DigiCULT.Info

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DigiCULT Forum, Essen. Photography by John Pereira, © Salzburg Research

Welcome to the second DigiCULT.Info. In this issue we have added reviews of conferences and workshops; the 2002 Digital Resources in the Humanities Conference and the Pistoia Meeting on Creativity in Technology R&D are among the first of these. We have added a new section on Challenges/Strategic Issues/New Initiatives beginning with an interview with Jon Ippolito of Guggenheim's Variable Media Initiative and an examination by Gregory Crane of the specific needs of cultural heritage digital libraries. Finally, a review by Hans Hofman of the Preservation Metadata and the OAIS Model is the first of a series of forthcoming investigations of key technological topics. We welcome suggestions for further development to make DigiCULT.Info better serve the cultural and scientific heritage sector.

DigiCULT Results & News

Information Sections

Challenges / Strategic Issues / New Initiatives

Reports on Culture & Technology Events

For subscription to the DigiCULT.Info please go to: http://www.digicult.info

DigiCULT Results & News

DigiCULT Thematic Issue Number 1 is Now Available Online

DigiCULT Thematic Issue Number 1 is now available for download from the DigiCULT website. As a synopsis of the DigiCULT Barcelona Forum on 'Integrity and Authenticity of Digital Cultural Heritage Objects', held in Essen on May 6th 2002, it summarises and provides insight into the current thinking on the inherent risks new technologies pose to the preservation of our cultural and scientific heritage (jump to the PDF version).

Events Database for the Culture & Technologies Community Launched

In an effort to improve access to information about events of interest to the cultural and technology community DigiCULT has launched an Online Events Information Service. We invite organisers to make their events known on the DigiCULT website. All submissions will be filtered to maintain a high level of applicability. The announcements will also be included in the newsletter. (submit an event).

Second DigiCULT Forum: DAMS for the Cultural Heritage Sector

DigiCULT Forum, Essen. © Salzburg Research

With participating experts covering the complete spectrum from systems creators and integrators to end users of digital asset management systems, DigiCULT was provided with a unique look into the current commercial models and approaches to unlocking the value of digital assets and its transfer potential for the cultural heritage sector.

Moderator Michael Moon, scholarly in half-moon glasses, opened the debate with a key presentation defining the scope of the discussions (see list of participants).

Thematic Issue 2 will be available in December 2002.

Distribution of Printed Thematic Issues

The print version of the Thematic Issue will be available at selected events, please visit the DigiCULT website for regular updates.

If you are organising an event and wish to distribute this Thematic Issue to your audience, please provide a short e-mail with details. The Thematic Issues will be provided free of charge in minimum amounts of 65 per box, but please note that due to limited numbers we will prioritise the events based on relevance and most likely to benefit from the material (become a DigiCULT ambassador).

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DAMS Capture the Imagination

Michael Moon
© Salzburg Research

Interview with Michael Moon, Gistics Inc.

By Joost van Kasteren

Through some sort of creative process, knowledge workers generate ideas and concepts which precipitate in texts, photos, drawings, graphic designs, assets that today are digital by nature or can be digitised. 'By properly managing these assets you can greatly increase the productivity of knowledge workers', says Michael Moon, president of Gistics Inc. Gistics is a California-based company that researches return on investment for the adoption of new technologies. Every year they publish a market report on digital asset management. According to their latest estimates (2002) the market for digital asset management amounts to $60 billion per year by 2005.

Digital assets differ from 'content' in that they have an economic value. Because they can be re-used and re-expressed over a longer time period their development costs can be capitalised and put on the balance sheet. Furthermore, there is the huge burst in productivity that digital asset management can bring to companies and organisations. According to Moon, digital asset management increases productivity in two ways: 'First, retrieval of files that one can reuse 'as is'or re-express, that is, add new value or creativity, can stimulate the creative process. Asset repositories make it easier for knowledge workers to build and share a library of reusable components. Second, convenient access to these assets reduces the wasted time otherwise spent searching, analysing search results, and verifying possession of the most current version.'

Creative workers do not function in a command-and-control environment, acknowledges Moon. You have to sort of seduce them to make them more productive by using a DAMS. One way to do this is to make the value they bring to the company more transparent. Moon says: 'At the moment, the value they create often goes unnoticed. A DAMS can help in making it visible. That can have financial implications for them but it also gives possibilities for 'branding' their own style. That, in turn, can help in getting better 'gigs'. For the company the value of digital assets can be correlated to business results. It creates a system of accountability where earlier the contributions from creative departments were much harder to measure. Apart from increasing the effectiveness of your marketing efforts and the productivity of your knowledge workers, a DAMS also gives you an unmatched level of insight into your business processes.'

Another important incentive for knowledge workers is to be part of a trusted network of colleagues and to feel needed as a source of expertise. Referring to the book *The Social Life of Information* by John Sealy Brown and Paul Duguid, Moon points to the fact that networks of practitioners often form the principal repository of essential knowledge. Moon: 'This tacit knowledge, which is circulating among knowledge workers, is very difficult to capture. You can only access it by asking the right questions. Most of the time these are 'what'-questions. Not 'how'-questions: these are answered in the hand-

books. Neither are they "why"-questions because these refer to motives and rationalisations. It is mostly "what"-questions, because they help people in establishing category and context. Good, well-formed questions give you access to this wealth of knowledge. That is what knowledge management is all about. Hence a digital asset management system includes a database of well-formed questions and associates them to digital files that may contain those answers sought by others.'

Capturing tacit knowledge in a DAMS is important because it puts the outcome in the right perspective and that helps in telling the good stories, Moon says. Storytelling? 'Indeed', he continues, 'knowledge is not transferred by reciting data, but by telling stories. A well-told story is an important vehicle to get knowledge across, as every teacher can tell you. Not only in classrooms but also in companies. A good executive knows both how to listen and how to tell stories. To his staff, to his investors, to his customers.'

The effectiveness of transferring knowledge by storytelling is greatly enhanced by images. That a picture says more than a thousand words is common wisdom among editors of newspapers and magazines. The same goes for graphics. Moon: 'Images can convey context, scope, causality and hierarchy. They visualise ideas and concepts in a straightforward way. It is not for nothing that thousands of executives, researchers, teachers and other people who want to convey knowledge use MS PowerPoint. Although it is a foul program to work with, it can communicate information more quickly and by that can increase productivity.'

The next big leap will be images with hyperlinks, hot spots on the image which guide you through a wealth of information. Moon: 'You can compare it with the layered drawings of the human body you find in textbooks', he says. 'The first layer is the skin, the next is the muscles, then the blood vessels, the lymph system and so on. In a DAMS you can hyperlink the image to all kinds of information and make renderings for different kinds of users. From school children to medical doctors and from lay people to researchers. It really becomes a body of information. The picture itself becomes a visual navigation tool.'

Therefore, Moon envisages that, by combining DAMS and new visualisation approaches, cultural heritage organisations will be enabled to provide the wealth of their collections and related knowledge in fascinating new ways to their different users, be they school children or researchers.

Information Sections

30th Anniversary of UNESCO's World Heritage Convention

Throughout October and November, UNESCO's World Heritage Convention (see http://whc.unesco.org) will celebrate its 30th anniversary with events related to Technology and New Media for Documentation, Preservation, Management, Sustainable Tourism and Education. The UNESCO World Heritage Centre, in partnership with cultural and scientific societies and institutions, universities and governments worldwide, is organising a VIRTUAL CONGRESS with series of themed Conferences focusing on issues of World Heritage in the Digital Age. The six themed conferences take place in:

- Alexandria, EGYPT: Heritage Management Mapping: GIS & Multimedia
- Beijing, CHINA: Architecture, World Heritage, & Tourism
- Dakar, SENEGAL: Teaching World Heritage in Africa
- Mexico City, MEXICO: Management of Heritage Cities: Planning for Mixed Use & Social Equity
- Paris, FRANCE: Elected Representatives & World Heritage: Challenges of Decentralisation
- Strasbourg, FRANCE: Space Applications for Heritage Conservation

Tying the physical gatherings together, the encompassing VIRTUAL CONGRESS will link these eight events through the Internet and new media and via a printed colour Joint Proceedings with accompanying DVD of the best research and media projects of WORLD HERITAGE IN THE DIGITAL AGE.
http://www.virtualworldheritage.org

Metadata Update

The Dublin Core community continues to grow: by September 2002, all DCMI public mailing lists had over 2,900 subscriptions, which is an increase of more than 600 since last year.

Details of the Dublin Core Conference (DC-2002), which will be held in Florence, Italy, 13-17 October 2002, can be found at http://www.bncf.net/dc2002. The event will consist of a set of tutorials, conference sessions with reviewed papers, working group meetings and special topic workshops.

After the publication of version 1.1 of the Dublin Core Metadata Element Set as CEN Workshop Agreement (http://www.cenorm.be/isss/cwa_download_area/cwa13874.pdf) in March 2000 and as American National Standard Z39.85 (http://www.niso.org/standards/resources/Z39-85.pdf) in October 2001, the specification began its progress through ISO to become an International Standard.

The fast-track ballot of ISO DIS 15836 in ISOTC46/SC4 started on 22 August 2002 and will finish on 22 January 2003. As part of the work in the Architecture Working Group, several specifications are nearing completion and review.

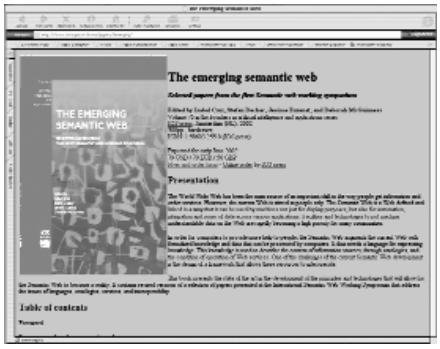
Proceedings are located at http://dublincore.org/groups/architecture/

The Registry Working Group released an updated version of the DCMI Registry in July 2002 with schemas in 21 languages. See: http://wip.dublincore.org:8080/dcregistry/index.html

For details contact Makx Dekkers: mail@makxdekkers.com

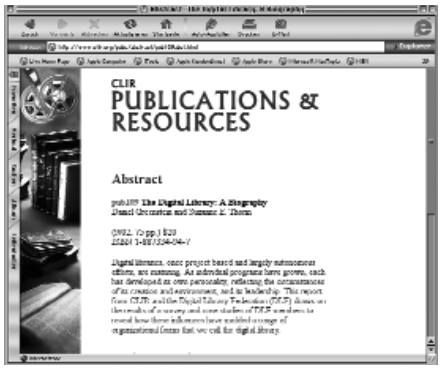
Publications in the Spotlight

The Emerging Semantic Web



This book presents the state of the art in the development of the principles and technologies that will allow the Semantic Web to become a reality. It contains revised versions of a selection of papers presented at the first International Semantic Web Working Symposium (Stanford, July 2001) that address the issues of languages, ontologies, services and interoperability.
http://www.inrialpes.fr/exmo/papers/emerging/

The Digital Library: A Biography



Digital libraries, once project based and largely autonomous efforts, are maturing. As individual programmes have grown, each has developed its own personality, reflecting the circumstances of its creation and environment, and its leadership. This report from the Council on Library and Information Resources (CLIR) and the Digital Library Federation (DLF) draws on the results of a survey and case studies of DLF members to reveal how these influences have moulded a range of organisational forms that we call the digital library.
http://www.clir.org/pubs/abstract/pub109abst.html

The IFLA/FAIFE Summary Reporrt 2002: Libraries, Conflicts and the Internet

This report discusses Internet-accessible information and censorship; presents an overview of the global situation relating to libraries and information services and intellectual freedom; looks at the Internet as the information tool of the 21st century; introduces the topic 'libraries and conflicts', which sadly enough has become more and more pressing for the international library community; and finally discusses some of the possibilities on how to respond when intellectual freedoms are at stake. The report is available from: The IFLA/FAIFE Office: faife@ifla.org (Price: 10 USD).
http://www.ifla.org/V/press/faife02-pr.htm

New Products

W3C's Editor/Browser: Amaya

Amaya is a browser/authoring tool for publishing documents on the Web. It is used to demonstrate and test many of the new developments in Web protocols and data formats. Given the fast-moving nature of Web technology, Amaya has a central role to play. It is versatile and extensible and is available on both Unix and Windows '95/NT platforms. Amaya has a counterpart called Jigsaw, which plays a similar role on the server side. Amaya is a complete Web browsing and authoring environment and comes equipped with a 'WYSIWYG style' of interface, similar to that of the most popular commercial browsers. With such an interface, users can easily generate HTML and XHTML pages, as well as CSS style sheets, MathML expressions, and SVG drawings (full support of SVG is not yet available, however). Amaya includes a collaborative annotation application based on Resource Description Framework (RDF), XLink and XPointer. The current public release is Amaya 6.2 and is available both in source code and ready-to-use forms. The Amaya software is written in C and is available for Windows, Unix platforms and Mac OS X.
The editor/browser can be freely downloaded from the W3C site:
http://www.w3.org/Amaya/

Metadata harvesting: Arc source code available

The Digital Library Group at the Old Dominion University is pleased to announce the availability of Arc through SourceForge. Arc is released under the NCSA Open Source License. Arc is a federated search service based on the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). It includes a harvester, which harvests OAI-PMH 1.x and 2.0 compliant repositories, a search engine together with a simple and advanced search interface, and an OAI-PMH layer over harvested metadata. It is based on Java Servlet technology and requires JDK1.4, Tomcat 4.0x, and a RDBMS server (tested with Oracle and MySQL). Arc can be configured for a specific community, which is encouraged to participate in (besides using) extending and enhancing Arc by providing support for parallel metadata sets specific to different communities, enhancing and customising search interfaces, adding post-processing etc. A demonstration instantiation is running at http://arc.cs.odu.edu, which currently harvests some 100 OAI-PMH compliant repositories.
http://sourceforge.net/projects/oaiarc

CA introduces multivendor storage management software

Computer Associates International Inc. announced on 23 September a storage management application that discovers devices on a storage-area network (SAN), automates backups across multivendor platforms and works from a Web portal - giving it the ability to consolidate the management of remote office storage environments. Some analysts are calling CA's new Bright Stor Portal management software almost unique in its ability to integrate multivendor backup products under a single management umbrella. The Islandia, NY, based company's product uses a browser interface to let storage administrators access and control their networked storage resources across a variety of platforms and operating systems. CA uses an XML-based interface it calls iSponsor/iGateway technology to integrate with storage management applications from Network Appliance Inc., StoreAge Networking Technologies Ltd, Fort Hill Systems Inc. (formerly Cache Ware Inc.) and LXI Corp., as well as CA's own BrightStor storage management applications, including BrightStor Enterprise Backup, BrightStor ARCserve Backup, BrightStor SRM and BrightStor SAN Manager.
http://www.idg.net/ic_952173_1773_1-3921.html

Call for Papers

Hong Kong 2003 Conference: Technoscience, Material Culture and Everyday Life
26-29 March 2003
The Chinese University of Hong Kong, China
This conference will explore the growing interconnectedness of technoscience, culture and everyday life in the twenty-first century global village. With the previously separated categories of science and technology inexorably merging in postmodern society, technoscience is reshaping not only our daily lives, but also the ways that we define who we are. As the new mechanisms of technoscience change our cultural forms and practice, and as the diverse implications of new means of storing and communicating information affect how we view our communities, our identities and our bodies, cultural critics need to examine how all these factors are altering our conditions of perception and the prevailing structure of cultural experience. Paper proposals must be received by January 10, 2003.
http://logic.itsc.cuhk.edu.hk/~b105685/home.htm

ACH/ALLC 2003: Web X: A Decade of the World Wide Web
29 May - 2 June 2003
University of Georgia, Athens, GA, USA
The joint conference of the Association for Computers and the Humanities and the Association for Literary and Linguistic Computing is the oldest established meeting of scholars working at the intersection of advanced information technologies and the humanities, annually attracting a distinguished international community at the forefront of their fields. The theme for the 2003 conference is 'Web X: A Decade of the World Wide Web', and it will include plenary addresses by leading scholars, including Marie-Laure Ryan, author of 'Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media' and 'Cyberspace Textuality: Computer Technology and Literary Theory'. Deadline for Papers: November 15, 2002
http://www.english.uga.edu/webx/

Upcoming Events

OCTOBER

XML Finland 2002: Towards the Semantic Web and Web Services
21-22 October
Marina Congress Center, Helsinki, Finland
XML Finland Association invites all interested people from industry and academia to participate in its seventh annual seminar, XML Finland 2002. The seminar serves as a meeting point for the different interest groups, from experienced professionals to new users of XML and related technologies. The main themes of this year's seminar are Semantic Web and Web Services.
http://www.xml-finland.org/events/xml2002/

Ptolemee 2002: Solution Forum for the Development of Museums, Heritage Sites & Cultural Facilities
22-23 October
Cité des sciences et de l'industrie, Paris, France
http://www.forum-ptolemee.com

CALSI 2002 Workshop on E-contents: Contents and Legal Aspects in the Information Society
October 22-23
Polytechnic University of Valencia, Spain
CALSI 2002 is the first Workshop on E-contents: Contents and Legal Aspects in the Information Society, and it aims to become a discussion forum for the growing number of researchers and professionals interested in the subject. The event organisers would like to foster the exchange of ideas between those attending the Workshop in an environment where intellectual freedom, academic rigour and communication combine; they want to provide a channel for discussion about the many issues raised by royalties in the Information Society.
http://www.calsi.org/

VII Conference on European Culture
23-26 October
Universidad de Navarra, Pamplona, Spain
http://www.unav.es/cee/viicongre.html

Collections Revealed: The Role and Practical Application of Collection Descriptions
31 October
CIMI Institute, Edinburgh, UK
This forum will present an introduction to collection-level description, including examples of recent programmes and projects. It will introduce different approaches to collection-level description, and explore how it might be applied to the description of museum resources.
http://www.cimi.org/ci/ci_1002_forum_ann.html

NOVEMBER

IST 2002 Conference: Partnerships for the Future
4-6 November
Copenhagen, Denmark
http://europa.eu.int/information_society/programmes/research/ist_event_2002/index_en.htm

EVA 2002 Berlin: Electronic Imaging & the Visual Arts Conference
6-8 November
Berlin, Germany
http://www.gfai.de/pinboard/eva/e_index.htm

ELPUB2002 Technology Interactions
6-9 November
Karlovy Vary, Czech Republic
This scientific conference will explore the various interrelations between the different areas of electronic publishing. Forty-nine authors from 16 countries will present their work. The presentations will deal with development and application concepts of new digital technologies as well as with the broader socio-cultural aspects and organisational issues and scenarios of electronic publishing. The programme will be completed by cutting-edge product presentations and a couple of social events in the unique atmosphere of one of Europe's oldest and most beautiful hotels, the Grandhotel Pupp.
http://www.tu-chemnitz.de/elpub02/

Bibliopolis: The Future History of the Book
7-8 November
Koninklijke Bibliotheek, The Hague, The Netherlands
The central theme of this conference will be the influence of new media on book-historical research and new directions in book history. During the conference, Bibliopolis will be presented: Since 1998, the National Library of the Netherlands has been engaged in a project to create an electronic information system on the history of the printed book in the Netherlands. This project has resulted in an interactive tool, entitled Bibliopolis, based on World Wide Web (WWW) technology. Bibliopolis consists of various components: a concise history of the printed book in the Netherlands; an image database; biographical and bibliographical data; full-text digital copies of important book-historical studies; and various bibliographic tools.
http://www.kb.nl/coop/bibliopoliscongres

Knowledge Management Conference: KM Europe 2002
13-15 November
London, UK
http://www.kmeurope.com

Computers and the History of Art (CHArt)
14-15 November
The British Academy, London, UK
http://www.chart.ac.uk/

International Conference on Libraries, Civil Society and Social Development
14-16 November
Sofia, Bulgaria
http://slim.emporia.edu/globenet/sofia2002

Upcoming Events

DigiCULT Forum, Essen, © Salzburg Research

European Expert Seminar on Methods of Digital Archival Description and Access
21-22 November
Copenhagen, Denmark
Organised by the State Archives, the purpose of this seminar is to present new ideas and to learn what is going on in the other European countries in the field of digital archival description and access. Some of the main issues on access will be the questions of retrieval methods, search methodologies and presentation techniques using the potentialities of the Web. What strategies are being chosen and why? What is the experience in different countries? How to address different user needs and behaviour in relation to different access strategies on the Web?
http://www.sa.dk/sa/omarkiverne/english/activities/euseminar/

Conference on Current Trends in Theory and Practice of Informatics
24-29 November
Milovy, Czech Republic
Feature-based techniques for content-based retrieval have been studied for quite some time. What is now needed is for researchers to develop approaches to extract semantics from multimedia documents so that retrieval using concept-based queries can be tailored to individual users. Topics of the conference and accompanying workshops include Computer Science Theory, Education in Computer Science, and Multimedia, Databases and Vision.
http://www.sofsem.cz/

OAIS Training Seminar
28-29 November
The Black Diamond, Royal Library, Copenhagen, Denmark
Co-hosted by ERPANET and the Royal Library of Denmark, this training seminar on the Open Archival Information System (OAIS) Model will provide participants with an opportunity to learn about and interpret the OAIS Model and its wider applications. The seminar has been designed to appeal to a broad array of information professions, public bodies, commercial as well as non-profit organisations, researchers, and anyone with an interest in learning more about the preservation of digital information.
Please register by 10 November at *www.erpanet.org.*
For any additional information, please contact *British.Editor@Erpanet.org*

DECEMBER

EVA 2002 Moscow: Electronic Imaging & the Visual Arts Conference
2-7 December
Tretyakov Gallery, Moscow, Russian Federation
While the conference theme, Information for all: Culture and Information Society Technologies, might not be particularly stimulating, the programme of EVA Moscow looks very promising. It includes various conferences, workshops, exhibitions and cultural visits to several museums, galleries and libraries in Moscow. Topics are within the field of 'Culture x Technology' and are focused on international cooperation. Participation is free of charge and official registration closes on 15 October.
http://www.evarussia.ru/eva2002/english/index.html

Online Information 2002 Conference
3-5 December
Olympia Grand Hall, London, UK
http://www.online-information.co.uk/online/conference.asp

Workshop: Open Access to Hidden Resources
6-7 December
National Library, Lisbon, Portugal
The objective of this workshop is to bring together organisations that work in the archival and library fields in order to explore whether, and under what conditions, the open archive approach is viable for these organisations. It also intends to promote the establishment of new collaborative links aimed at building interoperable infrastructures for supporting the dissemination of both archival and library resources. A tutorial on the implementation of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) will be held in the afternoon before the workshop for those who are not familiar with this protocol.
http://www.oaforum.org/workshops/

EuroWeb 2002: 2nd European World Wide Web Conference
December 17-18
St Anne's College, Oxford, UK
The conference theme is intended to prompt debate on convergence of developments pioneered for e-science on the GRID and web services in order to provide business applications. The communities who identify with the Web, the GRID, Web Services, Grid Services and Semantic Web should not be isolated from each other, but need to come together to unify their approaches to meet the real needs of information, data and knowledge technology users. EuroWeb 2002 will be a major international forum at which research on GRIDs and Web Services is presented. EuroWeb 2002 follows on from the success of the EuroWeb 2001, which was held in Pisa in December, 2001 on the topic of the web in public administration.
http://www.w3c.rl.ac.uk/Euroweb/


© Jon Ippolito

THE EPHEMERAL WILL ENDURE: THE FUTURE OF CONCEPTUAL ART AND DIGITAL PRESERVATION

AN INTERVIEW WITH JON IPPOLITO, CO-ORDINATOR OF THE VARIABLE MEDIA INITIATIVE AT THE GUGGENHEIM MUSEUM, NEW YORK, AUGUST 2002.

BY REBECCA SHARP

If there is one thing worth bearing in mind when considering conceptual art, regardless of personal taste or aesthetic sensibilities, it is that experience takes precedence over the object. Looking through art history, we can see that, in the hands of the Pop-artists and Abstract Expressionists, mechanisms of production and reproduction were manipulated and disseminated, the tools and symbols of industry used and abused. The ensuing generation of artists working in the post-industrial age was left simultaneously exhilarated and inhibited by the possibilities stemming from the exploits of their predecessors. The very plasticity of the artwork had been deconstructed and left for dead, almost, so that the new breed of artists were able to take heart in the dematerialised art object, casting aside old moulds of presentation and concentrating on the concept as dislocated from its carrier.

The format and presentation of conceptual art is constantly changing, as the palette available to artists continues to grow by the minute. In the age of the Internet and with the advent of digital storage, even such media as performance, video or environmental art become quaint. It is true that disembodied art is liberating on some levels, if we consider again that works should be regarded experientially rather than materialistically. However, it is no less critical to preserve a work of conceptual art than it is a Matisse or a Rembrandt, if there is to be an art history to look back on in the future, that goes beyond the realm of academia.

Such is the philosophy behind the Variable Media Initiative at the Guggenheim Museum, New York http://www.guggenheim.org/variablemedia/. Combining input from artists with that of museum and media consultants, the Initiative aims to define works according to medium-independent 'behaviours' (Installed, Performed, Interactive, Repro-duced, Duplicated, Encoded, Networked) and, with the approval of the artists, to design preservation strategies appropriate to each artwork. To aid artists and museum staff in establishing these variable media guidelines, the artist completes a questionnaire, which seeks to identify best practice in translating the artwork into new media for purposes of preservation and documentation.

While the increasing abundance and diversity of artworks that make use of new media are to be celebrated and encouraged, there are issues to be addressed, lest this latest movement in art history be consigned forever to little more than a fad or simple misadventure. This is just one of many concerns for Jon Ippolito, Assistant Curator of Media Arts at the Guggenheim, in his role as joint Co-ordinator of the VMI. A practising visual artist himself, Ippolito is all too aware of the issues faced by artists who are striving to create work in forms that are both accessible and challenging to the viewer.

The alienating effect that new technologies can have on an audience is in direct opposition to artists' desire to have their work seen by as large and diverse a group as possible. Increasing access to artworks, particularly in the case of many environmental pieces, can result in degradation that is not always intentional or desirable. Meanwhile, the most technologically literate artist may create a piece in what he or she considers to be the most cutting-edge medium today, only to find that that technology itself will become obsolete in a few years' time. And yet to preserve the technology is arguably to admit that the form is to some extent more significant than the content, that, once again, the medium is taking centre stage, while the message is in danger of being lost in the distant sprawl.

At the *Preserving the Immaterial* conference, held at the Guggenheim in March 2001, Ippolito stated his belief that it is a mistake to let media guide all description of an artwork, given the danger of a particular medium becoming obsolete. There is, however, a conceivable risk that artists will start creating work from a materialistic standpoint, at the expense of conceptual or experiential factors. While at times this approach may be entirely conscious and deliberate, it could present restrictions that otherwise would not have warranted concern. Ippolito believes that: 'It is that way already - artists are defined

by the medium they work in - as painters or sculptors for example, in the Greenbergian scheme. Yes, the danger is that the work will not endure if artists rely on media, but it does tend to define them from the outset.'

This, then, is where the questionnaire plays a central role. In allowing artists to specify preservation and dissemination options according to the properties unique to their work, the question of medium becomes less important than does the question of how that medium is treated and regarded. One of the case studies in the VMI paradigm is Felix Gonzales-Torres' *Untitled (Public Opinion)*, which actively utilises concepts of variability and degradation: a large pile of candy is placed in a corner of the gallery, while visitors are encouraged to take pieces from the pile. In this case and in the case of works that conversely embrace ideas of reproduction and replication, issues of intellectual copyright come into play. If the artwork is so dependent on the process of variability and that process relies on audience interaction, then it becomes more complicated to control authorship and ownership than if it were just another picture hung on a wall. Ippolito considers: 'There is definitely a need for new schemes to address these issues. We must consider, what is the museum acquiring? The right to reproduce art. Artists [at the VMI] make their material available by using Open Source http://www.opensource.org/ and keeping access closed is a mistake. The artists are as keen as anyone to keep access open.' The key lies in maintaining good communication between artists and museum staff, as Ippolito goes on to say: 'There is the Deferred Rights Agreement, by which artists may keep the source code invisible for five years, after which time it becomes available to the museum. Intellectual copyright may be a good reason for artists to control reproduction, but it makes the work more vulnerable in the long term.'

Another key concern that stems from the question of copyright is that of responsibility. The VMI questionnaire actively takes into consideration the role of the artist, so it would seem there should also be a need to formalise the role of the owner. Does it not follow that it would be crucial to outline the difference between the rights of an owner of an artwork and their responsibilities? Ippolito agrees: 'It is a very interesting issue. It has been largely dealt with by the Acquisition Agreement that is drawn up when a gallery acquires a new work. It also depends on the nature of the piece - the Guggenheim recently acquired a Website that specified public accessibility.'

The variable media paradigm seems to be mostly about formalising the roles of all the people who play a part in the lifecycle of an artwork, while keeping open lines of communication between all parties. As with the issue of concern over media usurping concern over meaning, it is not inconceivable that perfectionist methods of preservation may also become a fixation, having a detrimental effect of variance on a work. Ippolito largely dismisses this apprehension: 'There are two definitions of being true to a work: to be true to the material, and to be true to the artist's intent. When concentrating on one, it is important not to neglect other issues. There is the danger of focussing too closely on artist intent and missing issues associated with public-use intent. But perfectionism is a good thing, so long as it's seen from all angles.' Once again then, collaboration and communication are key.

With the exception of the ever-changing and quintessentially variable Robert Morris Site performance, most of the VMI case study works are held in permanent collections at the Guggenheim. So it would seem that the issue of permanence in variable media has largely been overcome, for the time being, at least. What remains a more challenging task is the relocation of works for temporary shows. As Ippolito says: 'Some works, for example Meg Webster's *Stick Spiral* and Janet Cardiff's work that deals with issues of spatial migration, actually consider themes of transience and fluctuation. Meg Webster stipulates that the twigs used for the *Stick Spiral* must be collected from fresh cuttings in the vicinity of the exhibition space. The questionnaire covers all issues that need to be resolved to reconstruct a work, whether permanently or temporarily.'

In the discussion and treatment of a great deal of contemporary art, much attention is paid to increasing public access and interaction. While the VMI has made formidable progress in establishing best practice in this and other areas, the role and intentions of the artist remain fundamental. Are there or should there be different methods for documenting the artist's intent, be it original or retrospective, from those for treating the artwork itself? Would this resulting dislocation of process from product effectively necessitate the creation of a whole separate paradigm? The answer lies in the structures set up by the VMI and in taking each work as it comes: 'Condition reports are carried out to record the physical status of a work, but overall it depends on the definition of the work according to the variable media guidelines. There is a danger of becoming obsessed with irrelevant detail when confusing the intent with the medium – for example, one occasion when gallery employees were installing a Bill Viola video piece, taking a condition report so that it could be set up exactly as Viola had intended. They were taking note of the fingerprints that were all over the video player, when they should have been worrying about things like: Do they have enough cable?'

Therefore, while technical specifications can be crucial, it is necessary to be able to see them in conjunction with all the other elements of the work and adapt accordingly. The central structure of the paradigm attributes a different behaviour type to each work being considered. Ippolito describes the process by which different strategies are appropriated for documentation and preservation for each of these behaviours: 'The artist decides which methods are relevant when com-

pleting the questionnaire. So the technical requirements change – for example, with a reproduced work, there will be a level of degradation from master to sub-master and storage might be required, whereas a duplicable work, which involves no loss, just needs details of how to acquire the objects or ingredients needed to construct the work.'

It would appear that every eventuality has been accounted for, no small feat when you consider that this is an initiative dealing with works in 'ephemeral media'. However, while the paradigm is deliberately not prescriptive and the questionnaire by necessity not exhaustive, there are some technical elements of the documentation process that allow the initiative to function effectively. 'Some would say the whole questionnaire is about metadata. But some fields are concerned with consistency across institutions. This is a new paradigm, which is developing an inter-institutional database of works in variable media from seven institutions. This will mean that, when online, you can look at what other institutions have been doing and share ideas, compare case studies. So it's all about metadata, consistency and formalising practices.'

While the issue of accessibility might have produced security concerns in any other context, not so at the Guggenheim: 'The emphasis is really more on keeping the art in the public domain rather than keeping it in private. We might use a database with lockout protocols, and encryption is good, but we don't try to keep anything secret. The VMI is about time and limits – how long can we go with the current state of the artwork? It's a temporal frame, not a spatial one. So it's better - and the artists want this too - to increase access rather than worry about keeping people out.' Indeed, collaboration and interaction form the heart of the VMI, with a broad range of consultants and contributing Guggenheim staff comprised of artists, curators, and museum, preservation and media professionals. This would appear to be its main strength, in enabling artists and institutions to reach a consensus on how the dematerialised art object can be allowed to survive in such a fluctuating technological and cultural climate.

So too is the initiative's sensitivity to the artistic process a key feature of its early success. Far from being brains in a vat or relics in a dusty vault, at the VMI the artist's imagination is encouraged to explore a whole new realm of possibilities, exhilarating as always, and free now of the inhibitions that would otherwise threaten both spontaneity and longevity.

Seven Strategic Issues for Cultural Age Digital Libraries

By Gregory Crane, Professor of Classics at Tufts University, Winnick Family Chair of Technology and Entrepreneurship and Editor-in-Chief of the Perseus Project

In the United States, the National Science Digital Library constitutes arguably the largest single digital library effort in the academic world (http://www.nsdl.nsf.gov). With tens of millions of dollars in funding and dozens of collaborators, the NSDL strives to revolutionise all levels of scientific learning. But while the NSDL is conceived as a multi-agency effort, its focus on scientific education poses both opportunities and challenges for those of us working in the humanities. The NSDL is important not only in itself but because it reflects the broader phenomenon that most digital funding is aimed at scientific data. Those of us working in the United States, for example, will probably encounter substantial pressure to build on the infrastructure that our colleagues in projects such as the NSDL have established. We therefore have an obligation to participate as early as possible in projects such as the NSDL and in digital library development in particular. If we do not take an active role in defining the particular needs of cultural heritage collections, we may find ourselves confronted with systems that work well for circulating physics pre-prints or biological datasets but are ill-suited to the needs of historical and cultural materials.

The following seven strategic needs of cultural heritage digital libraries are offered as a starting point for debate and an instrument to provoke discussion rather than as an, in any sense, final list of recommendations. For a more detailed discussion of this topic, see Crane, G. (2002), *Cultural Heritage Digital Libraries: Needs and Components.* European Conference on Digital Libraries, Rome; Springer.

Historical data become more valuable over time - persistence is crucial: Cultural heritage digital libraries must aggressively address the problem of digital preservation. The problem is particularly serious for complex knowledge sources such as lexica or encyclopedias. Humanists may be less able than their colleagues to retrofit gigabytes of complex materials, but humanist reference works are used for decades, if not longer.

Access to the cultural heritage of humanity is a right, not a privilege: The record of human achievement is a public good and should be accessible to every citizen. At present, private corpora-

tions have undertaken the crucial task of digitising some critical corpora and have produced intellectual gated communities. These electronic resources, tightly controlled and often priced in such a way as to guarantee a limited audience, restrict fundamental source materials to the same academic elites that had access to scarce print resources. A socio-economic infrastructure has thus begun to arise that imposes on the digital world limitations of print. We need economic models that do not replicate practices that isolate cultural heritage from the community as a whole. Governmental approaches are, however, also problematic, since governments may feel an obligation, explicit or not, to control their national image and impose restrictions on information.

Cultural heritage digital libraries must serve the needs of diverse audiences:

Access to information is necessary but not sufficient. Customisation is a rapidly growing field of inquiry. The system should adapt to the needs of its users, providing them with the information that they need to interpret new documents or topics, reducing, insofar as possible, the friction of their movement through a digital library. There are limits to this - as Euclid reportedly rebuked the first Ptolemy with the statement that there is 'no Royal Road to geometry',[1] some concepts are simply difficult. Nevertheless, a humanities digital library has a social obligation to support the development of complex skills, by a wide audience, over a long period of time.

The *documents within* cultural heritage digital libraries must serve the needs of diverse audiences:

Humanists cannot simply rely upon elaborate technologies to enhance their contributions to society as a whole. The Internet already reaches a huge audience and could within a very near future saturate the households of the advanced countries. The Perseus Digital Library Website has, for example, emerged as a major distribution channel within classics and now disseminates up to 9,000,000 pages of data per month to an audience far beyond traditional academia. Humanists - especially those who participate in scholarly debates that span decades or more - must think carefully about how they will respond to this vast new and expanding audience. We need to ponder both the way in which we write and the questions that we pursue. Maintaining the status quo and dismissing this new audience is itself a strong, if problematic, response.

The library is a laboratory where reading is a primary exercise:

To some extent, this is a superset of the customisation problem. A great deal of DL research addresses the cataloguing problem. A digital library is a structured space that manages a large number of objects. The user searches through the DL to find objects of interest, but, once these have been found, many systems simply hand control over to the object and the user calls up a PDF viewer etc. Humanists often study texts, images and spaces in extremely close detail. Thus, the numbered citation schemes of computer science publications - which direct readers to a document as a whole - reflect a much less general attitude to textual reference: humanists are trained to cite precise pages and, when dealing with canonical documents, often cite individual lines or words. In this environment, the granularity is much finer and users need support with words and phrases as well as with documents as a whole. The implications are, however, profound for the scale and design of humanities DLs: when each word becomes a complex multidimensional object, density of data increases by several orders of magnitude. Cultural heritage materials raise challenges that go beyond those described in the literature about citation harvesting and linking from recent scientific publication.

Digital objects and their components must be freely reusable:

Simple access to information is not sufficient. We need complex documents that include and provide distinct visualisations of components from many sources, e.g. details from high-resolution images, clips of time-based media, tabular or graphic visualisations of data sets, quotations from larger works, and links from each inclusion to the source.

Standards/best practice must be descriptive rather than prescriptive:

New publication series can impose guidelines on the form and structure of documents. The variations of historical sources can provide crucial information. We thus need to preserve, rather than eliminate, vagaries of spelling in early modern texts since these variations can provide important data about the compositional history of a given text (e.g. compositors often provide the actual spelling and uses of 'do' vs 'doe,' which, for example, can help determine who is responsible for what section of Shakespeare's First Folio). The need for 'prescriptive' rather than 'descriptive' encoding demands a consequently far more complex encoding scheme and software infrastructure. This requirement generates a need in turn for specialised viewers, which can, for example, filter and display very precise differences between editions. While the underlying ideas are similar to the well-known problem of versioning source code, a cultural heritage versioning system requires substantially more precision of reference and semantics: editors within the New Variorum Shakespeare series, for example, formally distinguish between 'substantive' and 'semi-substantive' changes to the text. A versioning system must be able to manage a wide variety of such classes.

Over the coming year we will be continuing to shape our understanding and thinking on these issues and to develop the recommendations to ensure that the needs of the humanities are reflected more strategically in digital library activities in the US and abroad. But we have already begun the long road of thinking on these issues.

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[1]Reported by Proclus in his description of Euclid: see http://ww.perseus.tufts.edu/cgi-bin/ptext?doc=Perseus:text:1999.01.0086&query=head%3D%232&word=Euclid.)

A European Network of Excellence on Electronic Archives

By John Symon, AIIM International Europe, and Claes Granstrom, Riksarkivet, Sweden

Aim and Purpose

The content of public archives is part of the cultural and knowledge heritage of mankind that has to be secured for use by present and future generations. The task of safeguarding and ensuring the continued accessibility of the European archival heritage in the context of the Information Society is of primordial importance and is therefore the primary concern of the DLM. The acronym DLM stands for Document Lifecycle Management - Network of Excellence on Electronic Archives.

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The amount of information is growing rapidly. In the Information Society the situation has radically changed from a need for information by the citizen to an information overflow. Both paper and electronic documents are increasing at an exponential rate. New formats like multimedia documents, digital video and photographs, electronically signed documents and compound objects create new requirements for storage, management and delivery of information. This is a continuous challenge for all archives and record-keeping organisations at all levels of public administration and public services throughout Europe. The rapid change of technologies adds to this challenge.

Archivists are acutely aware of the specific responsibilities that the Information Society imposes on their profession. From custodians of information and guardians of our cultural heritage, they are increasingly also becoming information managers and content providers. As a consequence, they not only have to know how to use the technological tools at their disposal but also have the responsibility to formulate adequate requirements for those tools to the research community and the industry that develops them.

Thus the creation of the DLM Network of Excellence on Electronic Archives in Europe is not a one-time action but a continuous, growing task that must benefit the European archival community, the public administrations in the Member States, candidate countries, other interested bodies and, ultimately, the European citizen. This task has political, legal, technical, organisational and educational aspects.

With the conclusions of the 3rd DLM Forum, in May 2002 in Barcelona, a steering committee was established by the DLM community to launch the DLM Network of Excellence on Electronic Archives in Europe.

Rationale

The document lifecycle management of, and provision of continued access to, digital heritage and cultural objects is recognised internationally as an issue that requires concerted action by information professionals, academic researchers, administrators and industry. In the EU context, a 1994 experts' report identified this very issue as one that required similar concerted action and one that necessitated co-operation between Member States and at Community level. The preparation of this experts' report was the result of an invitation contained in a resolution of the Council and the Ministers of Culture calling upon the Commission to set up a group of experts to examine and report on the extent to which greater co-ordination of archives policy and practice within the Community was desirable. The conclusions and recommendations of these experts were noted and endorsed by the Council of the European Union Conclusions of 17 June 1994.

These recommendations included one on the organisation of a multi-disciplinary forum, to be held in the framework of the Community, on the problems of the management, storage, conservation and retrieval of information in digital format, in which representatives of public administrations and national archives services, as well as representatives of industry and research, would be invited to participate.

The resultant DLM Forums in 1996, 1999 and again in 2002 were invaluable steps in attempting to achieve a measure of concerted action by all relevant parties. These forums stressed the importance of ensuring that archives, and the digital formats of which they are increasingly comprised, are the collective memory of the Community and that their preservation and continued accessibility are essential. Papers presented at the DLM Forum in 1996 pointed to the importance of digital archives in the context of the European Union's concept of the Information Society and of the wider significance of access to them in the context of the citizens' right to information.

Objectives

The Network of Excellence that will be embodied in the proposed DLM Network project aims to complement the DLM initiative by creating a network of expertise and competence in the area of digital document lifecycle management and access to public information that reaches the broadest possible constituencies. Through the creation of a network, it is hoped to further the DLM aim of bringing diverse stakeholders together, to use their expertise and knowledge, and to share this information among the Community Member States and elsewhere in Europe. It aims to identify and promote research endeavours and products that enable private and public institutions in Europe.

Through its thematic seminars and training workshops, the proposed DLM Network will further contribute to the wider Community aims of exploiting more fully the benefits of the Information Society as set out in the eEurope Action Plan by:

- offering relevant training opportunities tailored to target groups and those who are at risk of seeing their skills overtaken by rapid change;
- forming a network of learning and training centres for demand-driven information, and communications technology training;
- fostering collaboration between private industry and public organisations;
- closing the digital divide between countries in the area of digital document lifecycle management and access to public information by allowing smaller nations the opportunity to participate in a wider research network; and
- fostering links between industry and other stakeholders in the area of digital document lifecycle management and access to public information.

The proposed network will also contribute significantly to the identification of areas of digital document lifecycle management and access to public information requiring further research and investigation, and standardisation and regulation. In addition, the knowledge base developed will assist in the identification of new areas of e-initiative that can be stimulated to create employment and to bring the European Union to the forefront of the information industry.

As a Community-wide project, the DLM Network will facilitate pooling of the complementary expertise that exists across the academic research, cultural, public administration and industry sectors in Europe and will focus on the research activities required. The problem of developing the solutions required for document lifecycle management and access to public information is one that is faced in varying degrees by all of the sectors mentioned above. However, it is one that is too immense to permit the development of viable solutions by any one sector.

A project undertaken at European level will avoid duplication of effort by individual organisations and/or in different sectors within the Community and will ensure that scarce resources, including financial and human, will be used more effectively and efficiently.

To ensure that all interested sectors, and ultimately the citizen, benefit, a European-wide project - independent yet representative of different interests and perspectives - is necessary. It is essential that the knowledge-base built and expertise developed will not remain the preserve of any one sector, but will be shared among all, including:

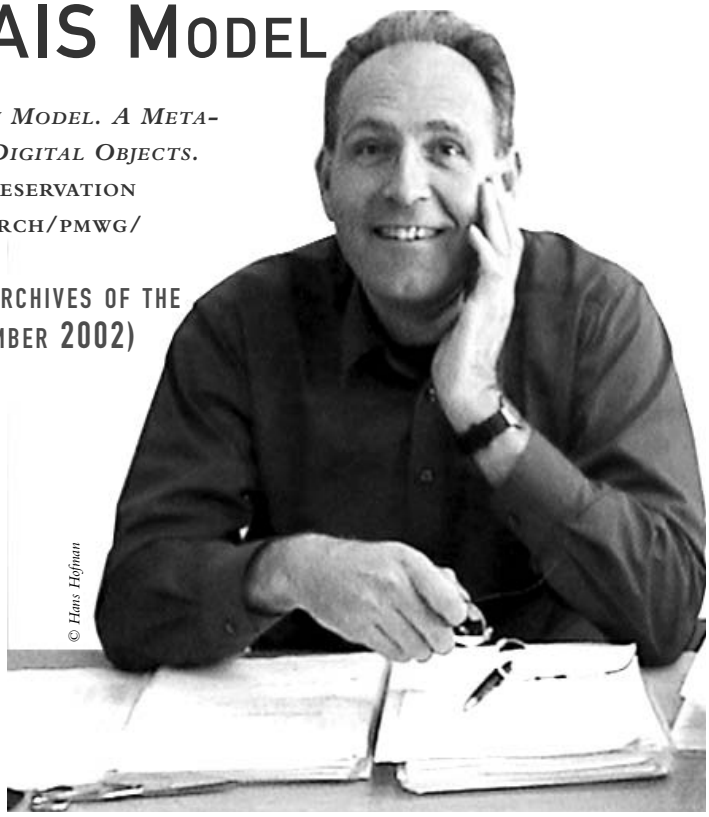
- those charged with responsibility for the document lifecycle management and provision of access to e-content;
- those in academia with a research interest in e-content issues; educators responsible for the education and training of information professionals; and
- those in the information and telecommunications industries involved in the development of new products.

As participants will be drawn from the European Union and other European countries with a variety of legal and juridical contexts, research findings will be rigorously tested in differing circumstances, something which should make the knowledge and expertise developed more widely applicable. It will also allow the identification of national laws of the Member States in relation to such matters as access to information, protection of personal privacy and copyright, where greater harmonisation can be achieved and areas of activity requiring regulation at the European Community level addressed. Ultimately, greater integration of effort in a common area of concern across EU Member States will be fostered.

Review: Some Comments on Preservation Metadata and the OAIS Model

Preservation Metadata and the OAIS Information Model. A Metadata Framework to Support the Preservation of Digital Objects. Report by the OCLC/RLG Working Group on Preservation Metadata, June 2002: http://www.oclc.org/research/pmwg/

By Hans Hofman, Senior Advisor at the National Archives of the Netherlands and Co-Director of ERPANET (September 2002)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Introduction

The reference models for preservation that exist at the moment, such as the well-known OAIS (Open Archival Information System) model, focus mainly on the functions and processes for preservation, not on metadata. This is, however, an essential part of the whole model. The OAIS includes a high-level, object-oriented information model. So far some attempts have been made to produce sets of metadata for preservation purposes, but none has covered as much of the OAIS reference model as the one now published by the Working Group on preservation metadata of OCLC/RLG. The version of June 2002 is available at: http://www.oclc.org/research/pmwg/

The Working Group has performed a remarkable job in trying to identify more precisely what metadata are necessary to preserve (certain types of) digital objects. Because of the predominance of the OAIS model, any related contributions will subsequently have an impact on the thinking on this issue. It is therefore important to be aware of the strengths and weaknesses or limitations of the presented metadata approach by putting it into a broader context. On a worldwide level, there are further initiatives under way that are trying to deal with this issue. Examples are the ISO work on record management metadata, which also includes preservation metadata, and the work of the National Library of New Zealand, which, though not yet published, is another interesting and important development. And most likely there will be others. Since the OAIS model could, in principle, also be applicable for electronic records, it will be interesting to see how this metadata report will or can accommodate records management and archival needs. Lastly, questions arise, such as whether there should be more co-ordination, and whether there should be a (kind of) standard, and, if so, how this can be achieved and who and what disciplines should be involved.

My comments are two-fold: first, what can be said about this preservation metadata set in general and, secondly, to what extent does it cover the needs of the records management and archival community in preserving (archival) records? In addressing these questions, I will draw among others on the conclusions of the work being carried out in the Preservation Task Force of the first Inter Pares project with regard to the preservation of authentic electronic records. The results are available at: http://www.interpares.org

1. The Preservation Metadata Set in General

The terminology used by librarians is sometimes confusing for archivists, and vice versa, I assume. Terms like provenance, archiving, context, records, etc. are used with slightly different meanings. This is already inherent in the OAIS model itself, so any discussion about preservation is challenged by confusion of terminology. It requires records managers and archivists (and perhaps other information professionals) to be aware of these differences and to make a translation of such terms to their own domain.

The term 'records' is used, for instance, as a sub-sub-element of 'Resource Description' (under Reference Information) named 'existing records', which refers to existing metadata records. In the archival community this term has a very specific meaning, records document and are evidence of business activities. When applying the metadata model for a wider audience, more awareness of the issue of terminology is required, for instance by including clear definitions of key terms. The terms as used in the OAIS model and accordingly in this proposed set of metadata, such as digital objects, data objects, data content objects,

information objects, have or may have a relationship with each other, but in other cases may not, or may overlap, or may have different meanings. The term 'digital object' is the most ambiguous, since it refers to both conceptual and technical aspects, i.e. the intellectual content and its form, and the way it is digitally represented. At least, this is the way I will be using it in this article.

In this respect it is essential to know the underlying concepts in order to understand the metadata set, and I think more discussion is needed in this area. It is, despite some definitions, not always quite clear what these concepts are or what they really mean.

Scope

The preservation metadata set, as presented, is a kind of compilation and elaboration of the work on metadata undertaken in different projects (NEDLIB and CEDARS) and by different organisations (OCLC and NLA), and as such can be considered very useful. Thus the background is mainly the library community, as is also obvious looking at the composition of the Working Group. The title suggests, however, that this proposed set of metadata is applicable to all digital objects in all domains. On p.3 it is indicated that it should 'accommodate the needs of the library community, along with other institutions tasked with the long-term management of information in digital form'. This is, however, as I will indicate below, not the case and this is one of the restrictions to this proposed set.

In line with the OAIS model, the point of view taken is that of the custodian not being the creator. It supposes that at some moment in time digital objects have to be transferred, brought in, harvested, or ingested into the organisation and system the custodian is managing. Prior to this ingest, the objects are under the control of other organisations, such as publishers or record-creating organisations. The extent to which the management of objects can be influenced differs with respect to the type of objects. In the case of (government) records, legislation governs their creation and management, whereas, in the case of publications, the influence will be mostly based on agreements between producers, publishers and preservers.

This includes also the way metadata are created and maintained. Ideally, there should be continuous and consistent creation and management of the metadata that accompany the digital objects. In practice, there is still a lot to achieve in this respect. So, although the suggestion may sometimes be otherwise, preservation metadata do not only apply to what is under the custody of a cultural or other preserving institution, but should be applied to the whole lifecycle of digital objects. This implies lifecycle management. I use the term lifecycle here as a chain of stages, such as conception or design, creation, maintenance and final disposition (as in the case of government records, destruction or 'sentenced' for having continuous value). During that lifecycle the use of digital (and other) objects may change over time or across domains, because of different contexts, and this will have an impact on the creation and management of metadata. Preservation can be viewed as part of maintenance.

'Preservation metadata' are seen as information necessary to support preservation processes. In the report, however, no link is made to these processes. An analysis of the processes and the kind of information needed to perform them would have been very useful to better understand this proposed metadata set. Without such an analysis it seems more difficult to identify the metadata needed. The Working Group may have considered it implicit since the set is based on the OAIS information model, which again is derived from the functional model. The high level of that model, however, does not make the required metadata immediately clear. In this respect it is also essential to understand the nature of the digital objects that are to be preserved. There is an explicit statement that 'no assumptions about type or structure of digital resource' are made and that no particular preservation strategies are taken into account (p.3). But, by taking library community needs as leading (albeit implicitly), the approach is already restricting the types of digital objects. Managing different types of 'digital objects', e.g. publications and records, may require not entirely similar sets of metadata.

Another issue is that of the requirements governing the preservation processes. Approaching this from the object itself, as is the case in this report, is not sufficient. There needs to be insight and, as a consequence, also metadata about the preservation strategies, policies and methods, together with the context in which the preservation takes place. Although the OAIS model contains functions like 'preservation planning' and 'administration', these are not addressed in the report, perhaps because they are not (yet) reflected in the information model. For a complete overview of preservation metadata, nonetheless, all functions have to be included.

Digital objects

A crucial question in understanding (long-term) preservation of digital objects is: what is a digital object? As already indicated, this seems not as clear-cut as one would expect. In the OAIS model an object of preservation is identified as a data object that can be either physical or digital. A digital (data) object is defined here as 'an object composed of a set of bit sequences', therefore it has to be seen as a (data) file that is stored on the disk and not as the 'thing' that is represented on the screen. The data object is accompanied by so-called 'representation information', which documents the way the data object has to be interpreted in order to present it and to enable intended users to view and understand it. Together, they form the information object. It is a rather technical approach that is taken here. Perhaps the real question should be, what do we want

to preserve? Is it the intellectual content with the functionality it has to have in order to make sense and achieve its purpose, or is it the digital components that are necessary to reproduce it or both? One of the basic notions in a digital environment is the difference between what is shown on the screen and what is stored on the disk or medium. There isn't even always – nor does there have to be - a 1:1-relationship between them. A digital component may contain one or more records, or, conversely, one record may consist of more than one digital component (e.g. in the case of a multimedia record). In many publications this distinction is not explicitly made and it is therefore not always clear what the subject of discussion or the object of preservation is. In general, there is recognition of the disappearance of physical entities, but it seems as if the consequences of this notion are not always drawn.

It is the message or the intellectual content which the author or creator intended to convey that has to be preserved. That content has a context, form and structure and in some cases also behaviour (e.g. spreadsheets). Be it as it is, the terminology used is confusing and not consistent on this point. My view is that 'digital objects' should be seen as objects having both conceptual and technical aspects that are closely interrelated. As a consequence of the explanation given above, a digital object may consist of more than one 'digital component'. The definition given in the OAIS model is therefore insufficient. Moreover, the implications of this concept for the model are not yet adequately considered. The distinction between digital components and intellectual objects as different views or entities requires, as indicated above, not a one-to-one, but a many-to-many, relationship.

What does the OAIS information model and the proposed metadata set say about the conceptual or intellectual aspects? Taking a closer look at what is meant by representation information, it turns out to consist of two categories, 'content data object description' and 'environment description'. Each of these contains (proposed) elements that can tell something about the conceptual aspects of the object we are preserving, e.g. in the case of the first:

- 'significant properties', defined as 'properties of the Content Data Object's rendered content which must be preserved or maintained during successive cycles of preservation process';
- 'functionality', defined as '... any functional or 'look and feel' attributes of the rendered Content Data Object, in regard to its current manifestation in the archival store'; this intends to describe the current technical properties;
- 'description of rendered content', defined as '... Content Data Object's content, in regard to how it should be viewed and interpreted by users'. This includes clarification of potentially ambiguous data, definition and description of data structures, etc.;
- 'documentation', defined as supporting documentation necessary/useful for display and/or interpretation of the Content Data Object;
- in the case of the second, the 'output format' of the 'Display/Access Application', defined as description of the output to be expected from the Display/Access application.

It means we have no fewer than five metadata elements that could contain information on what should be rendered and presented on the screen. How all these elements relate to each other, if at all, is unclear. Another issue in this approach may be that the digital object is only considered to be a technical entity, and as such always seems to be at the centre of attention, not the intellectual object. Based on the question of what should be preserved, one would expect that it would be the other way around, but it is not. To be more precise, in general we want to preserve the intellectual expression (object, if you like), not the digital components of which it consists per se, because, if one thing is obvious in a digital world, it is the fact that these digital components will change over time. Even rigid standardisation will not prevent that, although in the future adequate technologies may probably emerge that make things easier in the area of preservation. This is also why in some reports the preservation of digital objects (i.e. their components) in their original format(s) is recommended. What we want to achieve, however, is that in the future we will still be able to see, read and understand the documents or other information entities that were once produced for a certain purpose and in a certain context. In trying to achieve this, we of course need to preserve these digital components, but, as information technology will evolve, these components have to be migrated or in some cases emulated to be usable on future hard- and software platforms.

Therefore, one of the issues is to identify what the intellectual aspects are. The emerging notion of 'Significant Properties' seems to acknowledge this. In this metadata set, it is identified as an element and may serve as a description of intellectual aspects, if only it is established as such.

Finally, special attention has to be paid to the so-called 'underlying abstract form' (sub-element of 'Content Data Object Description'), a notion that has been introduced and coined by the CEDARS project. Its definition is: a 'human readable description of the Underlying Abstract Form of the Content Data Object'. It intends to provide information about implicit structures (e.g. files and relationships) that should be represented correctly to render or access the 'Object'. As such, it seems to address the relationships between different (digital) objects and not the structure of one single intellectual object, for instance. To avoid this confusion I would like to suggest making a clearer distinction between intellectual and 'technical' or physical

aspects of digital objects. In a recently published article Ken Thibodeau even introduces a third category, i.e. logical objects. This concerns how information is encoded in bits and the grammar (rules) that allows application software to interpret the data. As such, it refers to, for example, the possibility of encoding the same conceptual object in different formats.

See 'The State of Digital Preservation: An International Perspective. Conference Proceedings', July 2002; www.clir.org/pubs/reports/pub107/thibodeau.html

Administrative metadata

Another area that requires attention is the technical information needed to preserve and reproduce the 'digital objects'. This can be seen as part of administrative metadata. The section about 'Content Information' contains, apart from the 'Data Content Object', the category 'Representation Information'. Part of this category is 'Environment Description', which should provide information about the technical (hard- and software) environment necessary to render the data object. It includes information about rendering programs, operating systems, computational resources, storage and peripherals.

Information about the digital data object includes aspects such as technical infrastructure of complex objects, installation requirements, file description, so-called quirks (documenting any loss in functionality or change of look-and-feel), structural type, but also significant properties, etc.

Based on the description given of this section, it only concerns the current technical environment, not information about any previous environments. Is the underlying idea that it will be sufficient to have information about the preservation activities performed such as migration, conversion and their results? This could be a possible approach, but it would have been useful to know the assumptions behind it.

Another question that may be asked here is whether information about the original technical environment should also not be kept or is this supposed to be part of the 'Content Data Object Description'? An understanding of the original technical environment in which the digital objects were created will help to preserve them. Of course, if the digital objects are preserved in their original format, as is recommended in some cases, that information will be held under the category discussed here. Nonetheless, I would like to suggest including an element that reflects the original technical environment.

Most administrative metadata are subordinated under 'Provenance Information' (as part of Preservation Description Information). This category is meant to document the 'Object' as a dynamic entity, considering it to be the result of a never-ending range of activities or an evolutionary process, without which it would not exist. The 'events' metadata are related to the processes or activities carried out in preserving data objects and should provide information about the management history. An issue here may be how to match that information to the requirements that are valid for the system. There has to be an evaluation process (in the OAIS model under 'Administration' Process) that takes care of this and will produce evaluation information (another set of metadata) that can be used to adjust (the performance of) the preservation function or system as such. These aspects are not discussed or included in the metadata set provided here.

2. The Metadata Set and Preserving (Archival) Records

Records and records requirements

The second perspective I would like to address in this article is that of the records and archival communities. The question is, then, to what extent can the preservation metadata set fulfil the needs of preserving records? In order to be able to do so, it is necessary to have an understanding of what records are and what their requirements are.

Records, according to the recently published ISO records management standard 15489, are 'information created, received and maintained as evidence and information by an organisation or person, in pursuance of legal obligations or in the transaction of business'. So, in order to understand, use and interpret records correctly, it is necessary to know their administrative or business context, as well as their interrelationship with other records created in the same context. In order to achieve this, records have to be authentic, i.e., in short, they are what they purport they are. The main requirements for records to serve as evidence or authoritative information sources are therefore authenticity and integrity, and knowledge about the business context and about the interrelationship between records (e.g. in a case file). I will discuss these further in the following paragraphs in relation to the metadata set.

Authenticity: management

Surprisingly enough, the issue of authenticity is hardly touched upon in this report. Does that mean that it is implicit or that it is not really seen as an issue? Unfortunately, no explanation is offered. Since authenticity is one of the main requirements governing preservation of 'digital objects', publications, Websites and (archival) records alike, it will also affect the metadata requirements. Authenticity refers to the requirement to be able to retrace documents or records to their creation (or origin), so that it will be possible to identify why, when, where, by whom and so on they were created (or received) and used. Answers to these questions are needed not only to establish the identity of a record, but also to know whether the information presented is trustworthy or

reliable. In other words, it should be possible to position a record in the time and context in which it purports to originate. After all, if we know somebody or something (or think we know), we are able to establish whether we can trust him, her or it, or not. In order to enable this judgement or assessment we need information that can answer those questions. In a digital environment, in particular, authenticity has become an issue, because digital documents or records by their very nature are intangible and volatile, and easy to tamper with. Apart from information about their origin, information about the management of the records or digital objects is necessary to be able to assess what happened since they were captured and whether something may have occurred that has affected them in a negative sense. Finally, the (conceptual) object itself has to be described: what are its essential characteristics? To some extent these categories of information may be found in the proposed metadata set. Thus it can be indicated, for example, under 'context information' why an object has been created, be it in a rather technical sense, and under 'provenance information' what 'events' have taken place (management history), while under Content Data Object Description 'significant properties' are included, identifying the characteristics of the object that should be preserved. The question is, does this really meet the requirements for maintaining authenticity? It would have been helpful if there had been more acknowledgement of the issue of authenticity and the requirements for it, and if the Working Group had provided some background information about its view and considerations on this aspect and to what extent it is included or not.

Context

As indicated, context information in an archival sense means information about the context in which records are created, i.e. the business activity and the organisation responsible. In this metadata set this is represented by the sub-category (of Context Information) 'Reason for creation', defined as 'documents information about why a content data object was created'. The accompanying explanation indicates that it concerns mainly why a physical object was created. It limits the scope of contextual information to 'informational requirements associated with managing the preservation process'. As such, it only refers to the role a certain data file plays, e.g. master file or similar, a rather technical approach.

For information that helps to understand the background of the digital object, one is referred to 'Representation Information' (i.e. the section Content Data Object Description). In this part the element 'Documentation' is meant to provide the documentation necessary to interpret the 'Content Data Object' and is assumed to be a link to where the documentation is (e.g. a URL). Perhaps this may represent the kind of information I mentioned above. Apparently this information is not considered as preservation metadata. Nonetheless, it is essential for understanding the intellectual objects (publications, documents or records) as represented on the screen and for being able to identify their authenticity. Furthermore, this information must be inextricably linked to the (intellectual) objects themselves. As such, it also has to be preserved and may be an object in itself. And in the case of records, this kind of information or metadata will be created electronically and must be preserved as such. In the Information Model and the derived preservation metadata set this part is not adequately addressed. In order to be able to preserve (archival) records it will therefore be necessary to extend the information model with another class of information that refers to business context. Such a subset could provide a structure for describing what in archival terminology is called information about 'provenance' (with a different meaning from that in OAIS).

Relationships and Aggregations

An area that is not developed to any great extent in this metadata set is that of relationships between objects. I have already discussed the difference between digital or, rather, physical objects (i.e. a data file stored on a medium) and conceptual objects (i.e. a publication or archival record as presented on a screen), which is not necessarily one-to-one. This conclusion entails more complexity and has its implications for defining metadata.
Relationships in the proposed metadata set are now identified as a subset of Context Information (one of the sub-categories of Preservation Description Information). They consist of two sub-categories: 'Manifestation' and 'Intellectual Content'. These relationships can refer either to other manifestations of the same object (= the same content) or, in the case of Intellectual Content, to relationships between this and other objects (with related content). As such, the relationships seem to refer to physical data objects. They cover only part of the relationships necessary to represent the complex network of physical and conceptual objects. Since an intellectual object, either a record or set of records or a publication, can consist of several digital components and vice versa, as discussed above, this area needs to be enhanced.

In order to accommodate the identified complexity it is necessary to distinguish at least between the following categories of relationships:

- relationships between intellectual objects: for instance, components of one collection or, in the case of records, the components of a case file or an (archival) fonds or a series (representing different aggregation levels) and their position within that aggregation. In the archival context this is referred to as 'documentary context';
- relationships between the (structural) components of one intellectual object, e.g. the pages of a book, the elements of a record, the components of a

multimedia document;
- relationships between digital components, e.g. those components that contain elements of one (or more) intellectual object(s); although this will implicitly include relationships between the digital components and the intellectual object of which they contain parts, this relationship should be described explicitly.

The first two categories will be fixed relationships, because they are inherent in the nature of the intellectual object (and can be considered as an example of significant properties). The relationships of the latter category will change over time, because technology will evolve and as a consequence the digital components will change.

Retention

An interesting issue for archivists is 'Archival Retention'. Unfortunately it is only touched upon rather superficially (p.42) within the area of the Ingest Process and it seems to refer not specifically to (archival) records, but to all kinds of objects. Confusing terminology again. Although one may look at a repository based on the OAIS model as one that contains information objects that should be preserved forever, one may also consider the possibility of applying the model to more dynamic environments, such as record-creating organisations. In this case, the issue of appraisal and disposition of records has to be included. In this context the recently published records management standard (ISO 15489) may serve as a useful framework. It would make the OAIS model even more widely applicable.

Finally

Summarising the above comments, I think the proposed set of preservation metadata provides an important building block in the search for preservation strategies. It is a first attempt to elaborate on the OAIS information model by synthesising existing results of different digital preservation projects in this area. There are some issues, however, which need further attention. They concern on the one hand the scope and underlying concepts of the OAIS model and the resulting metadata set as presented, and on the other hand the application of the model and metadata set in a records and archival environment. One issue is the scope of the metadata set, as it covers only metadata for information packages. It does not deal with other important areas of the OAIS Information Model such as Preservation Planning and Administration. It would be useful for a fuller understanding of preservation metadata, if this could be included in a subsequent version.

The metadata set (and underlying model) would also benefit from a clearer understanding of the concept of authenticity and the way it is included. In this respect more discussion is needed on the (underlying) concepts, not only on how authenticity is seen and should be positioned, but also on what is meant by a 'digital object'. In particular, the distinction between physical and conceptual or intellectual aspects of a digital object should be made more explicit and will probably have an impact on the model and metadata set also.

More attention also needs to be given to the relationship between the (preservation) processes and the metadata. This will help to clarify the purpose(s) for which metadata are necessary. In the case of this report, however, it is not clear how this is established or identified or, put otherwise, in what (preservation) processes what metadata are used.

Such information would help not only to understand the metadata set better, but also to support a more effective use both of the OAIS model and the accompanying metadata model for preserving digital material.

Another point is the fact that the Working Group has taken the OAIS conceptual information model as the basis for its work. Since that model is a high-level object-oriented model derived from the functionality of the OAIS model itself, the Working Group by definition had to stay on a high level also in order to establish a set of preservation metadata. It therefore has to be adapted and made specific to identified environments in order to be applicable. Nonetheless, the proposed preservation metadata set seems to be more suitable for the library community than for other communities. In this article I have tried to articulate some of the main requirements for the records and archival community in preserving (archival) records. Based on this, the conclusion has to be that some adaptations to the model and metadata set would be necessary to meet these requirements. This concerns requirements such as the concept of authenticity of records, information on the business context of records and on relationships between records ('documentary context'). In assessing the needs of the records and archival community, the ISO records management standard 15489 may serve as a very useful framework. Such an exercise would also include a test for applicability of the model and metadata set for record-creating organisations and, as such, broaden the view of the OAIS model. In a records environment, preservation already starts at the design stage and requires comprehensive lifecycle management, not limited to an archival institution, but including all stages of the records lifecycle. This again supports the proposal to have a metadata set for the full OAIS model that will include its management aspects.

'CREATIVITY IN TECHNOLOGY R&D': THE PISTOIA, TUSCANY WORKSHOP - RAPPORTEUR'S REPORT

BY JAMES HEMSLEY, NATIONAL MUSEUMS OF SCOTLAND & VASARI

Introduction

The PISTOIA Workshop (23 & 24 March 2002) represented an innovative approach by the European Commission to obtaining inputs on key issues for the Sixth Framework Programme regarding the role of the 'creative communities' such as: 'to discuss the state of the art and future trends in the field of information technology for culture, in particular contributing to the next Sixth Framework Programme, but also the role of contemporary art and culture in technology research.'

The approach was to bring together experts from across Europe from a diverse set of constituencies which included new arts, design, dance and music as well as from computer science, physics, mathematics, sociology, journalism, e-business and administration - some of whom were 'bi-cultural', i.e. from different spheres. A deliberate effort was made by the EC to ensure that the selection would force new connections with both pan-European and international perspectives. It followed a previous workshop at Darmstadt (May 2001) on Technology Platforms for Contemporary Art and Culture.

The intention was not simply to establish 'the next step' or 'to come to a collective, agreed or democratic conclusion' but rather to enable many different viewpoints to be seen and heard and to interact in an open-ended manner. The venue combined the indoors and outdoors in a private house and gardens (many thanks to the Gori family), both with superb art collections, in order to enhance the group's creativity on the subject of Creativity in Technology R&D in a Tuscan setting, the Fattoria di Celle. The modus operandi involved mainly small group working sessions, beginning with a plenary session of participants' personal 'visions' on the central issue posed by the EC. The costs were generously supported by the Pistoia Savings Banks, and organisational help was provided by the University of Florence (EVA Networking - EVAN project). Bernard Smith of the European Commission led the Workshop.

Key inspirational elements included:

The Leonardo example of bringing together the best of the arts and science worlds to increase creativity.

First-class editorial content as a vital element for creative technological solutions in practice - bringing the two worlds of the 'Creative Communities' and Technology R&D together can achieve greater success.

Highlights

Personal visions as starting-point inputs ranged from the pragmatic to the general including:

- Cooperation using 'creatives' and 'enhanced publications' [international and multilingual] and international games for children contributing 'local unique objects' and thus learning.
- Defining technological requirements in 'creative communities'.
- 'Develop multilinguality, usability and personalisation - with key criteria including authenticity, understanding and co-contextualisation'.
- 'More dialogue with users to increase social inclusion and access' – to promote learning, including in a fun way.
- 'We are in the Human Comedy - we have to have more fun, creativity and communication and to live in peace'.
- 'Emotion is a subject for creative technology.

'Strengths and weaknesses' discussions revealed some 'double-edged swords'

Strengths

- World-class creative communities [including art, music, design, film, TV, theatre and advertising, etc.].
- Cultural and linguistic richness, diversity and closeness (including tradition), 'creative conflict'.
- Strong technological capabilities, e.g. in industrial laboratories and universities.
- World-leading Museums (& Galleries), Archives & Libraries seen not only as memory institutions (cemeteries/burial grounds) but as sources of artistic and scientific creativity today and tomorrow.
- Excellent links with other continents.

Weaknesses

- Multilingual, multicultural difficulties in co-operation - no common language [NB General opposition to a unilingual approach].
- Most insidiously (even in the same language) differing 'discourse language' between the different communities, e.g. Arts, EC, Science & Heritage etc.
- Difficulties in facilitating best/good/interesting technology transfer in creative/cultural technology across Europe (some successes, e.g. Digital Library Guidelines).
- No adequate pan-European (EU) structure to bring the many existing (creative communities and technology) networks together.
- Very small size of almost all arts-oriented organisations and relatively (compared with Hollywood) weak film and TV industries.

Opportunities

- To create more jobs including those in conjunction with overlapping/related areas, e.g. education, entertainment, media and tourism, by raising the creative communities' roles in EC Culture & Technology R&D.
- To help create 'critical mass' on a global scale in the European communities and industries, but avoid threat.
- Use of touring arts exhibitions to help in cross-border technology transfer.

Threats

- A single, bland European (Euro-American) creative community and culture.
- Continued alienation of many of the ~80% of citizens who do not visit cultural institutions - especially ethnic minorities, other disadvantaged groups and children.
- Continued fragmentation of the European cultural communities and industries by a 'do nothing' or 'too little' approach.

Some Future Steps

Divided into small working groups, the participants developed a number of suggestions although no attempt was made to force consensus or majority voting for a future course of action. However, it seems useful to note some of the ideas which emerged during the discussions:

- Provide and disseminate actively information on available tools so that they 'are not just available to those in the know' as well as 'good/best/interesting' practice (with more help from Member States) and the EC projects themselves.
- Establish key jobs as 'Creative Arts & Technology Evangelists' in the EC, as has already been successfully done by the Cultural Heritage Unit with a museum person on a temporary contract. The suggestion could also be applicable to Member State administrations and would help in the 'discourse language' problem.
- Co-operate with national arts organisations so that they can participate in project evaluation processes and 'pair' with technology expertise.
- Increase access to the creative arts by technological means as appropriate [NB Relationships with 'technology push', e.g. Darmstadt Conclusions, the Florence Agenda, Glasgow Response & Berlin Conclusions in 2001].
- Encourage and assist 'memory institutions' to become sources/stimulators of creativity, not just 'cemeteries and temples'. 'Cultural heritage and legacy is not just a matter of bringing the past into the present and future, but cultivating creative activity in the present, illuminated by the past and with an eye toward the future'.
- Bring together creative institutions (to reduce self-referential tendencies) and also interested technology sources.
- Address the audience issues, e.g. who is the 'citizen artist' and 'citizen curator'.
- Focus on the younger generation and also intergenerational co-operation to ensure that the 'silver seniors' contribute and benefit.
- Most radical of the suggestions was that of initially pursuing a 'Doing Nothing Positively' strategy, i.e. a kind of 'creative non-action' by forming a vacuum or space , which would then doubtless be filled by a torrent of ideas and suggestions from a much wider set of people than the Pistoia group. This course of (non) action would be carried out in the remainder of 2002 using as 'creative spaces', for example:
- The RADICAL project 'MEDIATEQUE' in July.
- EVA 2002 London's Symposia on the Performing Arts, Film, Video & Broadcasting and New Technologies and Contemporary Art Documentation on the [re]Construction of Creativity.
- Diffusion by all the PISTOIA participants to their own 'networks' of the opportunities for creative ideas.

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Ideas Regarding Supporting Measures by the EC

The role of the creative arts needs to be better understood and contextualised. Two possibilities for immediate action were identified.

- Conduct a detailed survey of existing work (NB the existing idea of an 'Observatory' of the Creative Arts & Sciences).
- Carry out/commission 'cultural-socio-economic' impact analyses for technology R&D work involving 'creative communities'.

Post-script

The Sixth Framework Programme, especially in the areas of 'multimodal interfaces', 'networked audiovisual systems and home platforms', 'technology-enhanced learning and access to cultural heritage' and 'cross-media content for leisure and entertainment', appears to provide good opportunities for the 'Creative Communities' to participate.

Digital Resources for the Humanities 2002 - Conference Report

By Ian G. Anderson, Lecturer in New Technologies for the Humanities, HATII, University of Glasgow

Introduction

DRH2002 (8-11 September 2002), hosted by the University of Edinburgh, represented a distinct maturing of the humanities computing sector. This was evident by an emphasis amongst participants on users, standards and the wider implications that the use of technology has beyond the confines of an individual project.

The conference itself was reasonably well attended, with 183 delegates from 15 countries present. This is still down from the peak of 200-plus delegates several years ago but was a healthy attendance nevertheless. More conspicuous was the change in the nature of the delegates over previous years. Whilst there was still a good number of familiar faces, the proportion of younger and first-time attendees was noticeable. This is an extremely encouraging development and confirms the witespread interest and relevance that DRH continues to hold.

As ever, the conference appeals to a diverse audience, from a range of disciplines, projects, service providers and vendors. Not only does the conference need to cater to this diverse audience but sustain different levels of dialogue, from the novice to the expert. It is to the credit of the programme committees that DRH continues to achieve this.

Themes

Three strong themes emerged from the papers at DRH 2002:

- The importance of users and user evaluation.
- Emphasis on the use and application of standards.
- Addressing wider issues from the experience of individual projects.

Details of individual papers are beyond the scope of this report. However comprehensive abstracts of all papers referred to in this report can be found at: http://www.drh2002.lib.ed.ac.uk/

Users

One of the most welcome developments was evidence that user consultation and evaluation are playing an increasing part in the development and provision of digital and electronic resources. It has been well recognised that system design should be built around user needs and not vice versa. However, user consultation and evaluation has been conspicuos by its absence in project development or too often has been paid lip service. Tyacke made reference to the value of user consultation in her opening keynote addresses, and user evaluation was the subject of Anderson's paper on historians' information-seeking behaviour. There was also evidence of user consultation becoming embedded in project development. The paper by Yeo, Hockey and Sexton on integrating TEI and EAD for user access to archives was an excellent example of this.

Standards

Papers on standards such as TEI and EAD have long been a feature of DRH conferences. What was evident this year was the number of papers that sought to explain and analyse the application of such standards rather than describe the standards themselves. Of general significance was the wealth of projects in all sectors implementing some form of XML. On the evidence of DRH 2002, the prophecy that XML would become the information format of choice, particularly over SGML, is coming true, there remain significant issues of front end delivery of XML material but as more software becomes XML compliant we can look forward to significant developments in the near future. Some of the highlights under this theme were papers by:

- Barker and Corti on using TEI and DDI to access qualitative data;
- Bia, Vélez, Sanchez-Quero and Garcia demonstrated the use of TEI-compliant XML DTD and XSLT for manuscript description and interchangeability (e.g. automatic generation of descriptions from MARC records);
- Burnard considered the extent to which the revised XML-compliant TEI guidelines could be used for authoring new material, particularly Web pages;
- Efron, Fenton and Jones on the use of LSM-style metadata, Dublin Core, OAI and Universal Decimal Code in enhancing access to digital libraries;
- Walsh on accessibility to XML-based resources and using XSL to transform XML texts into a variety of output formats such as HTML, PDF, eBook, Vector Graphics and VRML amongst others;
- Yeo, Hockey and Sexton on a generic toolset to integrate TEI and EAD.

Projects

Past humanities computing conferences (and DRH is not alone in this) have tended to have a large proportion of papers describing small scale projects with limited technical applications. From an advanced or expert user's perspective these projects can seem at best mundane and at worst irrelevant. However, such projects often provide a useful entry point for those new to the discipline and disorientated by the barrage of acronyms and technical jargon. They represent simple, real-world examples of what can be done with digital or electronic technology. One of the trends evident at DRH 2002 was that, although there were a range of small project based papers, by and

large they avoided simply being descriptive, addressed broader issues of applicability, and yet remained accessible for the novice delegate. This is another sign of the growing maturity, understanding and interdisciplinary nature that has developed in the community. There appears to be a critical mass of users who have learnt from the mistakes of the past and are applying technology in relevant, innovative and transferable ways.

Of note under this theme were Osborne, Anderson and Gerencser on the production of digital resources through co-operation between educators and archivists. Spaeth's paper on the application and analysis of probate records using XML as a textbase alternative to relational databases was a highlight in this regard. In a similar vein Lunberg explored the integration of the Master XML DTD with a Z39.50-compliant database and the delivery of search results in MARC format.

Summary

There were many more valuable and challenging papers presented at DRH 2002 than can be reported here. However, the three themes outlined above continually recurred in papers, panels and keynote sessions. Finally this report can not conclude without mentioning the closing keynote address by Ted Nelson. Provocative, challenging, engaging, humorous and insightful are just some of the adjectives that describe his speech on how humanists can fight back against the tyranny and restrictions of the hierarchical hypertext system.

It well reflected the critical, forward looking and confident community of DRH 2002.

Electronic Publishing for Cultural Heritage Studies

European Summer School, Sofia, Bulgaria, 9-29 September 2002

By Milena Dobreva, Associate Professor, Academic Director of the School

The pace of modern development and globalisation increases the difficulties faced by communities and governments as they work to preserve their cultural heritage. Providing access and visibility to the rich diversity of Europe's cultural heritage is essential to ensuring that cultural differences and similarities play a key role in the integration processes.

New information technologies offer a wide range of means and devices for providing access to, and contributing to, the preservation of cultural heritage. Although, in recent decades, the importance of cultural identification and online access to heritage resources has been in the limelight all over Europe, in Central and Eastern Europe (CEE) electronic publication remains a challenge for those involved in the management and preservation of cultural resources. Specialists in Central and Eastern Europe only have *ad hoc* opportunities to gain support for projects to develop electronic resources and subsequently are confronted by many technical difficulties and shortages of skills.

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The concerns of curators in Central and Eastern European countries can be summarised in the following five issues:

- The lack of sufficient funds to maintain conservation and preservation programmes in their institutions. As a result, digitisation and digital preservation projects are a luxury that few institutions in CEE countries can afford.
- The necessity to develop skills and standards to present local written sources adequately in an environment where skills development opportunities are available.
- The lack of local reference model inter-

pretations for standards. Materials in CEE countries pose special problems and require that standards be placed in more local contexts.

- The difficulty of presenting local cultural heritage to a wide audience. In the past the local material used to be chiefly of interest to specialists. The possibility of presenting local material online potentially enables us to reach new audiences. This requires including proper explanatory materials so that the interest of this expanded and diverse audience can be satisfied.
- The necessity to involve specialised professionals in such endeavours and to train library staff who have little specialised skill.

The European Summer School on 'Electronic Publications for Cultural Heritage Studies', held at the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, brought together 35 young professionals working in cultural heritage institutions and universities in Armenia, Bulgaria, Georgia, Lithuania, Poland, Romania, Russia, Turkey, Ukraine, the United Kingdom, and former Yugoslavia. Participants enriched their knowledge about the application of new information technologies in the presentation of cultural heritage. The High Level Scientific Conference programme of the European Commission and the Agency for Development of Information and Communication Technologies under the Ministry of Transport of Bulgaria provided the funding to make the Summer School possible.

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The Summer School was based on a series of modules delivered by lecturers from Bulgaria, Denmark, Greece, Ireland, the United Kingdom, and the United States. The scope of the School covered the general basics of the management of online cultural information and shed light on the question of handling local and culturally specific materials for their adequate presentation. As a result, it provided not only the state-of-the-art of Western practice, but also the required reference to help understand region-specific challenges and strategies and approaches to meeting them.

Modules included:

- an introductory module that outlined the basic framework for the selection, creation, representation, management and presentation of cultural heritage information online (Seamus Ross and Mike Black, Glasgow);
- computer encoding and transcription of manuscript texts, based on the experience of the EC-funded MASTER project and the Netværk til elektronisk behandling af nordiske middelalder-håndskrifter (Matthew Driscoll, Copenhagen);
- building corpora (Lou Burnard, Oxford);
- methods and techniques for the digital representation of cultural heritage (Michael Mac an Airchinnigh, Dublin);
- methods for building Internet portals for cultural heritage (Konstantinos Chandrinos, Athens);
- issues associated with localisation, stan darisation and non-Latin alphabets addressed by a number of lecturers including Michael Everson (Dublin), Ivan Derzhanski (Sofia), and David Birnbaum (Pittsburgh).

Participants also gave presentations on their own projects, which displayed the rich array of activities currently under way in CEE countries and increased the sense of urgency for access to skills development such as this.

The lectures, seminars and practical sessions were enriched by visits to two manuscript repositories. Professor Trendafil Krastanov introduced students to the Church Archives (Sofia) and to the issues that would be raised in their digitisation. Dr Elisaveta Mousakova, Head of the Manuscript Department of the National Library 'St Cyril and St Methodius', and her colleague, Elena Uzunova, offered course participants the opportunity to examine the mediaeval manuscripts in their care.

Earlier courses have not only improved the skills of heritage professionals in CEE countries, but have also created an environment that leads the participants to collaborate on joint projects. Past courses provided an environment to foster the co-operation of specialists from Lithuania, USA, Italy and Armenia. Collaboration of this kind should be encouraged in the CEE region. Together with proper training and education of scholars, opportunities are created for the unique 'voices' of the different cultures from this part of Europe to make themselves heard online in the global information space and to enable us to illustrate the rich cultural heritage of the region.

We hope that the School contributed to the cause and will boost future activities and also that funding for more skills and knowledge development courses of this kind will be possible.

Those who would like to find out more about this Summer School are invited to visit:
http://www.math.bas.bg/~epch/program.htm

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