex, UK.

Presentations available from Slideshare. Retrieved 24 September 2009: <http://www.slideshare.net/event/iwmw2009/slideshows>

InDP 2009: First International Workshop on innovation in Digital Preservation. 19 June 2009, Austin, Texas USA.

Workshop proceedings available from conference website. Retrieved 24 September 2009: <http://cs.harding.edu/indp/schedule.html>

Digital Preservation - The Planets Way. 22-24 June 2009. Royal Library, Copenhagen, Denmark.

Presentations available from the Planets Website. Retrieved 1 October 2009 from: <http://www.planets-project.eu/events/copenhagen-2009/programme/>

38th LIBER Annual General Conference 2009: Innovation Through Collaboration. 30 June - 3 July 2009. Toulouse University, Toulouse, France.

Presentations available from the conference website. Retrieved 1 October 2009: <http://liber2009.biu-toulouse.fr/presentations>

July

Missing Links: The Enduring Web. 21 July 2009, British Library, London, UK.

Presentations available from DPC website. Retrieved 24 September 2009: <http://www.dpconline.org/graphics/events/090721MissingLinks.html>

August

World Library and Information Congress: 75th IFLA General Conference and Council. Libraries Create Futures: Building on Cultural Heritage. 23-27 August 2009. Milan, Italy.

Proceedings available from the IFLA website. Retrieved 1 October 2009 from: <http://www.ifla.org/annual-conference/ifla75/programme2009-en.php>

September

Digital Preservation - The Planets Way: Second Planets Outreach and Training Event. 16 September 2009. Sofia, Bulgaria.

Presentations available from Planets website. Retrieved 1 October 2009:
<http://www.planets-project.eu/events/sofia-2009/programme/>

NCDD 2009 Werkconferentie 'Toekomst voor ons digitaal geheugen'. 18 September 2009. Koninklijke Bibliotheek, The Hague, Netherlands.

Workshop report (in Dutch) and presentations available from the NCDD website. Retrieved 1 October 2009 from: <http://www.ncdd.nl/activiteiten-evenementen.php>

3.2 Current and Forthcoming events

2009

September

ECDL 2009: 13th European Conference on Digital Libraries: Digital Societies. 27 September - 2 October 2009. Corfu, Greece. Retrieved 1 October 2009 from: <http://www.ecdl2009.eu/>

IWAW 2009: 9th International Web Archiving Workshop. 30 September - 1 October 2009. Corfu, Greece. Retrieved 1 October 2009 from: <http://iwaw.net/09/>

October

Second Workshop on Very Large Digital Libraries. 2 October 2009. Corfu, Greece. Retrieved 1 October 2009 from: <http://www.delos.info/vldl2009>

PrestoPRIME Dissemination Event. 5-6 October 2009. ORF Centre, Vienna, Austria. Retrieved 1 October 2009 from: <http://www.prestoprime.org/>

iPres 2009. The Sixth International Conference on Preservation of Digital Objects. 5-6 October 2009. California Digital Library, San Francisco, US. Retrieved 24 September from: <http://www.cdlib.org/iPres/ipres2009.html>

PREMIS Implementation Fair 2009. October 7 2009. Presidio's Officers' Club, San Francisco, USA. <http://www.loc.gov/standards/premis/premis-implementation-fair2009.html>

IIPC Open Day: Active Solutions for Preserving Internet Content. 7 October

2009. Mission Bay Conference Center, San Francisco, California, USA.
Retrieved 1 October 2009 from:
<http://netpreserve.org/events/ActiveSolutions.php>

JHOVE2 2009 Fall Workshop. 7 October 2009. Mission Bay Conference Center, San Francisco, California, USA. Retrieved 1 October 2009 from:
<http://jhove2.eventbrite.com/>

OSS Watch Workshop: Engaging Developers with Open Source Projects. 9 October. Oxford University Computing Services, Oxford, UK. Retrieved 24 September from: <http://www.oss-watch.ac.uk/events/2009-10-09/programme.xml>

2nd LIBER-EBLIDA Workshop on Digitisation of Library Material in Europe. 19-21 October 2009. Koninklijke Bibliotheek, Netherlands. Retrieved 1 October 2009 from: <http://www.libereurope.eu/node/391>

Digital Preservation Road Show. 28 October 2009. Old College, University of Edinburgh. Retrieved 24 September 2009:
<http://www.archives.org.uk/events.asp?id=246>

Kuopio-3: The Universal Repository Library and Guarantees for the Sustainability of the Digital Copy. 29-30 October 2009. Kuopio, Finland. Retrieved 1 October 2009 from: <http://www.ifla.org/en/events/the-universal-repository-library-and-guarantees-for-the-sustainability-of-the-digital-copy>

November

Fourth International Conference on Digital Information Management (ICDIM 2009), 1-4 November 2009. Ann Arbor, Michigan, US. Retrieved 24 September from: <http://www.icdim.org/>

INFuture2009: *"Digital Resources and Knowledge Sharing"* 4-6 November 2009, Zagreb, Croatia Retrieved 24 September from:
<http://infoz.ffzg.hr/INFuture/>

EVA/MINERVA Jerusalem 2009 Conference on Digitisation of Cultural Heritage. 10-11 November 2009. Van Leer Jerusalem Institute, Jerusalem, Israel. Retrieved 1 October 2009 from:
<http://www.minervaisrael.org.il/evaminerva2009.html>

2009 Conference and Members' Meeting of the TEI Consortium: Text Encoding in the Era of Mass Digitization. 11-15 November 2009. University of Michigan, Ann Arbor, Michigan USA. Retrieved 1 October 2009 from:
<http://www.lib.umich.edu/spo/teimeeting09/>

2009 National Digital Forum Conference: Being Online Now: Culture Creativity and Community. 23-24 November 2009. Museum of New Zealand Te Papa Tongarewa, Wellington, NZ. Retrieved 1 October 2009 from: <http://ndf.natlib.govt.nz/about/2009-conference.htm>

Re:live09 : Third International Conference on the Histories of Media Art, Science and Technology. 26-29 November 2009. Melbourne, Australia. Retrieved 1 October 2009 from: <http://www.mediaarthistory.org/>

Alliance for Permanent Access Conference 2009. 24 November 2009. KB, The Netherlands. Retrieved 24 September 2009: <http://www.alliancepermanentaccess.eu/>

December

International Conference of Digital Archives and Digital Humanities. 1-2 December 2009. National Taiwan University, Taipei, Taiwan. Retrieved 1 October 2009 from: <http://www.digital.ntu.edu.tw/DADH/indexEN.php>

PV 2009 Conference. Ensuring Long-Term Preservation and Adding Value to Scientific and Technical Data. 1-3 December 2009. European Space Astronomy Centre, Spain. Retrieved 24 September from: <http://www.sciops.esa.int/index.php?project=CONFERENCE&page=PV2009>

5th International Digital Curation Conference "*Moving to Multi-Scale Science: Managing Complexity and Diversity*" 2-4 December 2009. London, UK. Retrieved 24 September from: <http://www.dcc.ac.uk/events/dcc-2009/call-for-papers/>

DISH 2009: Digital Strategies for Heritage. 8-10 Dec 2009. de Doelen in Rotterdam, Netherlands. Retrieved 1 October 2009 from: <http://www.dish2009.nl/>

GL11: Eleventh International Conference on Grey Literature: The Grey Mosaic Piecing It All Together. 14-15 December 2009. Library of Congress, Washington DC, USA. Retrieved 1 October 2009 from: <http://www.textrelease.com/gl11conference.html>

Cultural Heritage Online: Empowering Users: An Active Role for User Communities. 15-16 December 2009. Florence, Italy. Retrieved 1 October 2009 from: <http://www.rinascimento-digitale.it/conference2009.phtml>

2010

April

ECA 2010. 8th European Conference on Digital Archiving, 28-30 April 2010. Geneva, Switzerland. Retrieved 24 September from: <http://www.bar.admin.ch/eca2010/index.html?lang=en>

May

JTS 2010. Digital Challenges and Digital Opportunities in Audiovisual Archiving May 2-5 2010, Oslo, Norway. Retrieved 24 September 2009: <http://www.jts2010.org/>

June

Archiving 2010 Workshop on Archiving in Digital Cartography and Geoinformation. 10-12 June 2010. Berlin Germany. Retrieved 1 October 2009 from: http://www.codata-germany.org/Archiving_2010/

3.3 Training Events

October

Workshop on Digital Preservation Management: Short-term Solutions for Long-Term Problems. 11-16 October 2009, Ann Arbor, Michigan, US. Retrieved 24 September from: <http://www.icpsr.umich.edu/dpm/workshops/fiveday.html>

Digital Preservation Training Programme. 19-21 October 2009. London, UK. Retrieved 24 September 2009: <http://www.dptp.org/2009/07/course-oct09/>

November

Media Art Histories module. November 2-12 2009. Berlin & Krems, Germany. Retrieved 24 September from: <http://www.donau-uni.ac.at/en/studium/medienkunstbasic/index.php>

Digital Preservation – The Planets Way. 17-19 November 2009. Swiss Federal Archives, Bern, Switzerland. Retrieved 24 September 2009: <http://www.planets-project.eu/events/bern-2009/>

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