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EDITORIAL

The Challenge of the Acquisition of the Bettmann Archive by Corbis

During the International Conference on Hypermedia and Interactivity in Museums, the news that Corbis had purchased the Bettmann Archive was announced. If it was to happen, I think the announcement could not have come at a better time; most of the people in the world who were thinking about how to make the collections of their archives and museums available digitally were gathered in San Diego. Here they learned together of the challenge that the private sector will pose for cultural institutions.

The Bettmann Archive is an almost legendary collection of over 17 million historical, contemporary, and news images from the past fifty years of photography and one of the major image licensing entities in the world. The partnership with Corbis will presumably enable Corbis to provide digital versions of the Bettmann holdings to an expanded and more popular community of clients worldwide.

The ease with which users might be able to obtain images of virtually anything imaginable within the Bettman collection forces the non-profit cultural sector -- libraries, archives and museums -- to think carefully about whether and how they can position themselves to earn income from their digitized holdings, or reach popular audiences with what they (rightly) consider to be more interesting and important images and a higher quality of data. As I expressed this in a talk in London¹ earlier this year, we need to recognize the extent to which museum data is fungible and define standards that we will then collectively follow to ensure that our data is indeed better than that which is sold by the private sector.

¹ *Proceedings of the Conference on Museums and the Internet Spectra* (Summer 1995): 18-24.

The Getty AHIP Imaging Initiative: A Status Report

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Introduction

As the success of the EVA conferences has shown, digital imaging has captured the imagination of the cultural heritage community. We have seen dramatic developments in image and multi-media data capture, storage, communication, and delivery. Applications which seemed impossible, or visionary only a year ago are now commonplace. The World Wide Web has brought networked multi-media to the desktop and the home. A burgeoning CD-ROM publishing market has seen a steady growth in art and museum related titles. The fact that several were reviewed in a recent issue of *Scientific American*¹ shows their move into the mainstream. Computer-based kiosks and interpretive tools have become a common part of interpretive programs in museums and galleries. What museum does not have sort of imaging project, in prototype or development?

These changes have provided opportunities and posed challenges for the institutions and individuals responsible for the creation of multi-media applications and the development of institutional databases which support them. Possibilities have created new demands. What was once a simple text-based collections documentation system has grown into a multi-media archive, as image, text, sound, and moving image are

merged into a seamless web of documentation about our cultural heritage. The development and management of these archives has become a significant challenge, requiring an institutional investment in staffing infrastructure and a commitment to a future which sees the virtual museum as a crucial part of the traditional museum's activities. But where are the guidelines in this new area? The "problem-set" in relation to digital imaging can seem insurmountable at times. Change seems to be the only constant, and technological advances threaten to overwhelm us. Developing "standards" in such a landscape may seem a futile exercise, for the time it takes to reach consensus almost guarantees obsolescence. But without some common agenda, we risk the creation of disparate and incompatible systems which are not positioned to take advantage of the full potential of developing network communications technologies.

The Getty AHIP Imaging Initiative

The Getty AHIP Imaging Initiative was launched in the spring of 1994, with a mission to act as a catalyst in the development of the guidelines and standards which would enable the development and network communication of digital image archives. Shared standards and common approaches are essential for the creation of resources to function in the virtual world.

Standards enable us to share information effectively and efficiently, without fear of data loss or misinterpretation. Guidelines provide common approaches to problems and help to avoid the syndrome of "reinventing the wheel." They enable collaboration and cooperation through the development of consistent approaches to shared problems. In March of 1994 a group of leaders involved in the construction and management of digital library and museum collections and their distribution over communications networks was asked to define the particular challenges imaging posed for the cultural heritage community as a whole. They were challenged to identify the major barriers to universal and comprehensive access to images and information in art. Consensus clustered around the following areas: standards, intellectual property and education.²

1 Ben Davis, "The Gallery and the Machine," *Scientific American* (May 1995).

Standards are essential in order to ensure inter-operability between systems and interchangeability of data. An appropriate framework for the administration of intellectual property is a precondition for the ongoing distribution of information and the maturing of the information economy. General education about the potential of digital imaging, including the development of guidelines and best practices, is necessary for the community to move ahead as a whole. Each area raises fundamental questions regarding the creation of a critical mass of digital image and information documenting our cultural heritage.

This framework formed the foundation for the three-year work plan of the Getty AHIP Imaging Initiative, the first year of which has just been completed. Our activities to date have focused primarily in the areas of intellectual property and education. We have also begun to address the more complex issue of standards. What follows is an overview of our activities in these three areas, which includes a profile of plans for the coming year.

I. Intellectual Property

Few issues have impeded the creative development of interactive multi-media applications to the same extent as intellectual property. Just the image of an endless round of letters each asking for the permission to reproduce a particular work has kept many projects on the drawing board. Alternatively, projects have gone ahead, operating in gray areas of ill-defined copyright law, or working, in the United States, under a broad interpretation of the doctrine of "fair use." Neither of these strategies is satisfactory, from either the perspective of the information user or the information provider. Without a common framework of rights, permissions, and restrictions, the development of imaging systems is hampered. Developing an appropriate intellectual property framework will require a complex balancing of the interests of rights holders and the desires of those who use images for teaching, research,

2 A detailed report of the discussions at this meeting, entitled "Initiative on Electronic Imaging & Information Standards, Meeting Report, March 3-4, 1994" is available from the Getty Art History Information Program.

or enjoyment. Progress in this arena has been slow, particularly internationally, as differences in national law have stood in the way of collaboration. One positive sign, on the national level in the United States, is the production of the *Sample CD-ROM Licensing Agreements for Museums* by the MUSE Multi-Media Study Group.³

Designed to reflect the "views and opinions of museum professionals," these sample texts with a helpful gloss offer a starting point for museums faced with negotiating the use of digital images of works from their collections in published, commercial, fixed-media titles. This is a significant first step forward, addressing one of the major ways by which digital images of works in museum collections are now distributed. It reinforces the position that contracts reflect a negotiated position and asserts the rights that the cultural heritage community may wish to protect. The networked distribution of digital images requires the development and implementation of new paradigms for intellectual property management. Just as our concepts of geography and "site" are being challenged by a global network that knows no boundaries, so too are our conceptions of "original" and "copy" dissolving into infinitely replicable reality. Our old models of property translate with great difficulty into network space; we need to look for new ways to manage and license the distribution of information.⁴

Museum Educational Site Licensing Project (MESL)

The Museum Educational Site Licensing (MESL) Project offers just such an opportunity to explore new means of information distribution. This two-year collaboration brings representative museums, colleges, and universities together to define the terms and conditions for educational use of museum images and information on campus-wide networks. Launched by the AHIP Imaging Initiative, in association with MUSE Educational Media, MESL will develop methods and guidelines

3 Muse Educational Media, *Sample CD-ROM Licensing Agreements for Museums* (1995). Available from Muse Educational Media, 1 East 53rd Street, 10th floor, New York, NY 10022-4201.

4 See, for example, Ester Dyson, "Intellectual Value," *Wired* (July 1995): 137-141, 182-4.

for the educational use of digitized museum materials. A small number of selected educational institutions and museums will collaborate in good faith to define terms of image capture and distribution and to develop guidelines for the use of images and textual documentation from museum collections. Our goal is to develop and test administrative, technical, and legal mechanisms that will enable the delivery of large quantities of high-quality images from any museum to any educational institution.⁵

The Need for the Project

The Museum Educational Site Licensing Project grew out of a sense of shared need and mutual benefit. Both the educational and the museum communities have much to gain from defining a collaboration which explores the potential of networked communications technology for distributing digital images and information. Within the educational community, demand for access to digital content is increasing rapidly. Campuses are wired internally -- often right to the dorm room -- and connected externally. Instructional technology departments are making more and more creative use of computer technology for educational purposes, but often lack the rights to use core materials. In some schools, digitization projects have been undertaken without a clear understanding of the rights issues involved. In others, projects are on hold pending some hoped-for resolution.

As Tom Hickerson, director of the division of rare and manuscript collections at the Cornell University Library and a project site coordinator, said "One of the main reasons we don't have online classrooms in the humanities and the arts like we do in the sciences and engineering is simply the lack of information available in digital form." However, much research is still needed to understand how best to integrate digital information into the teaching process. "We aren't going

5 Background information on the Museum Educational Site Licensing Project is available by ftp from the Getty Art History Information Program: ftp to ftp.ahip.getty.edu/pub/mesl, log in as "anonymous" with your email address as the password. A profile of the project can be found in the publication of the Museum Computer Network: J. Trant, "The Museum Educational Site Licensing Project," *Spectra* (Spring 1995).

to see the resources devoted to developing large databases of material until we can demonstrate their value. The Museum Educational Site Licensing Project will push us toward those practical uses." Within the museum community there is a strong awareness of the potential of imaging technology to make collections available. This is paired, however, with a fear of losing control of the images of the collection if they are released in digital form. Digital images are easily duplicated and altered. They quickly become disassociated from the information they were distributed with. What standards are needed to ensure that images are accurately described? What security measures can be put in place to prevent images from being altered or further distributed. How can the integrity of the digital record be preserved? MESL provides a controlled environment within which to examine these questions.

Museum rights and reproductions departments are daily faced with requests to use images of the collection in digital form and are often unsure how to respond. What fees should be charged for what uses? What restrictions should be placed on use? And what will fund this new activity in a time of economic restraint? Simply processing requests for the electronic rights to use works represents a major investment in time and effort. New models must be developed to enable the efficient management of intellectual property rights.

Why Site Licenses?

Many models have been proposed to manage intellectual property on the information highway. The majority of these have focused on the development of metering systems that operate on a "pay per bit" model. For several reasons, this model does not translate well into the educational or museum community. Monitoring at this level of detail requires an investment in infrastructure and a commitment of systems resources which may be beyond the capability of many institutions. Charging for the use of information itself seems antithetical to intellectual exploration and learning. Who would be most penalized by limits on access? Both the student struggling to come to terms with the subject and the scholar striving to develop an in-depth understanding of a particular area of research would generate disproportionately high charges. And who would be responsible for paying them? The individuals themselves? The department? The institution? Would each

user have a particular allowance? How would such an allocation be made? How can an institution budget for the acquisition electronic resources when there is neither set charges nor a ceiling on payments in place? How can finite resources be allocated when costs are unpredictable?

The site licensing model which will be tested by the MESL project addresses some of these concerns and reflects the following principles. Information should be free at its point of use; hidden usage charges should be avoided. (Charging specific access fees would be similar to charging individuals each time they check out library books from an institutional collection.) Costs for assembling collections of electronic resources should be borne as institutional expenditures. Passing fees on to individuals inhibits access to information. Costs need to be predictable - libraries must be able to budget for the acquisition or use of electronic resources - and be reasonable - based on the costs of generating the resource. It should be possible to project costs accurately. Fees should be structured so that the widest possible use of resources is encouraged. Monitoring and security requirements should be reasonable.

The site-license model offers a means of satisfying these concerns. Through an annual subscription fee, an educational institution could gain access to a wide body of quality electronic information about many museum collections. This virtual archive (or selections from it) could be distributed on a campus network and made available to the full campus community. No specific charges would be incurred by the users of the information. Security requirements would be similar to those of maintaining the campus network as a whole, and would not require monitoring at the individual access level. Site licenses could be administered by a not-for-profit entity which acts as an intermediary between museums and educational institutions. A shared administrative framework would ease both the costs of distribution and the administration of rights. A common agreement would remove the institutional burden of negotiating licensing on an item-by-item basis - a very labor intensive proposition. The licensing of material would provide a constant stream of revenue for the museum community which could be used to add to the available stock of digital images. Educational institutions would have access to a predictable supply of quality images and information about works in museum collections and would also have

the opportunity to act as information providers, making works from special collections and archives available for distribution. A self-sustaining distribution system could be established, which operates for the benefit of both participating museums and educational institutions.

Project Methodology

The core of the Museum Educational Site Licensing Project is a structured test of the distribution and use of museum images and information on campus networks. During the 1995-96 and 1996-97 academic years, digitized images and documentation will be distributed among participating institutions. Technical means of image collection and distribution, and methods for ensuring the security of the digital archive, will be tested against requirements defined by the project participants. Representatives will meet regularly to evaluate progress and to develop the needed procedural and licensing framework.⁶

Project Participants

A competitive process was initiated in the fall of 1994 to select the participants in the Museum Educational Site Licensing Project. Over eighty institutions responded to a Call for Participation; from these proposals, the project management committee⁷, comprised of experts in the museum, digital imaging, and information networking fields, selected six museums and seven universities to participate in the first year of the project. The Library of Congress was subsequently invited to participate. The following institutions are participating in the Museum Educational Site Licensing Project:

6 Two full participants' meetings have taken place to date. Reports are available on the AHIP ftp site.

7 The MESL Management Committee is comprised of: Maxwell Anderson, Director, Art Gallery of Ontario, and Chair of the Information Technology Committee of the Association of Art Museum Directors; David Bearman, President, Archives and Museums Informatics; Howard Besser, Visiting Professor, University of Michigan; and Clifford Lynch, Office of the President, University of California. The Project Executive is Jennifer Trant, Manager Imaging Initiative, Getty Art History Information Program. Patti McClung works with MESL as an independent consultant.

Museums

- The Fowler Museum of Cultural History at the University of California, Los Angeles
- The International Museum of Photography at George Eastman House, Rochester
- The Harvard University Art Museums, Cambridge
- The Library of Congress, Washington, D.C.
- The Museum of Fine Arts, Houston
- The National Gallery of Art, Washington, D.C.
- The National Museum of American Art, Washington, D.C.

Universities

- American University, Washington, D.C.
- Columbia University, New York
- Cornell University, Ithaca
- University of Illinois at Urbana-Champaign
- The University of Maryland at College Park
- The University of Michigan at Ann Arbor, Dearborn, and Flint
- The University of Virginia, Charlottesville

Each participating institution has formed an inter-disciplinary project team. Team members are drawn from a broad range of professional specializations, from art history to network architecture, digital image capture to intellectual property law. These team members are collaborating in a series of working groups which are formed around specific tasks. The current working groups are: Content Selection; Evaluation; Base Measurement; WWW/Communications, Documentation, and Distribution; and Security and Monitoring. In all approximately 150 professionals from across the United States are collaborating on various aspects of the project.

Each participating museum has committed to making a minimum of 500 works of art available in each year of the study. These will be selected by the museums on the basis of criteria suggested by participating faculty who have been encouraged to propose a wide variety of educational and research uses for the materials. The images

and data will be used by the participating educational institutions in at least one course in each academic year and made available on each campus network. Throughout the project, faculty and student use will be monitored and evaluated by experts in educational technology, providing concrete comparative data about the use of digital images as an educational tool.

Project Goals

At the end of the two-year project, model site licensing agreements will be defined to govern the educational use of museum images and information on university and college campuses. Procedures for the collection and dissemination of museum images and information will have been developed and tested and the framework for a broadly based system for the distribution of museum images and information to the academic community will be in place.

In addition, evaluative reports will document the procedures employed in the project. User studies will assess the ways and means by which the images and information were used and will provide a wealth of information regarding searching strategies, image quality needs, user tolerance levels, and the adequacy of image description standards and access vocabularies. Comparative technical data, gathered from each site, will enable an evaluation of the effectiveness of specific architectures and system topologies. In short, we have an opportunity to assess the educational impact of the availability of a significant body of primary visual information and design a new way of distributing information from museums to universities.

Creating this new set of relationships will require a re-examination of the role of information provider and information consumer. Key in this reengineering exercise is an economic study of digital museum and library operations. Little is known about the real costs of the ongoing distribution of images and information over networks. Within MESL we have an exceptional opportunity to build our knowledge of the issues involved in delivering large electronic data sets in different technical and administrative environments. This will enable us to develop and test economic models with the hope of creating a more general framework - a self-sustaining mechanism that will enable the educational use of

material from any museum by any educational institution. In order for this model to count as a success, however, we must develop a solution that will work in numerous national jurisdictions. The MESL Project is willing to share its expertise with any organizations who might wish to mirror the model in their own countries,⁸ and we look forward to the possibility of international collaboration.⁸

II. Education

It is easy to forget, as we embrace advancements in imaging technology, that this is an arcane and elitist world, still inhabited by a few who speak their own language and often communicate in code. Demystifying the world of digital imaging was our goal in the production and publication of an *Introduction to Imaging: Issues in the Construction of an Image Database*.⁹ This booklet introduces the technology and vocabulary of digital imaging as they relate to the development of image databases depicting works found in museum collections. It illustrates the choices that must be made when images are captured, and outlines the areas in which institutional strategies regarding the use of imaging technologies must be developed. It does not offer the answer to the question, "Which image database software should I use?," for such a reply is as elusive as the Holy Grail. What it does provide is an outline which will enable those in management to appreciate the potential of digital imaging. It also provides those in the initial planning stages of an imaging project an overview of the issues they will face and a means to structure their research. Throughout the text, a strong emphasis was placed on identifying the core of a research agenda, listing other resources where information can be found, and developing a detailed glossary and bibliography. We have also made the text of the *Introduction to Imaging* available on the World Wide Web

8 Further information about the Museum Educational Site Licensing Project can be found through the Getty Art History Information Program's World Wide Web site (<http://www.ahip.getty.edu/home.html>).

9 Howard Besser and Jennifer Trant, *Introduction to Imaging: Issues in Constructing an Image Database* (Getty Art History Information Program, 1995).

(http://www.ahip.getty.edu/intro_imaging/home.html). This transformation of a published document into a resource site required a rethinking of the structure and sequence of the materials presented. Issues arose in a number of areas relating to the nature of the *Introduction to Imaging* and the content that it communicates; to the design and implementation of an AHIP presence on the WWW; and to questions of the nature and direction of developments in the WWW itself. We also had to struggle with the limited typographic capabilities of HTML. Without any control over the final delivery platform, design becomes an exercise in balancing communications goals within the restrictions of communications networks.

As the hypermedia document took shape, preliminary strategies for addressing issues in structure and delivery of content were adopted. The construction and production of the WWW version of the *Introduction to Imaging* became a practicum for the subject matter it introduced -- it is a network-accessible document, incorporating images, about making digital images accessible over networks. As such, it provided an opportunity to use the medium to communicate aspects of the message -- for example, to demonstrate the implications of file size on network transmission rather than to describe them. This self-reflective nature added an additional dimension to the design and implementation of the site. We will be maintaining the online version of the *Introduction to Imaging* and welcome comments and suggestions about how it may be enhanced and improved. Please use the online comment tool to send us your thoughts.

Project Management Case Studies

In the next year we plan to build on the framework offered by the *Introduction to Imaging* by developing a series of project management case studies. Our goals in this area are tripartite:

- (1) to build knowledge of the implications of particular project management strategies in the development of imaging systems;
- (2) to identify critical moments in the project development life cycle of imaging systems when choices are made which influence the future direction of the project; and

- (3) to assess the effectiveness of certain technologies within defined circumstances.

This planned study of imaging project management will highlight the "best practices" in the management of imaging systems. It will outline the phases in the development of an imaging system - from requirements analysis, through technology choice, to implementation and assessment. Each project will be profiled in a similar manner, in order to allow for comparisons. Particular attention will be paid to the requirements analysis phase and to the development of a framework to assess the "fit" between imaging requirements and technologies. As we are still in the process of finalizing the projects to be used as case studies, we would welcome suggestions for inclusion. A preliminary report on our progress in this area will form part of a pre-conference project management seminar that the Imaging Initiative is sponsoring at the International Conference on Hypermedia and Interactivity in Museums conference in San Diego this coming October.

III. Standards

Shared standards must be the foundation upon which the virtual museum is constructed.¹⁰ As the cultural heritage community develops multi-media archives which document our collections and takes advantage of telecommunications networks to share information with our various communities, we will rely on common standards to ensure that information maintains its meaning and its value as it moves across networks and among systems. Reusable digital archives documenting museum collections must be constructed around a framework of standards to safeguard their integrity and longevity.

No single "standard" will be sufficient. Multi-media applications include diverse data types, and take advantage of a range of system

10 The framework presented here draws on that presented by Costis Dallas, Director of the Foundation for the Hellenic World, at the meeting of the International Council of Museums, International Committee on Documentation, Stavanger, Norway, July 4, 1995.

capabilities. Each of these areas is governed by a particular standard or set of standards, either developed within the international standards community or within industry. Standards apply as information is captured, stored, displayed, and distributed. The challenge for the cultural heritage community is not to govern the development of technical standards, but to understand their appropriate use. We need to build our understanding of the suite of technical standards so that we can make choices that reflect our needs and so that we can focus our development efforts on areas of particular concern.

The Imaging Initiative has identified two specific areas where the cultural heritage community needs to participate in the development of standards: image documentation and image quality. If we wish to ensure that we will be able to use digital image files in the future, and accurately interpret the information they contain, we must construct them according to consistent guidelines and document their intellectual and technical characteristics. The Imaging Initiative has participated in discussions of image documentation requirements within the context of the Coalition for Networked Information and the Consortium for the Computer Interchange of Museum Information. In the fall of 1994, a preliminary framework was presented for comment which raised the following questions: What information should be recorded about digital image files? Where and how should image files be documented? What information must be placed in the image header, and what can be placed in an accompanying text record? How should that text record be fielded? How should the relationships between image files and their accompanying text records be managed?¹¹

A number of general kinds of information about a digital image were identified:

- (1) Information required to view the image, including type (bit-mapped, vector, video), format (such as TIFF, GIF, JFIF), compression scheme (such as JPEG, LZW, QuickTime) pixel dimensions and dynamic range, CLUT, and color metric (CMYK, RGB);

11 J. Trant and H. Besser, "Describing Image Files: The Need for a Technical Standard," Coalition for Networked Information, Fall Meeting, Orlando, Florida, November 30, 1994.

- (2) Information about the quality and accuracy of the image, including the source digitized, the source image type, source image identification and the institution responsible for creation of the digital image (this could be a series of recursive relationships when images are derived or scanned from other images);
- (3) Information about the scanning process, including light source (full spectrum, infrared), resolution, dynamic range, type of scanner (for color correction), date of scan, the identification of the scanning personnel, a record of image manipulation (cropping, color balancing), and the addition of digital signatures or other methods of authentication;
- (4) A description of how an original is depicted in a surrogate image, including mention of perspective, position, orientation, aspect, and linking between various views of the same original, or different versions of an image (browse, high-resolution, medium resolution) derived from the same scan;
- (5) A description of the work depicted according to a known content standard such as AACR2 or the AITF Categories for the Description of Works of Art;
- (6) Rights and reproduction information documenting the copyright of the original, the surrogate image, and the digital image, and including the name of the rights-holder and possible use restrictions (on viewing, printing, or reproduction);
- (7) Information about how to locate an authentic copy of the image recorded in a form such as a Universal Resource Name/Number or Universal Resource Locator.

This preliminary schema needs further examination and refinement. Each of the areas identified above needs additional definition and clarification. We need to understand which data should be carried along with image data, as part of an image file, and which should be stored separately. This must be done to satisfy two critical needs. As image files move around the network it is essential that they carry enough information with them to identify their contents. And as image archives

are constructed, it is essential that we record the circumstances of their creation so that we can evaluate their contents in the future.

Image quality standards are also essential if we are going to create digital image archives of lasting utility. While we have historically focused on capturing as much digital data as possible, we must develop realistic guidelines for acceptable quality which move beyond resolution and dynamic range as measures. If we wish to use digital surrogates for research and teaching, we must build our understanding of the functions for which the image is to be used. Only then will we be able to make sound judgments about appropriate amounts of information to be delivered under certain circumstances. Our assessments of image quality need to accommodate more complex concepts of color fidelity, the quality and photographic intermediary, and the characteristics of the original work depicted. A useful model here is *Digital Resolution Requirements for Replacing Text-Based Material: Methods for Benchmarking Image Quality*, recently published by the Commission on Preservation and Access.¹² We also hope that the work of the Museum Educational Site Licensing Project will enhance our knowledge of the use of digital images in classroom teaching, self-study, and research.

Conclusion

There is no shortage of issues to address in the area of digital imaging. For example, as Donna M. Romer outlines in her paper, "Research Topics In Image and Multimedia Retrieval," prepared for a discussion AHIP is hosting on the Research Agenda for Humanities computing, we have many further challenges in the integration of images into what is a primarily text-based world of information search and retrieval. Resolving these questions will require our collective efforts; the Imaging Initiative looks forward to future collaboration with those who share a common interest in their resolution.

12 Anne R. Kenney and Stephen Chapman, *Tutorial: Digital Resolution Requirements for Replacing Text-Based Material: Methods for Benchmarking Image Quality* (Commission on Preservation and Access, April 1995).

Communications networks should provide us with the greatest motivation for this collaboration. Not only do they enable professionals in disparate geographic locations to work together, but they provide the platform which makes the virtual museum a plausible reality. It is now possible to consider merging data and images from a number of networked sites into a resource which reflects the interests of a particular student or researcher. As more intelligent desk-top tools move the Web away from its current configuration as a set of "destinations" into a fully functioning virtual museum, where it is possible to retrieve representations of museum objects in conjunction with rich contextual data rather than simply viewing them in a predetermined manner, our collective vision of a distributed knowledge-base of our common cultural heritage comes into focus.

ARTICLE

Standards for Networked Cultural Heritage¹

David Bearman

Introduction

The last five years have seen a major paradigm shift in computing. While PC and mini-computer systems and networking have been with us for over fifteen years, the development of "client/server" architectures and the widespread adoption of the Internet have together made computer-based communications a reality. Although GUI's are older than the Macintosh computer and object oriented languages have been used for a decade, the movement to object oriented systems and architectures that assume object oriented API's is transforming the nature of computer-based data. These two developments together will soon lead to a new generation in distributed processing environments, characterized by the rise of "applets" which exploit the communications environment to deliver functionality for locally processed objects.

The enthusiasm with which cultural institutions have embraced the latest developments in computer based communications as reflected in their adoption of the World Wide Web, stands in great contrast to their conservatism and hesitancy in the face of computing over the past twenty

¹ This paper is the second of three prepared earlier this year to explore how the development of the Internet was impacting on strategies for cultural documentation. The first paper, "Museum Strategies for Success on the Internet" appeared in Proceedings of the Conference on Museums and the Internet, (London, Science Museum, 1995) and was also published in *Spectra*, vol.22#4 p.18-24. The third paper, "Information Strategies and Structures for Electronic Museums" was published in Information: The Hidden Resource, Museums and the Internet. Proceedings of the Seventh International Conference of the MDA, 1995 ed. by Anne Fahy and Dr. Wendy Sudbury (Cambridge,UK, Museum Documentation Association, 1995) p.5-22. I am grateful for the support of both the Getty Art History Information Program and the Canadian Heritage Information Network which funded aspects of the writing and revision of this paper.

years. While this enthusiasm is naive, seasoned computing professionals should be alerted that it reflects the importance to museums of public accessibility and of the visual image, neither of which was enabled by the past generation of systems which made few inroads. Obviously heritage information professionals should welcome the change of attitude, and especially the implicit recognition of the power of visual surrogates of primary materials. At the same time, we must be aware that the WWW will not contribute to enabling useful access to cultural heritage information without a clearer sense of which standards are critical to the provision of functional access in the near-term and to the preservation of content over the long-term. In this paper I will discuss the nature of the standards required for the international cultural heritage community to succeed in implementing computer-based communications and the role leading cultural heritage organizations could play in bringing their programs into line with these standards. I hope the argument will contribute to getting commitment from museum directors and their counterparts in other cultural institutions to standards-based information management strategies.

Over the next two decades we can expect to see a growing penetration of interactive, broadband services into homes, schools and businesses and the emergence of a facility for information and entertainment of an importance equal to that of television today.² Information services with this degree of market impact will only occur if the user is 'coddled' and 'assisted' and the information can be provided with a minimum of reprocessing to support a variety of "points-of-view". The coddled user expects his software to diagnose its environment, locate the elements it needs to run, update itself and automatically back up his activity. The assisted user will not read manuals or lists of headings, will use her own language in making inquiries and will expect relevant, weighted, and usefully formatted results that can easily be utilized with a range of available tools. Users will be almost unaware that information has been provided to support other points-of-view than their own because what they will see, as results of their searches, will employ language appropriate to their level of expertise and display it using metaphors with

2 For reflections on how this will impact cultural institutions, see David Bearman, editor, Hands On: Hypermedia and Interactivity in Museums, (Pittsburgh, Archives & Museum Informatics, 1995): 293pp. and Multimedia Computing in Museums, (Pittsburgh, Archives & Museum Informatics, 1995): 388pp.

which they are already comfortable, such as maps or timelines. Information suited to their point-of-view will have been compiled from sources, such as dictionaries of national biography, national bibliographies, historical atlases and the like which expand the contextual linking opportunities of the users own search.

Recent developments in computing could contribute towards enabling us to serve these users, but the objective of making our information systems work in these ways will have to be accompanied by reassessment of the kinds of standards we support and how we implement them. There is no question in my mind that if cultural heritage institutions are to succeed in the next century, they will need to provide easy, one stop electronic access to their collections and programs. For this reason, I have confidence that they will only succeed if they act collectively and if appropriate standards are developed and employed. Unfortunately, I'm equally convinced that the standards we have been promoting until recently are not appropriate for the strategies we need to enable.

I. Why Standards?

A standards based information management strategy should help individual museums acquire information less expensively and with greater functionality but its real pay-off is for the cultural heritage community as a whole. There is promises to make our information collectively useful, enabling us to become 'players in the emerging consumer communications environment. The benefits of such a strategy, however, will only be realized if the strategy can capitalize on three sources of potential value:

- it must reduce the cost of capturing digital representations of the collections, in text, image and sound or multimedia; and it must make possible capturing existing source materials and making new source materials in equally cost effective ways,
- it must support the functionality required for public access to meaningful information about cultural heritage while at the same time enabling museum applications, and
- it must substantially increase the size of the audiences we can reach both by enabling us to reach a broader audience, satisfy

special requirements of narrower audiences, and tailor content to previously unreachable audiences.

In each case, adopting the right standards can play a significant role in reducing risks, increasing benefits and reducing costs, but in each case also the speed at which the technology is changing makes any decision complicated. Not deciding, of course, is making a decision too. Therefore consciously addressing the implications of specific technical decisions is crucial. It will be much easier to know what actions to take in the context of an overall strategy.

To reassess our strategy we need first to understand the strategy we have been pursuing and to identify its strengths and weaknesses.

Simply put, our strategy has been to make special purpose representations of cultural objects (catalog entries for artifacts and bibliographic entities), and to use specialized interchange protocols to combine these into union lists. The implications are that the representations needed to be uniform in content and often in data values. The major functional purpose we were trying to serve locally was accountability, and therefore the premium was placed on comprehensiveness. Ideally each object would have a record. It was acceptable for those records to contain a small quantity of well structured information used essentially for control (bibliographic control or collections management), and because comprehensiveness was important, the result was that our community invested in thin representations.³

This strategy has produced a legacy of records and of standards that fail to serve either the needs of broader audiences or those of specialized niche markets. In addition, our approach has been financially and intellectually costly for the heritage community because it doesn't exploit the major investments we make in interpretive content or make our richest value-added resources available to the public. And because it relies of standards that are not generally used by other database

3 The clearest example of how we thus became victims of our success is the 25 million object National Inventory of the Canadian Heritage Information Network which contributes little that will be of interest to the publics whom we increasingly want to serve with our information.

creators, this strategy does not help us exploit the investments made by those others (cartographers, makers of national biographies and bibliographies, companies creating sales catalogs, and the like), who employ other standards in construction of databases that document other aspects of society with which we would like to link.

Museum professionals, perhaps because they have sensed this or perhaps because they are simply uncooperative types, have been discussing the question of what standards to employ in creating digital representations of their collections but have made little progress in the past decade. We've held a variety of conferences on data value standards and while these have helped us become aware of many different thesauri and classification systems, there is still little agreement about the value of ICONCLASS, no widespread use of the Art and Architecture Thesaurus (AAT), and most of the systems ever presented are still being used by those who originally promoted them.⁴ There has been no agreement proposed or accepted regarding data value standards based on rules (AACR II for example) or formats common to other disciplines (ISSN, longitude/latitude, Greenwich time etc.). The community has organized numerous committees to define content standards. Some of these have attempted to create a standard for all kinds of objects and others have proposed standards for specific types of objects only. To date there is no widely accepted content standard, although the SPECTRUM standard may be on its way towards acceptance as a generic framework for data required to support museum processes and functions.⁵

The issue of encoding has not been addressed by the community so the standards generally followed by business have prevailed. The approach we've taken to encoding standards may have been, and still be, the only one we could have taken because operating systems and utility software are not specific to museums and the market has dictated ways in which systems will read. For text, today, this has meant capturing in ASCII. In the future, when systems generally can manage it, we may choose UNICODE. For image, the standard solution is still to get the

4 The situation today has changed little from the chaos reported in Andrew Roberts, ed. Terminology for Museums: Proceedings of an International Conference (Cambridge, MDA, 1988).

5 Museum Documentation Association, SPECTRUM (Cambridge, MDA, 1994).

best photographic images we can and delivering digital representations only as “use” copies for specific applications regardless of the standards they employ.⁶ For sound, digital recordings in audio CD standards are quality intermediaries if the human voice or instruments designed for human ears are the subjects.

At the level above encoding characters, pixels and tones, we’ve been promoting standards without articulating the specific success criteria that should be employed in evaluating their effectiveness. Indeed, museums have generally only attended implicitly, rather than explicitly, to standards designed to ensure the functionality of the data we capture. Those engaged in the somewhat arcane task of developing data value standards for museums, especially the companies that delivered collections management software, have long had to re-present the data, re-encode it, in order for it to do the jobs that museums want it to perform. It’s still essentially impossible to bring data from existing museum automation systems into a common view for use for non-collections management purposes as the experience of the Museum Educational Site Licensing (MESL) and RAMA (Remote Access to Museum Archives) projects have demonstrated. Soon most museums will face the equally important question of how they can afford to re-use their own multimedia data in new products, and they will find that the standards we have promoted in the past are inadequate to the task.

The fundamental incentive for museums to adopt standards-based information management strategies are, simply, that museum data is very long lived and information systems, generally, are not. Standards for cultural heritage information are the bridge between systems over time. Of all the levels of standardization to which museums could become committed, the most promising is content. But adopting standards should not mean standardizing in the narrow sense of making the content conform to specific values. Widespread adoption of content representation standards, rather than adoption of common content value standards, should be the objective. Some of the most promising standards we could adopt to ensure the longevity of museum content, such as SGML together with museum community defined DTD’s, do not dictate

data values. Other standards, such as terminology standards or thesauri, can be used in ways that exploit the variability of the data content rather than requiring its homogeneity. Nor should adopting standards, although designed to create quality data, be confused with making all content conform to someone else’s “high quality” standard. Effectiveness stands above purity in the hierarchy of values we need to promote - in standards the best is too often the enemy of the good. There is no evidence that use of “good” terminology will improve access or usability of the data we create and much theoretical reason to believe that a “preferred” term or form is less likely to be found than any term in a system that recognizes the relations between all terms.

The premise of standardization is that it will enable us to provide information to others in an effective manner. This means it must support appropriate retrieval and enable effective reuse without massive re-configuration or re-authoring. In order to choose strategies, therefore, we need to understand how data will be served to the public and in what ways they will use it. But the excitement engendered by the World Wide Web and its multimedia browsers should be an object lesson in how quickly the nature of the delivery environment changes. It reminds us that in thinking about how data will be served we should not be tied to *http* any more than we were to *gopher* or *ftp* clients. The failure of numerous experiments with interactive television over the past few years should be further cause for concern. The fact is that a decade from now the content we are making today will be used by people through technical mechanisms we cannot now envisage. Nevertheless we can know what conceptual purposes they will be using it for and what means of intellectual access they will require to locate the information of value to their inquires.

We must not forget that adopting standards is an investment which typically costs organizations a considerable amount up front. The gamble is that it will pay off for them or their clients down the road. Those who invest in making standards take an even greater risk -- the pay off will only come if many, and usually, most, others adopt the standards over time.

6 For further ideas on the state of imaging stands efforts, see Jennifer Trant’s article in this issue, p. 262-278.

II. Which Standards?

In the search for strategic approaches to standards, it is useful to distinguish between four different "levels" of standards which do different types of work: data value standards, data content standards, data structure standards and systems standards.⁷

A. Data Values: Knowledge Representation and Authority Control

Computers store and process data which is designed to represent knowledge. How we represent that knowledge should be determined by the processes we intend to support. Ultimately, certain processes will not be possible if they cannot use the data in the system. Because we are used to paper data storage and the human mind as our information processing system, we frequently identify the wrong data values to control. For example, humans can easily read and process the prose phrase from our wildlife encyclopedia - "In early autumn, the pelt of the arctic hare thickens..." - but a computing system will need to translate the concepts of 'early autumn' and 'thickens' into a calculable period of time (for example, 22 September - 21 October) and a calculable percentage of additional bulk (for example, +10%) and to link to an authority file in order to recognize that 'arctic hare' is a term used to designate a species of mammal, a type of hare, and that hares are closely related to rabbits. These expressions, when "re-presented" for computation, may be accompanied by degrees of certainty (for example, circa or approximately equal +/- 5%), which are, of course, fundamental to the prose they stand for, but even with such (equally calculable) qualifications the substitute representation is usable for searching and for comparative assessment of pelt in a way that the prose expression is not. The relationship between hares and rabbits may be needed to locate this or any other data about this specimen for a lay person.

Providing computing systems with appropriate knowledge representations to serve business needs is a critical strategic concern. It is increasingly clear that two very distinct questions must be answered along the way: which data will serve our business needs, and how should

⁷ For further discussion, see David Bearman and John Perkins, "The Standards Framework for Computer Interchange of Museum Information," *Spectra* (vol. 20 #2&3, 1993): p.1-61

we go about getting data to conform to knowledge representations that can be used for the processing purposes we envisage. Cultural institutions to date have probably answered both of these questions in a way that we will not want to continue in the future.

For example, in the above case, in order to ensure that the data was processable, we could:

- instruct data entry staff to create a record with the data formatted in fields for "time of capture" and "pelt thickness" according to structured data entry rules (Rule-Based Data Validation) and to check the term "arctic hare" in a thesaurus (Authorized Term Entry).
- create a lookup table which translates "early autumn" into a date range and puts the date range value in the field and another table which looks up "arctic hare" and places the scientific name of the arctic hare into another field of the database and the terms hare, rabbit, etc. into a related terms field (Vocabulary-Based Term Substitution)
- create a knowledge-base which will be linked to at the time of searching and processing to translate "early autumn" into a date range but leaves the prose in the computer record and which can translate searches for "rabbits" or "hares" into searches for the narrower term or scientific name for arctic hare (Knowledge-Assisted Search and/or Processing)
- build an application that accepts the terms "early autumn" and "arctic hare" as valid input and operates on them according to proprietary rules (Software-Dependent/Enhanced Data Validation)

Managers of business information systems, who rarely need to worry about the use of knowledge representations outside their applications or address issues which occur due to the instability of technology standards over time, will choose the first or fourth options because their efficiency can be optimized. To date, standards proponents in cultural heritage have opted for the third approach, but institutions holding cultural heritage information have resisted imposing uniformity on their data content. It is now evident that the cultural heritage information to which we want to support access will continue to reside in many systems created for many different local purposes. While we hope the aggregate will satisfy

our collective needs, it is also clear that documentation is labor intensive and there are many objects in the collections of museums so we need to define tactics that allow us to exploit the information that exists rather than adopting tactics that would require making data uniform across the world. It is now obvious that we couldn't, and shouldn't, demand that everyone use the same application even if we were in a position to give it away for free.

The first rule of data value standardization strategies for networked cultural heritage, therefore, ought to be to invest in knowledge representations to translate between disparate data values assigned by individuals with different backgrounds, perspectives, and local cataloging conventions rather than in technologies dependent on data uniformity. This strategy was adopted by the Getty Art History Information Program in constructing the Union List of Artists Names, which eschewed the concept of "preferred" name in favor of a cluster of names all used by different authority sources to represent the same individual. Earlier and in a quite different technical environment, AHIP, like others, had invested in vocabulary and terminology development that promoted "authority control" as a means towards data uniformity. I believe that as a consequence the museum community standard efforts have been less successful than they might have been, and much less successful than they need to be if the method for achieving the benefits depends on uniformity. It is critical to understand what has changed; later we can explore how the current products can best be promoted with the new tactics.

In a more centralized data storage and data processing environment, and an environment in which specific application requirements for control were the objective of new data capture, terminology standards were typically implemented in systems that employed term substitution and rule-based validation. The new computing paradigms for which we are now planning suggest that these tactical choices will no longer deliver the efficiencies we imagined we could achieve in the previous implementation environment but the full implications of these shifts have not yet been taken into account in vocabulary standardization work.

Even if we adopt appropriate approaches to ensuring processability, we still need to examine what data values we have been trying to control.

Here it seems that we have too often chosen to control the easiest things, proper nouns, rather than the data values most important to the applications we want to support. From the world of art databases, I have chosen two examples of data representation problems relating to physical description which are important and two examples relating to logical to identify some further questions we need to address.

Museums typically record the size of objects in their collections, but in human readable fields the display is processable by a human mind regardless of the consistency (or inconsistency) of the presentation. Thus a person has little trouble making sense of the measurements 10" x 4" x 300', or 10 inches (height), 4 inches (width), 300 feet (length), or 'about ten by four inches and over three hundred feet long when fully extended', while a computer will not be able to make much sense of these or necessarily even be able to recognize them as measures within a body of text. In most collections management systems, a method of representing size has been developed that allows the museum professional to calculate the size of a crate or frame or to inform a colleague from another gallery of the installation requirements of a traveling piece. These application processes are supported by the knowledge representation used. But what if we want to show various objects from different museum collections in relative proportion to each other? The representation of size in each museum's information system may help a person answer all such questions but they will fail a computer because they will be different from one system to the next and because their translation into processable form is typically software dependent. Yet size is one of the truly critical points of information used by human beings to understand the world and without it our data will be of limited use for the generalist or public user. We can immediately perceive the size of objects by bringing images of them into a single frame of reference, and this will presumably be one of the application requirements of our distributed image search and display systems, but how will knowledge representations support it?

Color is, of course, another characteristic that we use to understand and appreciate the physical world. Indeed the world of art is to a very large extent defined by color and other properties of reflected light. Digital representations of objects may contain textual descriptions of color or representations of pixels encoded to capture color values. In

either case, the degree of accuracy in the representations would seem to be an important measure of the value of the digital surrogate. Yet museums have not widely adopted standards for describing or representing color and the computing systems in use today are notoriously poor at rendering color consistently. Simple standards could be adopted that would enhance the value, and quality, of museum data to the public and would make searching by color easy.

Beyond physical description, the objects of our cultural heritage have meaning to us by their associations. In the past we've focused on conformity in naming the objects of these associations, the things (people, places, buildings, ships, etc.), with which the objects were associated. Increasingly it seems that we should have concerned ourselves with the relationships (creating, selling, designing, using, critiquing) between the objects and the proper nouns on which we lavished so much attention because as we examine the queries being put to us by our publics, it is obvious that each user community needs to know about quite different relations (and, as argued earlier, the nouns could be "controlled" without imposing conformity anyway).⁸ The difference between interests in where a group of objects were made, or found, or used, reflects the profound differences in intellectual perspective between the art historian, archaeologist and anthropologist. Our different publics are interested in exploring these kinds of associations in themselves, rather than in the compilation of lists of things with any association to a person or place. Types of objects, by their functions and their cultural meanings, and types events, by their personal, societal or corporate significance, are currently hidden in the data structures we have built to hold nouns, preventing the association of items used with religious rituals, objects given as tribute from conquered peoples, or designs realized by different creators.

Finally, people associate objects with specific, as well as with generic, events because it is through their relationship to events that

⁸ My preliminary analysis of some of these issues is reported in "Data Relationships in the Documentation of Cultural Objects", in Jane Sledge ed. *Categories for Description of Works of Art*. The paper is scheduled for *Visual Resources* v. 11. In page proofs it carried the pagination of p. 295-306. Additional work in exploring these relations is scheduled for a meeting in Crete in the spring of 1996.

many objects obtain their significance to us. Specific public events do not necessarily have proper names, rather they take their names from a combination of event types and the individual or organization at the center of the event, such as the Rabin funeral, the Kennedy inauguration, or the christening of a private person whose name would be meaningful only to family members tracing their genealogy. Whether events have names (World War II) or only constructed titles (the first Sputnik mission) or no regular means of identification, they occurred at a time and in a location and can therefore be searched and organized according to date and place if their knowledge representations enable it. Very little effort has gone into the creation of authority databases to permit access by events to date, but it will need to be a major concern in the future if we are to reach new audiences.

In general, the community has placed a great emphasis on making vocabularies which it urges professionals to use in place of their existing terminology and on making secondary data records to represent primary materials which use pre-approved language in their structured fields. Two important points should be made about this programmatic focus:

- (1) the information elements which terminology standardizers have chosen to control are no less important than those in the examples above which have not been emphasized to date, and
- (2) the pre-occupation with terminology control has reflected the state of computing which, until very recently, required controlled terminology. But we must acknowledge that some of the resistance to the use of controlled vocabularies at the front end of database was simply a reflection of the fact that individuals employed in museums rely on their professional training and expertise and do not take well to formal rules. For these reasons they often resisted prescribed lists of terms and thesauri even when these reflected the very best thinking within their own professions. Nevertheless, there are legitimate reasons for resisting the use of prescribed terminologies. Often there is nuance in the choice of particular local or historically correct terms to describe an object, sometimes the "literary" requirements of a piece of text justify variety in the choice of terms, and sometimes the functional requirements of a particular application

demand a different representation of the information than is suggested by the controlled terminology.

Until several years ago, the appropriate strategy for museums with standards-based commitments to reducing risks and increasing their opportunities to exploit the value of their data would have been to override the objections to imposing controlled vocabularies in the face of the greater advantages to be gained from its imposition. Recently the advent of alternative approaches and new computing technologies which do not depend on rigid structures of the more limiting databases of the past, have led to reconsideration of the way in which controlled vocabularies can best contribute to standards-based strategies. Instead of emphasizing their role in imposing values on data entered into databases, the new approach sees the value of such vocabularies in intermediating access to uncontrolled database language.

Instead of making such vocabularies in a quality controlled workshop staffed by a highly specialized central staff, the new approach envisions making vocabularies through distributed linking of practice as it is reflected in usage of all users.

It is worth noting that the value of both "term switching" or "vocabulary enhancing" search strategies and of distributed database construction are not well proven. Nevertheless, there are some good reasons to believe that in the future terminologies will be used primarily to enhance access rather than to control data entry and it is self evident that the limits of centrally staffed database construction are finite and have been reached. Cautious managers will want to continue to exercise some control over data input as well as watching for implementable terminology solutions in search and retrieval systems.

B. Content Standards

In order to enable the distributed construction of data resources, the museum community has expended substantial effort on defining data content standards such as the CHIN data dictionaries, the CIDOC Data Model, and the AITF Categories for Description of Works of Art. These data content standards addressed only one of two issues which such standards must resolve: how to locate information of a particular type,

but not how to act on it. We could label these two problems as "content designation" and as "supporting processable data types". The approach to data content standardization reflected in the physical, logical and conceptual models referred to above presumed that the aim was to standardize, in the sense of homogenize, the defined elements of information managed by a Database Management System (DBMS) with field labels as markers served only as content designation. While the approach was adequate in a world of central computing systems and union databases where common functionality was dictated by common processing environments, the disadvantages of assuming such structures for distributed access are now apparent. Even if interchangeability of data between DBMS's could be achieved, it is not clear that museums would be willing or well advised to make the sacrifices necessary to achieve homogeneity based on physical equivalence of data structures across different institutions and platforms.

An alternative method of content designation which additionally addresses the support of processable data types, and enables the modularization of functional attributes of data types so that the same data can be used from a multiplicity of perspectives, is to "mark up" the data with SGML (Standard, Generalized, Markup Language) labels. Because SGML parsers (systems designed to read SGML tagged data) are designed to accept "arbitrary" Document Type Definitions (DTD's), they are able to read SGML tagged information without regard to the software dependencies of the systems that created it and the nature of the language is that it should be readable over time even as SGML and other standards change. Unlike interchange formats developed for special reasons, like the MARC format or EDI, SGML does not have limits on the modalities of data it can hold, on length of records, or on types of receiving systems. Furthermore, it can be easily transformed into MARC, EDI or the proprietary data structures of the locate DBMS.⁹

One of the benefits of using SGML as a standard, and adopting community agreements on how to label objects using SGML standards, is that it brings the museum community into congruence with other humanities which have adopted SGML as a way to mark up full texts of

⁹ For more on SGML in the museum context, see David Bearman, "Issues involved in Using SGML for Data Interchange," *Archives and Museum Informatics*, v.8#1: p.74-79.

humanistic primary source materials, such as archives and manuscripts, as well as published texts. This permits a variety of users, over time, to mark the same information from numerous distinctive intellectual perspectives, or at different depths for specialized application needs, while benefiting from and building on the effort of previous analysts.

However, the mere choice of SGML as the means of locating data types in cultural heritage information systems (a choice endorsed by the Committee for Computer Interchange of Museum Information in 1993 and being pursued by the Consortium for Interchange of Museum Information today), does not help us to determine what content to mark or how to represent it. The choices involved in implementing SGML will determine the degree to which it is accepted by the community and the benefits (if any) from its use. So far the suggestions made by potential "standardizers" oriented towards SGML-based solutions have not demonstrated sufficient sensitivity to application requirements, and, at the same time, have been overly driven by physical rather than logical data content. An SGML-based strategy for interchange of cultural heritage data but it will be successful *if and only if* the DTD's it advances serve the application purposes of the data contributors **and** that support the cumulative construction of cultural knowledge-bases. Only tactics that enable the aggregate work of many people over time to populate the fullest possible content designation will succeed in producing documentation which reflects the sum of the perspectives of many disciplines and is affordable to the community.¹⁰

For example, in the title of the painting "The Constitution in Newport Harbor" there is a reference to a ship and to a place. In databased computing environments we would have identified this as the title of a painting (by placing the data in the field with that label), and the ship name and place reference would be lost. Thinking more carefully about representation of the data, we could "mark" the internal contents of this field to allow for retrieval of references to ships and to cities independently of where the reference takes place. This would allow us to create indexes by place and proper names of ships thereby satisfying several potential uses that otherwise would be lost. If these uses can

¹⁰The current proposal for "Encoded Archival Description" (discussed in the standards section of this issue) is an example of a proposed DTD that fails these tests.

justify the added cost of mark-up, or better serve the mission of our particular organization, then the aspects of the DTD which permit deeper mark-up of content elements within content elements will be exploited. If not, the organization doing the mark-up would not use the deeper markings, although others might later add value by inserting such markup for their own purposes or re-use. If the title of the above painting was contained in a paragraph of text which noted that the artist was, at the time of creating the work, actually visiting with the Stephenson family in Charleston and used as his model "The Maiden", a civilian fishing vessel, the value of both the ability to mark deep content and to ignore it becomes clearer. A maritime museum which had the anchor of "The Maiden" among its holdings would almost certainly consider this important enough to warrant detailed content designation while an art museum holding the original painting would likely settle for marking the entire paragraph as "history of creation". Ideally, knowing that "The Maiden" was a boat out of Charleston should allow linking to registers of vessels and to footnotes in literary criticism which reference the same boat.

Not only should any DTD allow the markup of content from different intellectual perspectives and uses, thereby serving different audiences, but we need to alter our expectations about when and by whom "documentation" occurs. Specifically we need to accept that documentation takes place over time and that everything which is written (spoken, drawn) about a cultural artifact out to be brought meaningfully into the sphere of documentation. We need to begin to see documentary and interpretive acts as a continuum rather than as different and accept that any "facts" about an object should be attributed to someone, some time and place, and some authorities if relevant. This purpose was central to the Architectural Documents Advisory Group (ADAG) data model. I was highly critical of at the time of its production because it was advanced as an implementation which presumed, despite the obvious and insupportably immense overhead, that each documenting agency would capture all such information in a single pass even if it needed, for its own purposes, only a small amount of that information.¹¹

¹¹David Bearman, "Buildings as Structures, as Art and as Dwellings: Data Exchange issues in an Architectural Information Network," in Lawrence McCrank, ed., Databases in the Humanities and Social Sciences, vol. 4 (Medford NJ, Learned Information, 1989) p.41-48.

If we are to have rich cultural documentation it must be the consequence of independent, and subsequently integrated, actions of many documentalists and interpreters over the lifetime of the cultural object. Early in my professional career, I encountered a natural history museum which held a painting of a beaver that it had documented by recording the species name in Latin and the date of the painting but had not felt it necessary to record the "artist", "title", or "provenance" of the work. Needless to say, a visiting art historian was scandalized and felt that this was evidence of poor curatorial and documentation practices. But I believe it reflected a sound documentary practice for that museum, while I simultaneously felt that it would be important that the art historian be able to add information of significance to his perspective without having to create a new record or new system. After all, the art museum documented similar paintings without reference to species or other elements of information essential to the natural history curator. As a rule, our methods and systems should enable each user or institution to research items from their perspective and record information to serve their needs. If we can design standards that enable this to take place and information to flow from one model to the other, then we have achieved a method for cultural heritage knowledge base construction that can be widely adopted to the benefit of all. Over time, documentation will be broader and deeper than it can be if only one source of cataloging and one authority prevails.

Another of the more exciting properties of SGML is that if we adopt DTD's with sufficient power to capture the content desired by the most demanding researcher, the hierarchical structure of the SGML language allows us to equally well (and more frequently) capture content at a very general level. This kind of facility is not available in fielded databases, where either we must have some fields whose content will be sometimes very general and sometimes very specific (making them virtually unusable) or require users of the structure to enter data at a level of detail they do not know and cannot afford to research. At the extremes, SGML or full text hierarchically sensitive markup, allows the equivalent of designation a document without any further markup (full-text) and designation a document with such complete mark-up that no fielded data structure could accommodate it without incredible redundancy and extraneous data input. Since we want standards that permit efficient and cost effective capture of primary content and which allow content to be

rendered for users according to their point-of-view rather than simply the point-of-view of the documenting agency, these features of SGML are of great value.

Finally, as the acceptance of the WWW should tell us, cultural heritage institutions, and the audiences for their information resources, are almost unconsciously aware that multi-media is the more powerful and potentially more profitable content than text surrogates. SGML has the great advantage in this regard in that it allows for the objects being marked to be text, sound, graphics or image and, even more importantly, provides for meaningful links between them. We know that such multimedia data will be of greater importance in the future, and that the National Inventory, or Index to Canadian Heritage, would be greatly enriched by images of the primary documents and objects to which they refer.

C. Application interfaces

For the past decade, thinking about museum standards has been dominated by the hope that either a museum network standard for museums could be developed into which commercial applications would fit (the RLG-AMIS project and the Remote Access to Museum Archives -RAMA project both imagined this as a successful outcome) or the hope that museum collections management applications developers could be persuaded by the market to implement museum community specific common interfaces (the Z39.50 museum data set, EDI museum object loan data set, etc.). Not only have these solutions not worked to date, they are increasingly looking like the wrong answers.

Probably the most important development of the past few years in the potential for a standards-based museum information management strategy, has been the adoption by museums of a range of commercial utilities or generic application services which support their broad missions. This has meant that the ultimate benefits of automation to museums will be realized through a variety of commercially vended applications that support specific business functions of the museum such as authoring tools and presentation managers for exhibition and interactive education, desktop publishing tools for museum publications, commercial store inventory support and fulfillment systems for museum

shop sales, and general purpose fund raising tools for membership and development. Software developed for these application areas is sold by commercial firms with dis-incentives to adopt common standards within their niches (and none to adopt museum community standards) but substantial incentives to adopt cross application standards. Now, because museums are like other clients of the software applications, the potential standardization can occur through layered architectures which are becoming the industry standards.

The implications of these developments for a new standards-based strategy need to be spelled out further. Either layered architectures or client-server architectures allow the creation of another piece of software (technically a "client" or an API service) which takes the data from the vendor application and passes it to a different vendors' applications. In many respects this will be the biggest breakthrough for museum computing, if it can be implemented, because it would not only enable museums to save the value in their data but enable them to engage in cooperative applications with others. Client/server approaches can further insulate the end-user from the specific requirements of different application software while communication between software of different origins is enabled.

Standards that enable different software applications to exchange data in a format suitable for manipulation would enable suites of application software to be acquired from a variety of sources and still exchange data using SGML. This would allow museum consortia to develop "museum workstation" tools that acquired data from numerous sources and performed tasks such as displaying them in 3-D mockups of exhibition spaces, arranged for their custom brokerage, delivered them to classroom teachers, and provided them to value-added resellers in a variety of commercial sectors.¹² An example of such a standard would be a protocol that supported the requirements for end to end licensing of museum controlled intellectual property including data interchange and directory services. Without such a standard, museums will not be able to easily make their properties known to the potential

12 The Canadian Heritage Information Network and some commercial and museum sector partners have recently been awarded a grant from CANARIE Inc., the "Information Superhighway" funding agency in Canada, to develop just such a set of tools.

user community. With it they could link a range of separate databases into a service.

Another example, which the AHIP Vocabulary Control Systems (VCS) project has already proposed to address, would be to develop interfaces that allow applications which create databases to take advantage of remote authority files controlling the content of different fields within the authority and to update remote authority files with new term which represent found uses of concepts in the literature. This kind of two way interaction has been envisioned in a model for the prototype of the VCS system.¹³

D. Systems Environment

In the new distributed computing environment the purpose of creating database/imagebases is to as much to support re-use of the data content as to provide the "published" product. The ability of the end user to link to, copy, transform, or otherwise exploit relevant pieces of information is a critical measure of the value of the product. Standards for known or knowable data structures only go part of the way towards ensuring that valuable data will be able to support have multiple uses. Making information reusable involves also requires that make the content of the data malleable, especially algorithmically, to support different points of view.

To date, most of our discussion of documented data structures rather than true "inter-operability" with the emphasis on the kinds of operations we can expect to support. Here we the issue which I have elsewhere discussed under the dual headings of the 'fungibility' of museum data and the issue of 'reusable quality'.

The fundamental question we must answer here is how much we should invest in making our data more standard than it needs to be for the specific application in which we are going to use it next? The answer, logically, is that we should make additional investments if:

13 For further information on the design and purposes of the VCS prototype, contact Joseph Busch, Program Manager, Getty Art History Information Program - jbusch@getty.edu

- there is reason to expect we will want to reuse this data for another purpose in the future, and
- the cost of the additional investment is significantly less than the cost of remanipulating the data for a different purpose later.

Economically, of course, we must also answer in the context of the cost and availability of capital for this investment. These measures become more complex, but the ultimate gamble is that we will save substantially in the future by making the data we use more functional now.

A single example will suffice, I believe, because it is so widely shared. Cultural heritage organizations are making substantial investments in digitizing their collections for publication, exhibition, and education. How much effort will be required the second time the same data (an image and accompanying text is needed. Is there anything we do now that would reduce the likelihood that we'll need to recapture from the same source in a decade?

We can't answer this obvious, and critical, question without examining current practice from a new perspective. We need to ask how often we are able to take analog images and existing text prepared for one purpose - say a catalog raisonnee - and use it for another, such as, for example, an exhibit catalog or school tour unit? If we currently edit the content of each node (the image, the caption, the introductory text) for each application, how could digital technology change our practices? An example of a kind of re-use not enabled by analog technologies is that paper-based systems do not give us the option of organizing our text be artist for one users, by period for another, or by geography for a third. This luxury could be supported in digital content source databases if we used appropriate standards for node naming and for linking. In principle, content could be refashioned without each re-use being expensively reauthored.

Typed data allows us to exploit the promise of formal design methodologies, such as Hypertext Design Methodology (HTDM), in authoring content in the future. The premise of HDTM is that if we focus on links, we can support re-use of data through algorithmic and dynamic authoring. It seems obvious to me that we should be testing this

hypothesis, and if it proves plausible, we should be examining what qualities of the original data make it most or least suitable for re-use. We should be defining markup strategies that support editing on the fly and investigating the points-of-view of our audiences to understand the "frames of reference" which would need to be similar to AI frames in that their slots could be filled from existing knowledge schemas developed for other purposes. While this may present us with a series of research issues for the very long-term future, the medium term issues will have to do with the kinds of standards that could support link structures created by different applications.

III. Where Standards? Tactics for the new computing environment

Future directions for standards need to make a few assumptions about the kind of computing environment we will see over the next decade. My assumptions are:

- Distributed
- Networked
- Object oriented
- Primary resource rich
- Targeted at end-user points-of-view
- Smarter agents
- Value is added by functionality
- Rapidly changing

Distributed

If information can be distributed and still used effectively, then there is no need for projects to bring all of it together in one format and at the same time there is greater need to develop on-going programs grounded in standards that serve as common denominators between the methods and mission of diverse creators of information. To give an example - we don't need to have a 'Dictionary of International Biography' or 'World Gazetteer' publishing project because national agencies are devoted to documentation of important persons and place names, but we do need common denominators to view the data created by these entities which is slightly different from nation to nation because of special requirements

of the missions of each responsible agency. The advantages of distributed databases could be significant if the information resources, such as image bases, are very large or the missions of the entities that could be contributing data are sufficiently different to require each to have slightly distinctive data structures.

Networked

If information resources are networked, we don't need to bring them onto a single machine, and indeed must make them usable from a variety of different platforms. Networked access means that the resources will need to be served to a variety of different network clients. It also requires attention to directory services which will co-locate all the relevant resources.

Object oriented

Because we can't be sure what kinds of software functionality will be available to the objects retrieved by searchers, it is useful to be able to bundle the packets or information (records) they retrieve together with the software required to open and render them. Using object-oriented approaches allows us to do that and to take advantage of facilities in widely available object oriented API's (Application Program Interfaces).

Primary resource rich

Until recently, the information we have been able to provide access to has been secondary information: bibliographies but not the books, provenance records but not the documents, museum catalog data but not the objects, and terminology but not the texts and images that give it warrant. Scanning, digital photography, dropping storage costs, larger bandwidth networks, and similar developments are about to fundamentally shift the ratio of primary to secondary material available electronically.

Primary material is what it is. The "editors" may annotate or footnote it, but they cannot change the actual words it uses or the image itself. In itself this should lead us to undertake a reassessment of what it means

to have controlled terminology since term replacement is not among the things we want to do with primary resources.

In addition, primary resources force us to think about other aspects of what "quality" data means. Images without color bars and gray scale bars, or without scale indicators, for example, are as seriously deficient as serious scholarly information sources as texts without citations or attributions without authority.

Targeted at end-users points-of-view

As the Getty AHIP Points-of-View research is beginning to reveal, users are interested in what they can do with "things" (entities) and what relationships "things" have to each other.¹⁴ Searching for the "things" themselves is likely to produce lots of references that do not satisfy the users point of view. In the past the bulk of effort in descriptive cataloging whether of objects or of books has been devoted to the things (artists names, places, title of book, name of auction house, etc.) and little attention has been paid to the way in which that data was recorded in structured databases to preserve appropriate relations.

Substantially more research along the lines of the Point-of-View project is desperately needed, but even from the preliminary findings we can see that standards for naming relations and for making relations searchable will be required as will prototypes demonstrating how end-users can locate relations (things offered for sale; things used in a religious setting; things, including people, events, buildings, present in a given place at a given time). Some of the work being pursued now to explore semantic indexing as a means of representing knowledge of relations will be important in this regard.

Ultimately this has immense implications for standards, especially vocabulary or terminology standards, because it recognizes that primary materials, and information products created for niche markets employ the specialized jargon of their authors (including, perhaps, terms that are now obsolete or have different meanings) and that rather than controlling

¹⁴Jane Sledge and Mary Case, "Looking for Mr. Rococo: Getty Art History Information Program Point-of-View Workshop", *Archives and Museum Informatics* v.9#1, p.124-129.

the language documenting these things we can build directories that will enable intelligent discovery of resources based on the relations between things, which is what users want. The advantage here is that many of these relations are inherent in entire bodies of evidence - all sales records are about sales relationships, all ecclesiastical records are about relations of the church, anything entered into a matrimonial register is about a marriage relationship, etc.

Smarter agents

The volume of information resources in the distributed environment and the rapid rate of change and growth will overwhelm individuals trying to keep up with their fields. Information seekers will be fortunate to have smarter software agents acting as their surrogates in many searches. These agents will need to have profiles of the interests of their 'masters' which are supported by thesaural term explosion and are able to utilize knowledge maps of considerable semantic complexity.

Value is added by functionality

In the future computing environment data will be in surplus but functionality will continue to be at a premium. If information can be made available with functionality, it will sell. Because the environment will be dominated by client/server architectures, this means that information providers will want to give away or virtually give away their client applications because it is these applications that will make the most of their data and their data which is sold and resold. This logic has led many to envision a networked world in which very small sets of functional code, called applets, replace the current application software market. They are easy to use, ubiquitous in the computing environment, and charge only pennies for each use. In the long term, however, like the airline reservation scandal of the 1970's, the "hidden" code of the applets will determine what information people find and how they are enabled to use it.

Rapidly changing

The only constant we can count on is change, and it would appear that the changes we can expect in information technologies over the next decade will be at least as rapid and unpredictable as those we've experienced in the past ten years. If so, our standards strategies must be accompanied by implementation tactics that are constantly being rethought - after all, it was not the strategies that went fundamentally wrong in the past decade, it was the changed implementation environment that has forced us to re-examine how to best make standards work.

The definition of a such new approach to standards must therefore begin with a critique of the implementation assumptions and tactics we have adopted to date. At the outset of this paper I referred to the alacrity with which museums have adopted the standards of the World Wide Web. Many of those who have done so don't even know that the World Wide Web is the consequence of implementing the http standard or that the Internet is another name for communications services using TCP/IP protocols. Newcomers to these information services are not aware that "ftp" clients use the ftp protocol or "telnet" functions are based on the telnet protocol, another standard, or that each of these standards is very young and likely to be supplanted by others in the near future.

If we do not recognize where standards are being used, and how our applications are dependent on them, we will not be able to exploit standards developments to increase functionality and value added to our data. In the applications that users are running to access the Internet, client software for numerous access methods is supported, but a few years from now other access methods will have supplanted ftp, telnet and http. This is both good, and bad, news because on the one hand it means that a variety of Internet applications can live together within an application suite, but it also means that evolution will leave many "standards" behind. While it may appear today that the Internet is the end all and be all of inter-networking we can safely expect that it and the simple functionalities of the Web browsers which brought so many new users into this realm, will be replaced, upgraded, and ultimately left behind.

Last year, when we celebrated the 25th anniversary of the extraordinarily successful MARC standard (ANSI Z39.2/IS 2709), it was evident both how unusual it was for a computing standard to last that long and how out of step with contemporary computing architectures the standard seemed. What was less evident (especially to librarians) was that the standard, precisely because of its success, had shaped the data content of library information systems. The http standard will probably not last half as long, but the use of HTML has already led to creation of content that is limited by HTML which is simply inadequate for representing some of the complex contents we want to make available over networks. Professionals concerned with the need to represent the complexity of cultural data need to contribute to the recognition of these inadequacies by demonstrating ways to exploit more powerful standards (such as SGML) within the World Wide Web and the Internet environments. In this role they would be educating its community in the functional requirements for cultural heritage information discovery, search and retrieval while helping to develop standards that go beyond "browsing".

While browsers allow for access, on a site by site basis, to those objects that have been "put in the window", browsers do not have the functionality required by scholarly or public applications. Specifically, we can't enter into an iterative dialog or intelligently manage a search in a large universe. Searching will require the successful implementation of multi-host access, if this can be provided using ANSI Z39.50 (which is being developed in conjunction with CIMI, the Consortium for Interchange of Museum Information) or SGML enabled search systems. Another option is to extend the facilities of the very important WAIS (Wide Area Information Service) search protocols. Still, many other kinds of specialized protocols will be necessary to support other functions associated with searching museum catalogs and cultural heritage databases.

IV. Conclusions

Standards aren't good in themselves and cultural heritage leaders should not support them simply because others do. Implementation of standards is complex and depends on more than just a worthy idea. Users must see pay-off and the strategies must be supported by flexible

tactics.¹⁵ Indeed, adopting standards-based strategies requires serious attention to desired outcomes and continuous balancing of risks and benefits. Research in fundamental issues affecting humanities computing could have a significant impact on strategies we adopt for standardization in the future, and must be pursued with vigor.¹⁶

One of the ways in which future activity could be coordinated and resulting standards could contribute to construction of viable implementations would be to push for acceptance of a common reference model, such as that proposed by the ad hoc AHIP/CIMI working group in December 1994.¹⁷ With the adoption of such a framework, efforts to improve the CIDOC data model, for example, could be focused by the needs of users querying authorities and primary sources. Designers of systems for authority data and those making cataloging rules for bodies of primary materials, would be informed by the data structures at the heart of the "prism" model and could make tactical decisions about the degree to which their contents overlapped and software engineers developing search and discovery tools could assess how to use representations in multiple independent authority files to support access to primary sources. The convergence of many strands of standards efforts, and their reconsideration of basic principles in light of distributed computing, provide an opportunity for the major players -- CIMI, AHIP, CHIN, CIDOC -- to embrace a common reference model and begin to populate it with standards built around common principles.

¹⁵ At the present moment, this means that we need to make a convincing argument, backed by demonstration, of why HTML which is already proving acceptable to many museums for its Web uses, is inadequate. We would be remiss if we did not acknowledge that the implementation of HyTime is both difficult to achieve and unlikely to have a real market presence. And we need to accept that some technophilic museum directors have already decided that VRML is the language in which the popular museum applications of the future will need to be represented, and that most are less interested in data interchange or data preservation than in presentation and display.

¹⁶ For a review of such research opportunities, see David Bearman, "Research Issues in Arts and Humanities Computing" and other papers submitted to the Getty AHIP Research Agenda Conference at www.ahip.getty.edu

¹⁷ David Bearman, "CIMI Entertains New Framework," *Archives and Museum Informatics* v.9#1 p.120-123

Developments in Multimedia in Belgium: The Musée de Louvain-la-Neuve's Commitment to the Exploration of New Technology-based Access of National Cultural Heritage

Xavier Perrot

The Museum of Louvain-la-Neuve is a Belgian University museum which has the dual mission of:

- being open to the general public, and
- being an experimental facility for students and scientists doing research in the fields of museography, art history, and archaeology.

Bernard Van den Driessche, the museum's administrator, stressed that the museum's location in the basement of the Faculty of Philosophy and Letters (Erasmé College of Louvain-la-Neuve) contrasts astonishingly with the wealth of its collections which span Africa, Oceania, Asia, America, and Europe, from prehistoric times to the present. The museum holds the anonymous works of artists from India, Classical Greece, pre-Colombian America, Rome, China and the Western Middle Ages as well as pieces signed by Picasso, Magritte, Delvaux, Lhote, and Delahaut. It has a prints cabinet that has been recently expanded with a donation of 1500 engravings, covering the history of this technique from Durer to Picasso. With 1,250 square meters of public space (approximately 12,000 sq.ft.), divided between seven exhibition galleries, the museum welcomes 15,000 visitors annually to a city of 20,000 inhabitants, 30 km away from Brussels.

Xavier Perrot (XP): Is your museum a public or a private organization?

Bernard Van den Driessche (BVDR): The museum's collections and building belong to the University, so *stricto sensu* it's a private museum.

XP: What is the relationship between the Museum and the University?

BVDR: Within the University it is seen as a scientific unit. In the setting of the new city of Louvain-la-Neuve founded in 1971 following the separation of the Catholic University of Louvain into two linguistically autonomous universities (the Katholieke Universiteit Leuven and the Catholic University of Louvain-la-Neuve), the museum plays an important role as a cultural support for the university and for the center of the new city that grows every day, the university being its matrix. The museum director is a member of the faculty of the university. Three other persons belong to the university staff: the administrator and two part-time people in the computing department. The university finances 20 percent of the salaries of five other staff with the Ministry of the Wallonne Region subsidizing the other 80 percent.

The introduction of data processing to the museum dates to 1987, used at first to alleviate administrative tasks and to improve the texts and the visitors information. French speaking readers should consult the December 94 issue of *Courrier du Passant* (#38), the museum's newsletter, which explains in an easy-to-read and informative style how the use of multimedia has spread in the museum. The Association Francophone des musées de Belgique also published last year a well documented report, "L'informatique au musée" (AFMB - Parc du Cinquenaire, 10 - B.1040 Bruxelles). English speaking readers can refer to the ICHIM'93 proceedings, in which Christine Demblon and Michel Lefftz wrote a paper entitled "Interactive MultiMedia Information Service." In brief, the Louvain museum is currently developing of a collection management system for researchers and curators that will store scientific files for each object.

Since 1991 museum-goers have been welcomed by an interactive entrance display - the first one in Belgium. There are two permanent kiosks in the exhibit space:

- a simplified scientific presentation display (presented during ICHIM'93 in Cambridge), located in front of two groups of baroque sculpture. It documents different aspects of the artworks, eg: stylistic, iconographic, historical or technical.
- an instructional software program about Greek antiques, made with Hypercard 2, featuring 850 cards about shapes and uses of cerXpC. It has been deliberately left in black and white so that visitors will have a greater interest in going to the exhibit cases to see the real piece (Of course the choice of black-and-white images was also a historical constraint of the original HyperCard version. It may yet be converted into a Director color template that could be easily customised for any museum's vase collection.). This educational application is not permanently situated in the museum, but rather is used with visiting groups of students.

The museum computing department has also developed a pilot popularization interactive - a kiosk about a tall statue of "Chief Ndenges," from Zaire, but it is not yet in use. Finally there are also several specific productions developed for travelling exhibitions, such as the one made for "De Dürer a Picasso. Cinq siècles de gravure en Europe." ("From Dürer to Picasso: Five Centuries of Engraving in Europe.")

In response to a call for proposals from the Belgian Federal Bureau of Scientific, Technical and Cultural Affairs [Bureau SSTC, Mme. Belleflamme, Rue de la Science 8, B-1040 Buxelles, Belgium; phone +32-2-238-3411], the museum has become a major partner of the EOLE project, aimed at providing network access to multimedia information on the Belgian cultural heritage. Among the other partners are:

- Koninklijk Museum voor Schone Kunsten Antwerpen
- Musées Royaux d'Art et d'Histoire de Belgique
- Bibliotheque Royale Albert 1er
- Koninklijk Instituut voor het Kunstpatrimonium
- Universite catholique de Louvain

- Belgacom
- Kodak
- Service general d'appui policier
- Ministere de la Region Wallonne (Direction de l'amenagement du territoire, Division des Monuments, sites et fouilles)
- Le Cridit Communal de Belgique
- Le Centre a'auto-formation et de formation continue (C.A.F.)

The project is part of a gamut of promotional applications providing remote access to data banks. The data in this case concerns the Belgian cultural heritage and is made of pictures and texts. The project is shaped upon a client/server architecture. There are those who provide the data, and those who will access them. All the users employ telecommunications as the means for interacting. The first ones, coming from the nonprofit sector (scientific and cultural federal institutions, administrations, museums, public collections, security services for artworks, educational, etc.) might also become "customers", and therefore finding themselves on the "consumers" side with SME companies (tourism, publishing, audiovisual, art merchant, advertising) and with individuals (home market).

The EOLE project proposes to link the different partners of the nonprofit sector with some SME (Eurolingo for "Small and Medium-size Enterprises," which are what we would call "small businesses") by a network permitting the diffusion of the data, the interaction, and the related commercial transactions. The access customer interface will be fast, user-friendly, and should be able to run on all common platforms. This client software will be free or at least very affordable. The access modes to the server will depend on the nature of the users and of their needs, e.g., different image definitions from low quality screen preview up to 2000 dpi documents.

The "marketing target" belongs both to the nonprofit sector and to the SME business domain. Some "sample customers" representative of these different sectors are partners in the project. Among the users from public sector, no one in Belgium currently uses telematic applications based on the exchange of multimedia data. Among the users from business sector, the use of the telematics is very variable, but one doesn't observe any effort from the nonprofits toward the potential SME users.

One of the project's goals is to involve the general public as a "customer" during the second phase in the diffusion of the data. The availability of the free versions of the client software should allow the utilization of the system by a wide audience.

In order to achieve the stated objectives, it is necessary to use a telematic system extensively implemented in Belgium or close to being easily available. The ISDN network is among the best choices and, besides the regular phone network, there is also a national "Belnet" system. The participation of Belgacom as an associated partner will allow to develop the ISDN in an intensive manner.

The number of documents produced during the course of the first phase (about 3,000 during phase 1 and 3,000 others in phase 2) is supposed large enough to test the technical infrastructure of the server as well as the diversity of the uses. On the other hand, this "relatively limited" number in comparison to the quantity of evidence of Belgian cultural heritage permits us to make changes at each step of the formative assessment. The documentation selected will be relevant to objects of architecture, painting, sculpture, the goldsmith's art, textiles, stained glass windows, drawings, engraving, cerXPCs, furniture, and miniatures. The selected heritage will cover the different communities and regions of Belgium.

Furthermore, the presence in the syndicate of one partner with experience in digital watermarking will enable us to develop solutions to the fundamental problem of copyright. By this new technology, the right of the photographs' owner will be entirely guaranteed, since his or her mark will remain registered in an invisible manner for the user on each image. The rights of authors and owners of the objects will be handled in a similar way to the existing situation with traditional photos.

Xavier Perrot also asked a few specifics of Michel LEFFTZ, head of the computing department of the Musée de Louvain-la-Neuve.

Xavier Perrot (XP): What is the project schedule? When do you hope to have it completed?

Michel Lefftz (ML): EOLE starts October 1, 1995. Phases 1 and 2 will last two years each (Phase 1: October 1995-October 1997; Phase 2: October 1997-October 1999). The project will be evaluated by a grant from the public administration after the first phase and before the second phase is launched. They have an "input" role as initiators, but the project will have to be self-financed -- at least partially -- to continue in the next millennium.

XP: EOLE is about distant access to a multimedia documentary database. Will it include any sound sequences or motion pictures?

ML: At the heart of the database are the images of cultural heritage objects. The images will be accompanied by brief textual entries consisting of both key words and free text descriptions. Our partners, the suppliers of pictures, will provide only still images of very high resolution (4 x 5 inch formats in which they have excellent experience). But some tests will be also undertaken with smaller formats such as 35mm film.

XP: The goal of capturing 6,000 items sounds very ambitious. Who is going to finance the cost of the digitization? How will the content suppliers be involved in that?

ML: For us, the 6,000 pictures target is just a good starting point, sufficient to test the system and its access. We will use the "musts" of Belgian cultural heritage. The role of the public administration in this program is to encourage some "end user" oriented telematic projects. Therefore the digitization of the pictures is not the first objective, but rather is designed to help the institutional partners of this project to produce a minimum of content. It is anticipated that others will acquire the necessary equipment for scanning the images. The Royal Institute of Artistic Heritage (IRPA) which has the primary mission of ensuring the documentation and the restoration of heritage, will capture the majority of the images with their scanning equipment. Other institutions such as the division of Heritage of the Wallonne Region, the Royal Library, or the Royal Museums of Art and History will also produce photographs that will be scanned either by IRPA or by Kodak. So, we will also be able to compare the two scanning solutions.

XP: Over the next decade, as the project matures, will your client-server architecture permit the exploitation of a distributed data model?

ML: The EOLE server will essentially contain the images of Belgian cultural heritage, a set of data that all of the partners need to have access to. In the future, the institutions will develop their own servers containing their particular data; these servers will be also able to contain the classification file of one building, or the inventory card of one work, and refer to the images contained in EOLE. If the institutions want it, access to EOLE will serve as a transparent routing gateway to their servers. During the second phase we will implement access for the Internet users who will have access to "thumbnails", and from them will be able to directly access the institutional sites if they want to know more about one particular piece.

XP: How will you organize the user interface for information retrieval? Will the server be connected to the Internet? If you employ thesauri, how will you make them "usable" by the general audience? Will you offer some "guided tours" or some "points of view" on this vast corpus?

ML: We currently foresee two user interfaces, a Web-like Internet access and a specific client access permitting more specific queries and a more customized management of the data. In our work we certainly want to be guided by what has been done elsewhere and we would be pleased to receive advice and references from your readers. Our essential constraints are: the user-friendliness of the interface and the low price -- if not for the free nature -- of the client software. JOCONDE, a service of the French Ministry of Culture, is a good example of WWW access which enables researches to access materials with a few key words. What we are going to set up should, however, emphasize the visual materials in the fashion of the regular printed picture catalogs. Some of our institutional partners, such as the department in charge of tourism, could develop guided tours across the assets of cultural heritage we will be presenting.

The thesauri issue is relatively limited in our case, since we will use only use identification criteria as key words. The in-depth analysis is being left to the institutions. EOLE is a server of pictures above.

XP: Invoicing mechanisms are relatively easy to set up for professional customers (who may subscribe), but for the general public, do you have in Belgium comparable solutions to the French "Minitel kiosks" where the service is charged on the user phone bill and the operator (France Telecom) pays the provider? Otherwise, how will you manage that issue?

ML: What is certain is that the thumbnails will be accessible to everyone for free. As for the rest, the project will test the existing solutions and innovate if necessary (Belgacom is partner). Another problem is the sharing ratio of the profits generated by the sale of the pictures. The interest of our syndicate is the association of public and private partners who want to address both the consumer market and the professional market. The protection of the picture will be insured by the very efficient "WaterMarking" technique developed by the University.

XP: Are you looking for international partners? Could you tell our readers who they can contact if they want to learn more about EOLE?

ML: Although the opening of EOLE to outside partners will only start in the second phase, we are very interested in everything happening or planned in this domain. One is never alone on the Web! For further information, please contact Michel Lefftz (leftz@arkm.ucl.ac.be) or Bernard Van den Driessche (vdd@arke.ucl.ac.be) or write to them at Musée de Louvain-la-Neuve, Place Blaise Pascal 1, B - 1348 LOUVAIN-LA-NEUVE, Belgium, Phone (32+) 10 47 48 41 - Fax (32+) 10 47 24 13

Reports

* Commission of the European Community, **Green Paper: Copyright and Related Rights in an Information Society** (Brussels, July 19, 1995) COM(95) 382 final, 91pp.

The EU position on the implications of digital information for copyright is grounded in the premise that a successful information society must have new products and services and that these in turn will only thrive within a coherent national, EU, and international regulatory framework, as laid out in the Bangemann report in June 1994. The authors of this Green Paper add that creative efforts will only attract investment if they are "adequately protected by copyright and related rights in the digital environment" and therefore the Community must locate specific areas in which current protections are inadequate and remedy these. In the first chapter of this report, the authors describe how they envision an "Information Society" should function; in the second they address nine issues which should be given priority in policy formulation including reproduction rights, the concept of "public" in the right to communication to the

public, the difference between digital dissemination and digital broadcasting, and how best to develop systems for administration of rights and technical protection. The report invites comment and debate around specific questions in each section and in its conclusions. Comments can be sent to: E4@DG15.cec.be.

The paper raises numerous issues and discusses each succinctly. It ends each of many sections with a series of exceptionally useful leading questions. In one respect, I found the perspective of the position paper especially interesting because it raised a kind of question we have not discussed in North America. Early in the framework, the authors state that "heavy use is made of the European cultural heritage in order to create products and services to be provided via the information superhighway. In addition to its intrinsic worth, culture has an economic value which makes it subject to market forces. It is therefore necessary for the economic recovery to benefit the cultural sector of the Community." In a subsequent point, they state, "It is absolutely necessary to find the right balance between protection of the European cultural heritage and intellectual property law, and its

exploitaton in economically workable conditions, in order to ensure that the information society and European culture develop in harmony." These views lead directly to one of the "Preliminary General Questions" posed by the report: "Does the creation of multimedia products based on clements of the cultural heritage mean that specific new legislative provision, taking account of the necessity of protecting the cultural heritage, is needed? If so, what provision?"

* Information Infrastructure Task Force, **Intellectual Property and the National Information Infrastructure: The Report of the Working Group on Intellectual Property Rights** (Bruce A. Lehman, Chair) (Washington DC, September 1995) 238pp. plus appendices. [Individual copies available free from: "Intellectual Property and the NII," c/o Terri A. Southwick, Officer of Legislative and International Affairs, U.S. Patent and Trademark Office, Box 4, Washington DC 20231 or by gopher from iitf.doc.gov.]

The long awaited revision of the infamous "Green Paper" of the fall of 1994 made its appearance early in September to a hail of

criticism and equally loud approval. What does it say? Well, actually, it's not very radical after all the hullabaloo. It does recommend that transmission be recognized as a method of distribution and that the right to transmission of works to the public be therefore exclusively reserved to the copyright holder. The same limitations imposed on importing copies of works on traditional media are imposed on transmissions and it is recognized that performances can be transmitted without being "broadcast." Specific copying rights are suggested for libraries which allow for creation of copies for preservation purposes and the making of up to three copies as long as only one is in use at a time. In addition the report recommends allowing the creation of copies for the visually impaired without limit as long as the copyright owner has not entered the market to supply such copies within the first year after publication. Finally the report recommends extending criminal penalties to those who copy systematically but without profit motive, thereby filling a lacunae in the law that has become troublesome with the advent of virtually free copying facilities in cyberspace, and it recommends allowing for technological means of protection. Finally the report

recommends strict management of copyright registration information and penalties for its falsification. In all these areas, it seems to me, the report finds a middle ground between extreme fair use and extreme market positions and is modest in making changes except as absolutely necessary. I would hope these recommendations will soon be enacted into law.

- * Meridian International Institute, Parliamentary Centre, **Canada in a World of Rapid Change: Future Choices and Consequences**

This abbreviated version of the book-length report *Changing Maps: Governing in a World of Rapid Change* (Carleton University Press, 1995; available outside Canada from Oxford University Press), presents four scenarios or alternative futures based on different assumptions about Canada, the world, and information technology changes as a framework for policy debate. The scenarios, built from a 2x2 matrix of social consensus/social fragmentation and economic boom/low growth, are described in form in the brochure and discussed briefly and suggestively (in French & English.)

- * Judi Moline & Steve Otto, National Institute of Standards and Technology, **A User**

Study: Informational Needs of Remote National Archives and Records Administration Customers Special Publication 500-221 (Washington, DC: NIST, 1995).

- * Judi Moline & Steve Otto, National Institute of Standards and Technology, **Electronic Access: Blueprint for the National Archives and Records Administration** Special Publication 500-227 (Washington, DC: NIST, 1995).

These two reports summarize the findings of a contract given by NARA to the National Institute of Standards and Technology in response to funding provided through the advocacy of Nebraska Senator J. Robert Kerrey to provide public access to NARA holdings and make some concrete recommendations to the Archives about its future IT strategies. The obvious first question was (and even after these reports still is) what does the public want to know?

The User Study attempted to answer the question by interviewing, public meetings and questionnaires administered in Nebraska in the spring of 1994. What they discovered was that people want access to government information, and particularly to information about what

information NARA has, and they want electronic access by subjects and events, personal names and titles, place names, and geographic areas. Except that they want a simple user interface, the study did not illuminate much about what records people really wanted or what they were likely to do with them. At town meetings throughout the state, people volunteered topics they would be interested in, but it is likely from the context that if the ability to search the National Archives on these topics existed, most would not do so -- they were being polite.

So what can be said about the Blueprint if it is based on relatively superficial survey data and misleading customer analysis? The first section of this report documents NARA's huge holdings, minimal IT capacity, and limited finding aids system. The second section identifies the basic needs of potential customers for a comprehensive user friendly finding aid and direct online ordering and downloading services. It pretends to tell us something about access points, but in fact Nebraskans wanted access by all the means proposed to them on the questionnaires they completed. Since Nebraskans wanted access to everything, no real priorities came out of the study, so the researchers

recommend digitizing items that have traditionally received high use, have intrinsic value, are felt to be of great importance, etc.

The third section of the report recommends development of a system to serve this data over existing gopher and WWW facilities and the capture of finding aids and documents in full-text/image based on NARA-driven priorities with the apparent object of creating a database from which a large body of future queries would be supported. Tactically, it would seem that making retrieval mechanisms (hardly finding aids!) available and digitizing on demand would be a much better way of satisfying real needs. Partners in this effort could be found in commercial and educational sectors. Some of the recommendations are at odds with approaches being taken by others (such as recommending against OCR because of the low level of accuracy and the "need" to correct - what need? why correct? retrieval studies with fuzzy logic are getting quite good results). Others assume NARA has the ability to carry out the plans it has for finding aids such as AIS/RAIS which, in fact, appear unlikely to deliver access even to archivists, to say nothing of the public.

The fourth section details a computer hardware architecture (without a putative software functionality!) and the last three sections spell out the costs, methods of funding, and prototypes that would be next steps in the recommended architecture.

Assuming that we want the American public to have electronic access to the National Archives, is this the best way to go about it? Why not invite commercial interests that might provide such services to a series of brainstorming meetings at which incentives for providing access to the public are discussed. Have them conduct the user studies, suggest the priorities, build the prototypes, test the markets and supply the access while NARA benefits from the research, gets the use of more functional retrieval tools, and serves the American public without getting in the way of its primary mission which is to ensure the accountability of government through documentary evidence? Some aspects of the two volumes suggest that the real intention was to expend the Kerrey money and provide a rationale for getting some more with the result that we have not a strategic program, but just another project.

* Research Libraries Group, RLG Digital Image Access Project, **Proceedings of a Symposium held March 31-April 1, 1995** edited by Patricia McClung (Mountain View CA, RLG, 1995) 104pp., \$20 plus handling

The workshop which is reported in this valuable publication was described in a previous issue of this journal, but having the texts of the papers and summaries of the discussions is a great benefit to the field. There is no print substitute for seeing the dramatic examples in James Rielly's paper on technical choices in digital imaging, but the thumbnails reproduced in the report are reminders of the quality distinctions he demonstrated and discusses in his paper.

* **Connecting the Nation: Classrooms, Libraries and Health Care Organizations in the Information Age.** June 1995 Update (Washington, DC, US Dept. of Commerce, NTIA-OTIA: 1995).

Connecting every classroom, library, hospital and clinic to the NII has been a priority for the Clinton Administration since its inception. This report is a status report/update on progress towards that goal. What it shows is that while 35 percent of schools have

access to the Internet, only 3 percent of classrooms are connected. More surprisingly, only 21 percent of libraries and 23 percent of hospitals are connected. (Obviously the goals of simple connectivity are far from being met and the pace of connection is slower than the administration had hoped. In addition to providing a wealth of statistical data, the report describes ways in which local communities have become more connected and tells success stories to inspire the unconverted.

* Commission on Preservation and Access, **Magnetic Tape Storage and Handling: A Guide for Libraries and Archives** by John W. C. Van Bogart (Washington, DC, CPA and National Media Lab: June 1995). 34pp.

This technical report is the most definitive statement on the subject that anyone will find today, so if the issue is a matter of concern - get it.

Books & Articles

* Howard Besser and Jennifer Trant, **Introduction to Imaging: Issues in Constructing an Image Database** (Santa Monica, CA, Getty Art History

Information Program: 1995). 48pp.

In this brief, non-technical brochure, the authors tackle complex and highly technical issues regarding digital image bases and take their readers through a step-by-step decomposition of the language of digital imaging. They systematically expose the decision points that anyone planning a digital image database will confront and in their lucid, but not over-simplified discussion, provide the basic knowledge that is necessary to understand the trade-offs and benefits of different approaches. This (free from the Imaging Initiative, Getty AHIP) brochure is strongly recommended to beginners and experienced alike.

* Judy Diamond, Alan Bond, Beth Schenker, Debra Meier, and Dana Twersky, "Collaborative Multimedia," *Curator*, vol.38#3, pp.137-149.

The authors describe a multi-institutional cooperative project to construct an interactive multimedia program that explains the work of paleontologists and provides details of finds located at the member museums. The organizational framework in which the project took place is more innovative than the multimedia product, but the latter

has some elements that can be learned from as well.

- * John Strand, "High Art, High Tech: The National Gallery of Art's New Micro Gallery," *Museum News* (July/August 1995), pp.35-39.

Although it doesn't open until late October, the NGA's Micro Gallery, designed by Cognitive Applications which was responsible for the London and San Diego Micro Galleries, has received favorable press in many journals. This article provides a taste through some color photographs and a discussion of some of the aims of the project.

- * David Bearman, editor, **Hands On: Hypermedia and Interactivity in Museums** (Pittsburgh, Archives & Museum Informatics, 1995) 293pp. and **Multimedia Computing and Museums** (Pittsburgh, Archives & Museum Informatics, 1995) 388pp. \$50 each; \$85 for two volumes.

These two volumes, each of which contains selected papers from the Third International Conference on Hypermedia and Interactivity in Museums, provide a complete record of that conference between them. They are divided between articles

addressing concerns of museum managers -- delivery mechanisms, collaborations and partnerships, and intellectual property ("Hands-On") -- and articles concerned with museum applications and technology issues such as audience analysis, program design, intellectual access methods, and data standards ("Multimedia Computing").

- * P.G.B. Ensor and C.G. McGregor, **Analysis of Visual Information Retrieval Queries**. British Library R&D Report 6104, London, The British Library, 1993.

This analysis of the queries actually posed to one of the largest image collections in the world, the Hulton Deutsch Collection Ltd., evaluates two different finding aids -- a subject header index and a thesaural tool -- and examines the intrinsic nature of a broad range of queries put to the collection. Since we know so little about retrieving images based on text given by searchers, the study will be of help despite its limitations.

- * George Philip, D. Crookes, and Z. Juhasz, **Development and Implementation of an Online Photographic Database using a Network of Transputers**, British Library R&D Report

#6161 (London, The British Library, 1994).

The problem of storing and searching massive imagebases is nearly upon us, so this research on the potential of a massively distributed (transputer or VLSI chip-based) system for performing both functions is timely. In addition, the results are quite promising and further research issues are clearly identified.

- * Barbara Zimmerman, "Piecing Together a Puzzle: Rights Clearances for Multimedia," **CD-ROM Professional** (October 1995), pp.31-44.

This article, along with several others in the issue, provides an excellent practical guide to the ins and outs of rights clearance for multimedia. The recommendation the author makes about up front planning and defining markets also will have value to anyone trying to estimate costs or make income projections for publications or online services.

- * Luciana Duranti and Terry Eastwood, "Protecting Electronic Evidence: A Progress Report on a Research Study and Its Methodology," **Archivi & Computer: Automazione e Beni Culturali**, vol.5#3 (1995), pp.213-250.

As far as I'm aware, this is the first published report of the University of British Columbia study led by the authors with funding from the Social Sciences and Humanities Research Council of Canada (SSHRC). Some of the information it contains has been circulating in draft form this year, but it is good to have it brought together, along with the preliminary results of some collaborative modeling which the project has done with the DOD Records Management Task Force. This article appeared just as the spring issue of *Archivaria* with Luciana Duranti's complementary piece on "Reliability and Authenticity" was received.

- * Ann Bishop and Joseph Semper **Artist on the Internet** (abishop@uiuc.edu)

This paper reports on the nature and use of three different types of virtual art galleries that have been established at the University of Illinois, and explores the impact of networked art on museums, artists, and consumers. The Krannert Art Museum has produced a gallery guide on the World Wide Web, allowing virtual tours of parts of its collection. Joseph Squier and several of his colleagues have developed "@art gallery," a Web site where internationally known

artists display original digital works on a revolving basis, with each artist's work being showcased for a period of six to eight weeks and then archived. Squier exhibits his own art works via "the place," where he goes beyond the imitation of the linear, static display of individual images and text to produce a new artistic format for works that exist only in their Web manifestations. Jim Ure, in a review of "the place" appearing in *HotWired* (the online outgrowth of *Wired* magazine), calls Squier's work "a gripping document that could be described as an image-narrative, or a digital photo-essay" and "reveals the potential of the Web as a medium, and not just a showcase, for artistic achievement."

The authors are currently collecting data on the use and impact of these three different kinds of virtual galleries through interviews with their creators (both artists and museum personnel) and surveys of their patrons. Extent of use is also being measured by capturing data associated with each visit to the online sites. This paper reports their findings and draws conclusions about the impacts of the GII in the realm of art on individuals, organizations, and society.

* Tom Blanton, **White House E-Mail: The Top Secret Computer Messages the Reagan/Bush White House Tried to Destroy** (New York, The New Press/Washington DC, The National Security Archive, 1995)

This popular paperback release of almost five hundred of the hundreds of thousands of electronic mail exchanges wrested from the government in the Profs case illustrates the range of contents of the White House e-mail system. Serious matters of state and frivolous personal jokes co-existed in the communications system, but enough insight can be had into the way the government worked (and subverted) to make it a fascinating story. The accompanying disk version of the email in ASCII doesn't add anything except a warning about why electronic records are not simply the content of the screen dump.

* Australian Society of Archivists, **Debates and Discourses: Selected Australian Writings on Archival Theory, 1951-1990**, Peter Biskup, Kathryn Dan, Colleen McEwen, Greg O'Shea, and Graeme Powell eds. (Canberra, ASA, 1995) AU\$25

This compilation of the seminal articles which shaped the

Australian archival profession provides most non-Australian professionals with their first opportunity to read Ian Maclean, Peter Scott, Robert Sharman, and their many colleagues as they framed a distinctly antipodean archival theory. Most of these ideas were formed, and published, within Australia and were not widely discussed outside the continent before 1990. Since then, Australian archival thinking has burst full blown on the world in Keeping Archives, Archival Documents, The Records Continuum, and other influential books as well as through articles by occasional visitors like myself. This volume ably collects the most important pieces of the puzzle and presents them in the chronology of their original publication. The only piece not by a professional is also the first article, the only article published prior to 1959 and the only article not published in a professional journal or book; while interesting in its own right, it feels out of place and without it the volume would comfortably cover the thirty year flowering of Australian theory.

* **Information: The Hidden Resource. Museums and the Internet.** Proceedings of the Seventh International Conference of the MDA, 1995, Anne Fahy

and Wendy Sudbury eds. (Cambridge, Museum Documentation Association, 1995) 424pp.+ append.

These proceedings of the fall conference of the Museum Documentation Association are somewhat uneven in quality and depth, but the best of the papers, and there are numerous, make the volume well worth acquiring. I introduce the volume with reflections on what institutional strategies will enable museums to thrive in a networked world. Peter Samis breaks new ground in interpretation. Ed Southworth reports on the most exciting experiment in use of museum documentation by a researcher that has yet found its way to press. Two articles from Germany on the technology and social implications of 3-D modeling (one by Lothar Paul, one by Alexander Geschke and Jurgen Mrosek) are cogent and cautious but provide many answers to the economic and cultural issues raised by 3-D. Christopher Yapp on "Education" and the implications of technology provides sign posts for museums of the future. The reader will, of course, find tidbits of interest in other articles as well.

Periodicals

- * **EJOURNAL: An Electronic Journal** concerned with the implications of electronic networks and texts

This exceptionally interesting journal has been published since March 1991. It is edited by Ted Jennings who has been able to elicit a regular stream of excellent articles written in generalist language about social, economic, intellectual, cultural, and political implications of the electronic word and its networked dissemination. To scan the contents, send an e-mail message to LISTSERV@ALBANY.EDU with the message GET EJRNL CONTENTS and you will receive a file of the table of contents of back issues together with instructions on receiving back issues.

- * **Library of Congress Information Bulletin**, vol.54#12 (June 12, 1995).

This special issue of the **LC Information Bulletin** is devoted exclusively to the National Digital Library Program and describes various aspects of the research and implementation of that program in considerable depth along with detailing LC's efforts to communicate with the public over the Internet.

- * **Visual Resources Bulletin**, vol. 22 #2 (Summer 1995).

This issue contains the Proceedings of the 1995 VRA conference which describe numerous projects in digital imaging and the issues they are encountering.

Ephemera

- * National Film Preservation Board of the Library of Congress, **National Film Preservation Plan: An Implementation Strategy** (Washington DC, Library of Congress, June 1995) 12pp.

This report celebrates the progress made nationally in film preservation over the last decade (largely as a consequence of the growing economic value of old films to the studios). This study follows the path set out in **Film Preservation 1993** which was mandated by the National Film Preservation Act of 1992 and the national plan **Redefining Film Preservation** (1994), and is intended as an implementation of that plan. The premise is that the government and the film industry should enter into a "covenant" whose tenets are that the studios must preserve their film, copyright must be respected (sometimes this

will involve "repatriation" of originals from foreign archives), and that transfers should be made to new film. It also argues that funding should be increased from public and private sources, and public outreach should be engendered. The paper then recommends a 30-point action plan with goals, participants, and strategies identified for each action.

- * **G7 Information Society: Pilot Projects - Progress Report** (Released on the Occasion of the G7 Summit, 15-17 June 1995, Halifax Nova Scotia, Canada) 42pp.

This report consists of updates on the progress of each of 11 pilot projects agreed to at the ministerial meeting of the G7 in Brussels in February 1995. The *Biblioteca Universalis* (Electronic Library) and *Multimedia Access to World Cultural Heritage* (Museums and Heritage) projects of most interest to readers of this journal provided only very brief reports. For further information regarding the library project contact: Dominique Arot (France) +33-1-40.15.74.53 and for the museums project contact Puri Purini (Italy) +39-6-323-5951

- * **Managing Information as Records**. Strategic Plan - 2003 (July 28, 1995, DOD Records

Management Task Force) and Department of Defense Records Management Task Force, **Semi-Annual Report** July 3, 1995.

These two short documents report on a major DOD project which ought to have been called "Managing Records as Information" rather than "Managing Information as Records." Its purpose is to improve records management in DOD and provide access to the contents of records as needed by DOD personnel throughout the world. To date it has focussed primarily on automating records management processes and document management issues but seems poised to tackle the creation of reliable electronic records, which would be a major contribution to US government practices and, potentially, policies. The effort is currently headed by Ken Thibodeau, on leave from his position as Director of the Center for Electronic Records at the National Archives.

- * **Baseline Requirements for DOD Records Management Application Software**, Army Research Laboratory Software Technology Branch (AIAI TR 95-03).

This very confused document will, unfortunately, probably

guide the DOD procurement of an electronic records management system which is perceived as something distinct from the record creation environment and has the functionality of a traditional records manager.

* Robin Thorne, Getty Trust Art History Information Program, **Protecting Cultural Objects** (Santa Monica, Getty AHIP, 1995) 52p.

This handsomely produced pamphlet is a brief report on a project to define a minimum data standard for the protection of cultural properties. Specifically it reports on the first phase of that project in which organizations with an interest in such standards (police, documentation centers, and museums and galleries) were surveyed to identify their current documentation practices and determine what elements of information they regarded as essential to a minimum data set [The report is also available over the World Wide Web at <http://www.ahip.getty.edu/ahip/home.html>.]

* **Functional Baseline Requirements and Data Elements for Records Management Application Software** by Capt. Daryll Prescott, William Underwood and LTC

Mark Kindl, Army Research Laboratory, Software Technology Branch, August 28, 1995, typescript 19pp.

This paper extends the previous report to the specification of data elements. A few of the "new" elements, added since the last draft, move towards making the records captured by this application satisfy the functional requirements for evidence, and the data items are all tied nicely to the previously accepted higher level requirements, but the overall dictionary still lacks a coherence since those higher level requirements never made much sense. There is a lot of promise in the top down methodology however if the Army gets its requirements right.

Announced Publications

The Library of Congress has announced the publication of **America Preserved: A Checklist of Historic Buildings, Structures and Sites** which lists more than 30,000 structures and sites documented by the National Park Service through its Historic American Buildings Survey and the Historical American Engineering Record almost doubling the entries in the out-of-print 1983 volume. The volume

consists of 1184 pages and sells for \$74. To order, call 1-800-255-3666 (US only) or 1-202-707-6100, [cgsinfo@mail.loc.gov](mailto:cdsinfo@mail.loc.gov)

Chadwyck-Healey Inc. has announced the publication of **Archives USA** which contains all the volumes of NUCMC, indexes to the complete National Inventory of Documentary Sources (52,000 finding aids from over 300 repositories on microfilm), and directory information on 4,200 archival repositories in the US. [For inquires and orders in the US call 1800-752-0515 or contact mktg@chadwyck.com; outside

the US call +44-1223-215-512 or contact mktg@chadwyck.com.uk]

The Museum Association (UK) announced the publication of **Museum Practice**, a journal to appear three times a year from 1996. Each 80-page issue is intended to address a range of practical subjects and contain reviews and reports on museum and gallery projects, publications, events, research and products in the UK and abroad. [100 pounds sterling pa., Museums Association, 42 Clerkenwell Close, London EC1R 0PA, tel +44-171-250-1834; fax +44-171-250-1929]

New Strategy for NARA

John W. Carlin, the newly appointed Archivist of the United States, lost little time in making known to his staff that NARA was going to pursue a substantially altered course under his stewardship. At the end of August, less than two months after his appointment, he issued the following statement:

Strategic Directions for the National Archives and Records Administration**Vision**

The National Archives is not a dusty hoard of ancient history. It is a public trust on which our democracy depends. It enables people to inspect for themselves the record of what government has done. It enables officials and agencies to review their actions and helps citizens to hold them accountable. It ensures continuing access to essential evidence that documents

- the rights of American citizens;
- the actions of federal officials; and
- the national experience.

To be effective, we at NARA must do the following:

- determine what evidence is essential for such documentation;
- ensure that government creates such evidence;
- make it easy for users to access that evidence regardless of where it is, where they are, for as long as needed;
- find technologies, techniques, and partners world-wide that can help improve service and hold down cost; and
- help staff members continuously expand their capability to make the changes necessary to realize the vision

Mission

NARA ensures, for the Citizen and the Public Servant, for the President and the Congress and the Courts, ready access to essential evidence.

Values

To succeed in our mission, all of us within NARA need to value the following:

- risk-taking: experiment, take chances, try new ways, learn from mistakes, be open to change;
- communication: propose ideas, dialogue with others, develop trust, and act openly, honestly and with integrity;
- commitment: be responsible, accountable and always willing to learn;
- loyalty: support the mission, help fellow workers, proceed as a team, and recognize that our government and our people truly need our service

Proposed World Heritage Information Network

In a working paper prepared by Peter Stott, James Paine, and Francis Golding dated 20 June 1995, the World Heritage Centre launched a proposed World Heritage Information Network to help realize the aims of Article 27 of the World Heritage Convention. The purpose of the proposed network is both to provide links between the international entities devoted to cultural heritage preservation and to make information about world heritage available to the public in compelling ways thereby

promoting awareness of cultural heritage preservation needs, issues, and activities.

Using the Internet, the agencies will try to create a distributed, multi-lingual, information service in which they and nation states that are parties to the convention are all participating actively. Guidelines in the form of style sheets, headings, and links will be provided centrally, but responsibility for maintenance is to be divided, and the content which is to be created locally will be designed to serve a variety of audiences. An experts meeting was to be held in late September to critically review the network implementation recommendations, but was apparently postponed. When held, it will address cost estimates, policies, and critical success factors, and define a strategic plan.

Proposed International Museum Information Network

Early in 1995, a number of European museums, coordinated by Dominique de Louis of Telesystemes France, began to organize an initiative that is known as IMIN, or the International Museum Information Network. As of this fall, a draft constitution

for the group has been produced and funds are being sought from the European Commission. IMIN was envisioned as a non-profit organization to deliver and provide access to cultural heritage information on behalf of its members. Its implementors hope that it will be operational by the end of 1995 and financially independent in 1997. While the "agenda" of IMIN is subject to what members want to do, the functions listed in its preliminary prospectus are:

- serve as a focal point for information on the use of Telecommunications and related Information Technology
- represent its members as required or requested
- serve as a help desk for users and information providers
- monitor technical developments, requirements of users and providers of (remotely accessed) information, and development and use of standards
- dissemination of information
- offer/recommend copyright and access control
- offer/negotiate package deals for mass-digitization
- offer/negotiate use and acquisition of remote access applications

- offer to negotiate with telecoms and VAS operators, information brokers, publishers, etc.
- stimulate cooperation between information providers

While I'm skeptically open-minded about the effort, you might want to explore it further by contacting IMIN, Museum, Stadhouderslaan 41, 2517 HV Den Haag, The Netherlands.

Getty AHIP Sponsors "Research Agenda" Discussion

The Getty Art History Information program has been examining areas of research that have the potential to improve our ability to create and use arts and humanities information over networks. Based on recommendations from information technology specialists, AHIP staff identified eight research domains vital to the field and commissioned papers on them by leading experts. The major points made in each paper were outlined in an overview and the issues these authors have raised and left unresolved were highlighted for further discussion on an open list that was maintained from October 2 - November 17. Over five hundred individuals subscribed to the list. The discussions will be summarized

and reported to foundations and federal funders in 1996.

The papers which fueled the discussions were:

- * Overview and Discussion Points by David Bearman, Archives & Museum Informatics
- * Tools for Creating and Exploiting Content by Robert Kolker and Ben Schneiderman, University of Maryland
- * Knowledge Representation by Susan Hockey, Rutgers and Princeton Universities
- * Resource Search and Discovery by Gary Marchionini, University of Maryland
- * Conversion of Traditional Data Formats into Digital Media by Anne Kenney, Cornell University
- * Image and Multimedia Retrieval by Donna Romer, Eastman Kodak
- * Learning and Teaching by Janet Murray, MIT
- * Archiving and Authenticity by David Bearman, Archives & Museum Informatics
- * New Social and Economic Mechanisms to Encourage Access by John Garrett, Corporation for National Research Initiatives
- * An archive of the documents and discussions may be found at <http://www.ahip.getty.edu/agenda/home.html>

Getty CEA Web Site

The Getty Center for Education in the Arts launched a World Wide Web site for arts educators on September 25. The site promised a "wealth of materials" to be used in arts education, a 24-hour a day year round conference, and a gateway between arts educators and the 40 million Internet users. The Getty Center published a nice brochure to introduce arts educators to the Web - it will be interesting to track the uptake.

MUSEUM-ED is an open discussion list for museum educators that has just been launched with the help of the Minneapolis Telecommunications Network by Kris Wetterlund, Director of Education for the Minnesota Museum of American Art. To subscribe, send an e-mail to LISTPROC@MTN.ORG with the message `Subscribe Museum-Ed<your name>`.

US National Archives Annual Report goes Popular

In its format and content, the annual report of NARA was transformed for 1994 (it still comes out very late!). In Part II of the report, entitled "A National

Electronic Link to the Archives," the text announces that "The coming National Information Superhighway presents the National Archives with unprecedented opportunities. By the end of the decade, people in their offices, schools, and homes throughout the United States should be able to connect electronically with the National Archives." Of course the question is what information and services they might have when they do: these are then discussed, beginning with current services, then discussing GILS, automated research tools, and experiments with students using original documents in their research.

High Density CD

"Four sets of encyclopedias could fit on an inch-long steel pin using a new information storage technique invented at Los Alamos National Laboratory," according to a recent press release. The High-Density Read-Only Memory, or HD-ROM, uses a unique ion beam to inscribe information on pins of stainless steel, iridium or other materials that are built to last. An HD-ROM holds about 180 times more information than a comparably sized Compact Disc Read-Only Memory, or CD-

ROM, today's cheapest data storage medium.

For more information, contact Jim Danneskiold of Los Alamos National Laboratory at 505/667-1640, 667-7000 or <slinger@lanl.gov>. Copyright 1995 HPCwire. To receive the weekly HPCwire at no charge, send e-mail without text to "trial@hpcwire.tgc.com".

ARL-ACLS Copyright Initiatives

The Association of Research Libraries (ARL) and the American Council of Learned Societies (ACLS) have launched an initiative to promote copyright awareness within North American higher education and research communities. In an open letter, the leadership of ARL and ACLS call on colleagues throughout the scholarly community to come together to revisit the goals and purposes of copyright and "contribute to efforts that seek an understanding of copyright in an electronic environment." The ARL-ACLS letter is accompanied by a new publication, "Copyright, Public Policy and the Scholarly Community" containing five perspectives on the future of copyright in the electronic environment which is intended to

stimulate discussions within educational institutions and scholarly societies. In a related development, ARL announced a Copyright Awareness Leadership Workshop for directors and librarians in academic research institutions. [For further information, contact Patricia Brennan, ARL Information Services Coordinator, patricia@cni.org).

Late Breaking News: Presidential Records Act Upheld

On December 15, U.S. Archivist John Carlin announced that the administration had decided not to appeal the Federal Court ruling that had voided an

agreement struck between George Bush and then Archivists Don Wilson in the final hours of the Bush administration. The notorious agreement, which had given Bush control of his records, was overturned by Judge Charles Richey in February as a violation of the Presidential Records Act, but until this announcement the government had insisted that the agreement was legal and planned to appeal the case. The Justice Department gave no reason for its change of position but Carlin was generally viewed as having been instrumental in part because he wanted to put the controversies over electronic records of previous administrations behind him so that the agency could move on.

SOFTWARE NOTES

Electronic Evidence Experts

Computer Forensics, Inc. [501 East Pine, 3rd. fl., Seattle WA 98122; 206-324-6232] describes itself using the terms "electronic evidence experts," and has two areas of business: electronic records management and electronic media discovery. Working inside your firm, it helps protect you from discovery that might be embarrassing; working outside it helps to uncover the electronic records you'd rather not have found. It's an interesting niche market!

Software Directory

The Canadian Heritage Information Network (CHIN) will offer an up-to-date directory of museum collections management systems together with comparative analysis of their functional capabilities on subscription from 1996 forward. CHIN and its clients have built this database this fall as part of a procurement process that will ultimately lead to all CHIN members acquiring commercially available collections systems. Each vendors' product has been analyzed on numerous dimensions by the CHIN team and the

database will be kept up to date so that each member institution, as it becomes ready to make a software procurement decision over the next three years, will have the best and latest assessment of all the products in the market.

In anticipation of the value of this on-line subscription product to the customers of the *Directory of Software for Archives and Museums* which Archives & Museum Informatics has published since 1989, we will not publish a 1996/97 Directory. Instead we will refer customers to the CHIN subscription service and recommend that they acquire this database through CHIN. I recognize that some archives and records management systems previously listed in our directory would not qualify for the CHIN listing, but on the whole feel that the added value of the depth of analysis provided through CHIN more than makes up for its more limited breadth.

It's probably time to admit, frankly, that the archives and records management software market is such a disaster that not having a directory to its products might be a service to the community. For years we've waited for some company with reasonable depth of support and an

understanding of archives to come along to build products that would do more than record surrogate collection level cataloging records and retrieve them or a records management system that could do more than locate files within boxes within shelves on the floor. Needless to say it hasn't happened because (1) archivists have been unable to articulate a coherent functional requirement; (2) the Archival Information Architecture

group dissolved without agreement; and (3) the RLG AMIS system funding was halted in the early 1990's, just as efforts to get states to cooperate in a common specification fell apart in the early 1980's. It also hasn't happened because archives spend almost nothing on software so no commercial firm with an understanding of the situation would enter a market with such limited economic potential.

NARA Issues New Rules on Electronic Records

In new rules dated August 14, 1995, US National Archivist John Carlin signaled a shift in Federal policy on electronic records that was adequate to convince the US District Court to consider NARA to be compliant with its orders under *Armstrong vs. the Executive Office of the President*. The rules, formally published in the *Federal Register* as 36 CFR Parts 1220, 1222, 1228 and 1234, apply to "management of Federal records created or received on electronic mail (e-mail) systems." They became effective 30 days after publication as a consequence of prior notice of rulemaking published March 24, 1994, for which NARA received 92 comments (approximately 1500 pages) that are summarized in the *Federal Register* notice.

In my view, the new rules represent an improvement over the situation from the past several years in which NARA provided no guidance at all or proposed that agencies print records to paper. The weaknesses of the new regulations are three-fold. First, they persist in NARA's determination that one must distinguish between record and non-record e-mail and perpetuate the confusion that the contents of communications need to be judged to determine if they are records. Second, they fail to define *recordkeeping systems* which is the critical new concept introduced into the picture, and the one upon which the ultimate value of the regulations rests. And third, they fail to suggest a framework for implementation that would allow agencies to retain records electronically (although they urge the benefits of electronic recordkeeping).

Let me take these problems in sequence, because they each are crucial.

One of the continuing problems that NARA has created for itself in thinking about electronic records is that it tries to distinguish up front

between "record" and "non-record" material. Because there are no automated ways to do this, they find themselves in a serious quandry: either they have to permit the records creator to make this distinction or they (or some records manager, somewhere) need to review each record. The latter is too costly and the former results in a system that cannot satisfy the tenets of accountability because it allows records creators to make decisions about which transaction to document. Ostensibly the purpose is to eliminate redundant copies (even though each copy going to a different recipient is in fact a different transaction) and eliminate personal messages from official mail files. To solve this second problem it would be easier to warn people that their "private" e-mail will be retained for a period of time. If employees object, they shouldn't use government computers and networks for private purposes. This is the approach taken by most private industry and conforms to the guidance given Federal employees about the use of mail and the phone.

If NARA resolved its self-made problem with record and non-record, the guidance to copy all electronic mail from electronic mail systems to "recordkeeping" systems would be reasonable protection for Federal records. Or it would be, if recordkeeping systems are what I think they are. But NARA has failed to define its terms meaningfully. The changes do add a new definition for recordkeeping system ("a manual or automated system in which records are collected, organized, and categorized to facilitate their preservation, retrieval, use, and disposition) but without any functional requirements that such a system must satisfy, this definition doesn't ensure that transferring records to a recordkeeping system is any better than leaving records in the information system that created them. Given that the entry for "Recordkeeping System" in NARA's latest *Federal Records Management Glossary* (1993) says "see filing system" and the definition given for filing system is "a set of policies and procedures for organizing and identifying files or documents to speed their retrieval, use and disposition," the confusion is not too surprising. In the NARA series of instructional guides for managing cartographic records (1989), audiovisual records (1990), electronic records (1990), and personal papers of Executive branch Officials (1992), there are no definitions of recordkeeping systems.

When I wrote about "Recordkeeping Systems" in *Archivaria* (Autumn 1993, #36: p.16-36), I documented that there was virtually no use of the term in the professional literature in the previous fifty years. Since then, in my work and that of the University of Pittsburgh electronic records project, I have consistently equated recordkeeping systems with systems that satisfy the functional requirements for recordkeeping as articulated in dozens of published and unpublished project reports. Of course, if this is what NARA means by recordkeeping systems, and we can depend on records to be transferred to systems that satisfy the functional requirements for evidence as articulated by the University of Pittsburgh project, I have absolutely no problem with this aspect of the new regulations. But what do they mean? And why aren't they explicit?

Finally, NARA doesn't seem to have any idea of how agencies should go about making sure the records created by their information systems end up in recordkeeping systems. They haven't adopted the concept of "Business Acceptable Communications" or standards for how records should be transmitted so they can't provide an architecture-based solution that will satisfy agencies. Nor have they yet provided guidance about how to use existing products in ways that would contribute to trustworthy recordkeeping and ensure the retention of evidence.

In the end, NARA produced a set of rules that satisfied Judge Richey that the government had, in fact, finally produced guidance, but these rules don't satisfy the larger purpose of ensuring better electronic recordkeeping by agencies nor will they, I fear, keep NARA out of court with future suits to protect government electronic mail from arbitrary destruction. Ultimately they fail NARA in a more important way: by not adopting a standard for electronic communication envelopes, NARA will have to inherit all the different recordkeeping systems of all the various government agencies decades from now when it will have no facilities for managing their hardware and software dependencies.

Records Schedule 20: Disposition of Electronic Records

The National Archives also issued a new General Records Schedule (GRS) for electronic records on August 20. The problems with the GRS are also fundamental: General Records Schedules are used to give blanket authority to dispose of certain categories of commonly created

records by the activity that created them. In this case, the category electronic records (which applies here to lots of records which are on paper, or even microfilm, and aren't at all "electronic" except that they were generated by printers driven by computers) is not a category that relates to a business function of the government. As a consequence, the blanket authority to dispose of certain records sits quite uncomfortably. In addition, the records authorized for disposal by NARA are often precisely the kinds of records about the system which are required to document the authenticity and reliability of records being kept for archival evidence. Since NARA has defined the "contextual" and "structural" metadata requirements for records as being nothing more than "transmission data" (the examples used by Judge Richey in the Profs case) they are not retaining the documentation necessary to give evidential value to what remains.

For example, the GRS specifically identifies tests of systems performance, log-in files, passwords, audit trails, disclosure extracts, pre-migration files, indexes, and old documentation from prior states of the system as disposable, but all these kinds of structural metadata are crucial to the evidential reconstruction of records. NARA fails to distinguish between data in machine-readable formats and electronic records (e.g., it doesn't apply tests of evidential worthiness to their information). As a consequence, it has failed to take account of the fact that "data processing" systems have changed significantly in the past decade and that this kind of documentation is precisely the kind of metadata associated with business transactions at the record level. That is crucial for understanding the context of records creation and therefore of evidence.

STANDARDS NOTES

Proposed Guidelines on Electronic Records Management

Recently several proposed guidelines on electronic records management have been circulated for comment prior to their implementation. Among those received in the past few months are exemplary policies from the State of New South Wales Australia and the State University of New York.

The New York Guidelines focus on roles and responsibilities of different employees within an organization during the life cycle of electronic text documents. They are non-technical (and only occasionally trip on technical matters), generally well grounded, and relatively easy to understand. Applying them will present most people with insurmountable difficulties however since they are short on concrete advice about how employees are to achieve the desired ends. [For copies of the guidelines, contact: Prof. Philip Eppard, School of Information Science and Policy, State University of New York, Albany; eppardp@ca.sunycentral.edu or Jane Graham 518-443-5427.]

The New South Wales guidelines (*Documenting the Future: Policy and Strategies for*

Electronic Recordkeeping in the New South Wales Public Sector) are more comprehensive. They cover all kinds of electronic records and go beyond policy to address matters of strategy and of practice. Without a doubt, this draft, authored by David Roberts and released for public comment July 1995, is the most comprehensive adaptation of recent writings on electronic records to the realm of policy guidance. Roberts incorporates the best thinking of the past two years and gives it important integrating twists to produce a compelling document. [For copies, contact David Roberts, Archives Authority of New South Wales, Level 3, 66 Harrington St., The Rocks, Sydney NSW2000, Australia; +61-2-237-0120; fax +61-2-237-0121.]

Museum Object Information

The ICOM Committee on Documentation (CIDOC) has published "International Guidelines for Museum Object Information: The CIDOC Information Categories" (June 1995) in French and English editions. [For copies contact ICOM, Maison de l'Unesco, 1 rue Moillis, 75732 Paris 15, France or

fax +33.1.43.06.78.62 or e-mail to icom@unesco.org; ftp versions are available from CHIN at <ftp://ftp.chin.gc.ca/pub/ICOM>.]

The guidelines represent the culmination of work of the CIDOC working groups on "Data & Terminology" and "Data Models." The publication details information categories, discusses and illustrates format rules and conventions governing the appearance of information in each category, and provides examples of data values with appropriate references to terminology standards. While this is not designed to be a comprehensive data definition (such as the CIDOC Data Model) it is also not a minimalist standard, but rather a fairly comprehensive listing of widely used fields with justification for their use. The rationale, articulated in the introduction, is that the information categories discussed are those required to ensure accountability for objects, aid the security of objects, provide an historical archive about objects, and support physical and intellectual access. In general, the document should help with these aims and serve its purpose as a convenient means for smaller museums to ensure their information systems are adequate.

Core Standard for Archaeological Sites and Monuments

The ICOM Committee on Documentation (CIDOC) released a draft international standard for core documentation of archaeological sites and monuments at the quadrennial meeting of ICOM in Stavanger, Norway. The 36-page ring-bound document is the result of a collaboration between the ICOM Documentation Committee and the Council of Europe's Cultural Heritage Committee. The aims of the standard are to facilitate communication in the protection of archaeological heritage, assist countries that are in the early stages of establishing record systems for archaeological heritage, and facilitate research. The sections of the standard

- (1) identify the site or monument,
- (2) locate it,
- (3) describe the type,
- (4) date it,
- (5) record physical characteristics,
- (6) provide a place to indicate protections it enjoys, and
- (7) allow a summary of its historical and/or archaeological significance.

The alphabetical listing of fields is meaningfully interpreted by the presentation of a simplified version of the CIDOC Data Model. [Available from ICOM, Maison de l'Unesco, 1 rue Moillis, 75732 Paris 15, France or fax +33.1.43.06.78.62 or e-mail to icom@unesco.org.]

Digital Videodisc (DVD)

After months of jockeying, the two major consortia proposing different digital videodisc standards (Sony/Philips and Toshiba/Time Warner) reached agreement on a single format, the specifications for which are to be published in late October. The format will allow up to 133 minutes of high quality video on a single side with backward compatibility to today's CD media. The agreement is crucial in both achieving market acceptance and moving quickly towards commercial distribution, possibly by early 1997.

MPC Level 3

The Multimedia PC Working Group of the Software Publisher's Association released its MPC3 specification on June 12, 1995. As with previous MPC specifications, the new requirements are (1) definitely minimal and (2) a major

advance on the last (MPC2) level. Test suites to ensure MPC compatibility were released in late summer. The new requirement calls for support for MPEG-1 and software implementation of video codecs, 75Mhz Pentium CPU chip, quad speed CD-ROM drive, 8 MB RAM, 540 MB hard drive, and wavetable sound. The intention of these requirements is to enable delivery of full-screen, full-motion video with enhanced CD-quality sound while the computer is engaged in running multimedia code. [For further information see <http://www.spa.org> or contact the Software Publisher's Association at 202-452-1600.]

Information Retrieval Protocol (Z39.50-1995)

The revised ANSI/NISO Information Retrieval (Z39.50): Application Service Definition and Protocol Specification, has a new ability to search multiple databases more efficiently by enabling the combination of attributes from different attribute sets within a single query, the ability to request specific portions of a document, and the ability to scan a list, sort, "explain," and use extended services. In addition, the new protocol should enable faster retrieval of a large number of

records and the use of clients using a specific human language (English, French, German, etc.) or character set during a session. The new specification is available for \$79 per copy from NISO Fulfillment, P.O. Box 338, Oxon Hill, MD 20750-0338; 301-567-9522.

Bootable CD-ROM Standard

The "El Torito" Bootable CD-ROM Format Specification, version 1.0, solves a number of problems long associated with both CDs and the DOS operating system which until now has been unable to boot from a CD. It is designed to be an industry wide, open, non-licensed standard available without charge. Access it via e-mail from the CD/OS Industry Association by a message to Baker@cdos.com or browse it at <http://www.net/cdos.html>

Archival Authority Control Standards

Late last year the International Council on Archives, Ad Hoc Commission on Descriptive Standards completed a draft "International Standard Archival Authority Records for Corporate Bodies, Persons and Families,"

which it dubbed ISAAR(CPF). Member institutions of the ICA were invited to comment. Unfortunately I did not get a copy at the time, and only received one recently just as the Commission was set to meet in Paris to consider the comments they had received. Although it is somewhat late to influence the ISAAR in a fundamental way, I nevertheless feel it is worth making some fairly basic comments.

The ISAAR(CPF) follows in the tradition of ISAD(G) in proposing what looks like a structured record for data interchange, but without any technical record structure. It defines fields that should be present in this record and rules intended to make collections of such records reasonably uniform, but in a what I can only assume is a failure of will, neglects to actually state what protocol should be used for the data interchange.

The ISAAR(CPF) also follows the ISAD(G) tradition in assuming that archivists should make very controlled (e.g., new) descriptive records and that this investment will prove worthwhile to the user community. In this case, since the subject is authority records, one would have expected some discussion of why it was believed that this approach to authority

control would prove beneficial. But alas it is not there.

There are a few valuable things about the ISAAR structure including the introduction of a field for mandate, function, and sphere of activity separate from the general organizational history in corporate authority records, but the actual definition of this field and the example given illustrate a major problem with the ISAAR as a whole: it gives no evidence of being implementable except on paper. And a paper authority control system will obviously not suit archives entering the third millennium.

Some very basic questions needed to be asked (or if asked, answered for readers) before ISAAR was launched. Most importantly, why is it necessary to specify a new structure for archival authority records for persons, families, and organizations, thereby discarding databases of these entities created by others over the last century? What is the relationship between this authority and those employed in libraries which it resembles, but differs from sufficiently to require archivists to develop a separate system? What is the relationship between this authority and entries in *Who's Who* or dictionaries of national biography or government

organization manuals? How are different data sources intended to be used together, or are we rekeying the world's knowledge of corporate bodies, families, and persons in order to get it more right for archivists?

I admit to believing, and have published my reasons for believing, that authority control does not greatly improve retrieval and that other methods of enhancing searches at less cost will produce better results. But even if I was firmly convinced of the benefits of authority control, I would be dubious of the sample entry for the inventor, industrialist, and philanthropist Alfred Nobel (1833-1896). In the structured field for "Occupation, sphere of activity" which goes on for two-and-a-half pages, the sample record never uses the term "industrialist" in reference to him and, indeed, never refers to his occupation at all after stating (in line 19) that "in 1863 Nobel became a chemist in his father's factory...." While it refers to inventions and patents, the entry never uses the term "inventor" for Nobel. While discussing the arrangements for his estate, the record never uses the term "philanthropist."

The ISAAR goes out if its way to impose conformity on the

authority records structures for organizations, families, and persons, but what are we to make of a field called "Legal status" which in one entry reads "Public," in another "Swedish Citizen," in a third "FR," and in a fourth "Nobility (barons)"? Or of a field called "Places and/or geographical areas" which in sample records has the values: "Operated in Washington DC," "1 rue des Fosses-Saint-Bernard, 75005 Paris," "Unsettled areas of Western and Northern Canada," "diocese de Grenoble, Meurthe-et-Moselle, France," and "Early places of residence: Stockholm, Sweden (1833-1842, 1863-1864) St. Petersburg, Russia (1842-ca 1850). Places of laboratories and residence (Nobel kept 'homes' in several places): Krummel, close to Hamburg, Germany; Paris, France, Ardeer, Scotland; San Remo, Italy; Bjrkhaga, Karlskoga, Sweden."

Presumably the Ad Hoc Commission intends to edit this document completely. When it does so, it is likely to tighten up the bad examples and possibly even enable non-paper implementations, but it would probably be better for the archival profession if they stepped back even further a decided what, fundamentally, authority control was designed to achieve, and why it requires

archivists to invest what will certainly be thousands of person years in their creation?

Encoded Archival Description

The project which began as the "Berkeley Finding Aids Project" funded by the Department of Education has made substantial progress over the past year both in articulating a framework for SGML encoding of archival finding aids and in acquiring broad professional support for its efforts. In August it published the "Ann Arbor Accords: Principles and Criteria for a SGML Document Type Definition (DTD) for Finding Aids" and a proposed Document Type Definition standard (the EAD, or Encoded Archival Description DTD).

While the discussion of these is on-going, I hope that the strategy adopted by project director Daniel Pitti and his team will receive more critical review. While I fully support the use of SGML in interchange of cultural heritage information (having urged it in the Standards Framework for Interchange of Museum Information before this project was conceived), and am pleased that we have finally realized that finding aids contain most of the

value added content of archival description and their interchange therefore has the greatest potential value (an application of data interchange that I advocated to NISTF before they chose to pursue the application of cataloging surrogates for union databases), I believe both the principles adopted to formulate the DTD and the DTD itself are misguided. The framework tries to serve both the physical description requirements of those publishing finding aids and driving their current presentation with SGML encoding and the logical description requirements of those capturing the meanings in finding aids for search and retrieval. In the end it serves neither purpose well, being too generic to drive publication and too physical to serve as a framework for integrating knowledge across many collections. I continue to find it

odd that the group doesn't include representatives from Chadwyck-Healey Inc. which has substantial experience in SGML and publishes the National Inventory of Documentary Sources, a database of over 50,000 finding aids from US archival repositories. In addition, I find it distressing that the group has not adopted a model of the information services which it thinks its DTD is intended to support so that a discussion of the relevant criteria and their application could be based on arguments from functionality.

For more information on the EAD contact dpitti@library.berkeley.edu. To participate in the discussion, subscribe to the FIDAID listserv located at FINDAID@library.berkeley.edu by sending a message `sub FINDAID our name.`]

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