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## Archives and Museum Informatics

### *Cultural Heritage Informatics Quarterly*

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## EDITORIAL

### **International Culture Heritage Networking**

I have received with interest the most recent issue of *RAMA News* (#3) (from the French-based Remote Access to Museum Archives project) the new mission statement and program strategies announced by the Canadian Heritage Information Network and recent announcements by Vassar College and the National Initiative for Networked Cultural Heritage (NINCH) regarding the plan for an American Arts and Letters Network (AALN). All provide significant evidence that the concept of offering value-added services to the cultural heritage sector and access to cultural heritage resources over the Internet is an idea very much in the wind. Where are these efforts headed and how can we benefit?

Since first floating a centrally managed concept of an International Museum Information Network (IMIN) last year, Dominique Delouis of Telesystemes, who is the primary architect of the concept, has recast the IMIN and the role of the RAMA Consortium (read Telesystemes). In the latest RAMA newsletter, he envisions a structure to which the RAMA consortium and other organizations contribute that would build a "global decentralized electronic library of cultural and scientific resources." The areas of cooperation would be in establishing methods of digitization, standards, and intellectual property agreements. Participants would include information providers (libraries, archives and museums), publishers, and service operators. Telesystemes imagines its role would be as a provider of the Value Added Network Services: a local point of access, invoicing, and an open architecture to allow different providers to offer data. It is not yet clear how much this logical VAN will use the existing Internet infrastructure or what tools RAMA/Telesystemes actually can provide to link the logical contents of museum collections.

The Canadian Heritage Information Network begins from a twenty-year history of building a central database which for the past decade has been offered over a proprietary network. It is more oriented towards future programs grounded in applications and data linking services than in the network itself. Brokering the content of museum and heritage

collections to potential end-users and resellers will give them a stronger relationship with clients than that of the VAN relationship proposed by Telesystemes, and one less susceptible to challenge by technology developments in the broader Global Information Infrastructure. Whether CHIN can create the foundation for a global museum information service remains to be seen.

One of the uncertainties that the new environment presents is how much of what might be offered as a value-added service by one provider will in fact be available for free from other providers and how much better different competing services can be over time. The concept of an American Arts and Letters Network, which is essentially that of a directory to cultural heritage resources and a series of bibliographies, personnel directories, and software libraries, is the core information that would make the International Museum Information Network attractive, but it is proposed to be provided as a free Internet resource by a non-profit consortium whose interest is in expanding access to and knowledge of cultural information sources.

The issues these three proposals raise are critical for the community as a whole. Strategically, we need to determine if a separate network is viable or whether it will, in the longer run, lock us out of more services than it will provide. We need to determine if a content broker is useful, and if so how that broker might enhance the information in our separate repositories and reach audiences and resellers that would not be open to individual institutions. Finally we must decide what kinds of free directory services should be offered and be aware that many kinds of services started up under either of the first two scenarios could be susceptible to not-for-profit poaching as well as to for-profit competition. It is already evident that any plans made in this environment should judge their success by outcomes -- such as the availability of a full range of services to museums at an affordable cost -- rather than by income or their own continued existence. If the outcomes we want can be specified, and achieved, we should not worry too much about whether any particular vehicle for an IMIN succeeds. The next step for all those dedicated to the end we seek is to meet around how best to fabricate the International Museum Information Network of 1996 so that it can help launch, or stimulate through competition, the IMIN of 2000.

David Bearman, Editor

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## ARTICLE

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### Leaving Archival Electronic Records in Institutions: Policy and Monitoring Arrangements at the National Archives of Canada

by Terry Cook

In November 1993, the National Archivist of Canada approved a new policy for leaving certain categories of archival electronic records with their creating agencies.<sup>1</sup> This illustrates the rapidity in electronic archiving where ideas tested out as radical proposals from a conference podium are now translated into working reality in a couple of years rather than a couple of decades. At the NAGARA conference in the summer of 1990, David Bearman argued, in the first-ever concrete articulation of the idea, that archives "as repositories in the electronic age" were an "indefensible bastion," a throwback to the paper-record mindsets of the physical, curatorial, and custodial archives that archivists must leave behind them. Archives should be virtual rather than actual: they should aim to become central hubs to dispersed records rather than remain as at present mere information holders.<sup>2</sup>

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1 The policy was researched and written by Terry Cook, who wishes to acknowledge the useful comments and inputs of his National Archives' colleagues at that time: Eldon Frost, Jerry O'Brien, Nancy McMahon, and Doug Taylor-Munro. This policy was approved by the National Archivist of Canada in November 1993, and has been invoked by archivists in several appraisal and records disposition agreements negotiated with departments since then.

2 See David Bearman, "An Indefensible Bastion: Archives as Repositories in the Electronic Age," in David Bearman, ed., *Archival Management of Electronic Records*, Archives and Museum Informatics Technical report No. 13 (Pittsburgh, 1991), pp. 14-24. The counter argument is stated in Kenneth Thiboideau, "To be or not to be: Archives for Electronic Records," in *Ibid.*, pp. 1-13.

Other commentators, like Margaret Hedstrom,<sup>3</sup> accepted the wisdom of Bearman's direction, but questioned its unqualified application. She suggested that archivists must weigh numerous factors in order to decide whether to leave electronic archives with their creators or to acquire them in archives. This is not yet a black-or-white scenario; there are interesting areas of grey still to explore. She asserts correctly that "the track record of archivists is pretty dismal when it comes to preserving electronic records" within their own archival repositories. Conversely, there is yet "no evidence that the creating agencies can or will retain archival records for posterity," especially when their long-term use to the agency itself ends.

The National Archives of Canada (NA) agreed with Hedstrom's approach to meeting Bearman's challenge. There is widespread agreement that the various records management and archival concepts developed in and for a world of paper records need substantial modification in our electronic records universe.<sup>4</sup> But there is also the perception that now is not the right time to make a final determination of the issue; departments and agencies are not yet ready to assume custodial responsibility for all electronic records having archival value, nor have all of Hedstrom's enabling factors been sufficiently articulated and tested.

Accordingly, a policy was developed at the NA outlining the factors or circumstances in which archival electronic records could be left with their creating institutions as well as related terms and conditions governing such records. Equally, by implication, archival electronic records which do not meet these conditions will still be acquired by the NA itself. This policy therefore becomes in operation a concrete test of Bearman and Hedstrom's assumptions, and a learning mechanism for both NA archivists and their client departments. When the comfort level of departments increases with this approach, it may well be extended. There is almost no doubt that the various circumstances and conditions outlined

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3 See Margaret Hedstrom, "Archives as Repositories: A Commentary," in *Ibid.*, pp. 25-30.

4 For a sample statement, see, for example, Terry Cook, "Electronic Records, Paper Minds: The Revolution in Information Management and Archives in the Post-Custodial and Post-Modern World," *Archives and Manuscripts* 22 (November 1994), pp. 300-28.

in the NA's policy will change with advances in information and communications technology, modified information law and policies, greater awareness by departments of their own need to protect electronic evidence and ensure accountability frameworks,<sup>5</sup> and political and financial realities facing departments and archives. Nevertheless, despite these anticipated changes, it seems useful to publicize this policy now for others toiling in the electronic vineyards, with the hope that their experiences and subsequent comments will help produce a better vintage. The policy is reproduced below as approved save for some editing out of internal NA procedural detail and adding some explanatory phrases.

\* \* \* \* \*

This policy paper addresses why the National Archives of Canada may wish to leave archival electronic records of the Government of Canada in government institutions rather than transfer them to the control of the National Archives of Canada (NA). Such case-by-case decisions are authorized by the National Archivist and will respect the spirit of the National Archives of Canada Act by ensuring that archival records left in institutions are preserved, conserved, described, and made accessible. (The related issue of leaving other media of records in government institutions -- photographs, maps, paintings, etc. -- will be addressed in a separate document.)

This policy paper outlines several circumstances and offers examples where leaving government archival electronic records in institutions may be appropriate, and suggests the model monitoring clauses that the archivist should have signed by the institution in order to facilitate the proper preservation of archival electronic records left in government institutions. The clauses focus on electronic records stored on magnetic

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5 On the concepts of evidence, recordness, and accountability, and the functional requirements needed to achieve these in modern information systems, see many of the essays in David Bearman, Electronic Evidence: Strategies for Managing Records in Contemporary Organizations (Pittsburgh, 1994). For a popular introduction to these issues, and their importance alike to archivists and records-creating organizations, see Terry Cook, "It's 10 O'Clock: Do You Know Where Your Data Are?," Technology Review, Massachusetts Institute of Technology (January 1995): 48-53.

tape, which is the immediate problem and the principal, although not sole, emphasis of this paper. It is recognized that similar monitoring clauses will have to be developed for other electronic media that fully respect their physical characteristics and conservation concerns.

In writing individual Archival Appraisal Reports, archivists will use these policy guidelines for two purposes: to negotiate and craft appropriate Terms and Conditions for the formal Agreement which institutions are to sign indicating their intention to comply, in return for receiving the Archivist's authority to destroy other related records without archival value; and to make recommendations to the National Archivist who will make the final decision on the disposition and custodial retention of the records.

### **A. Why Leave Archival Records In Government Institutions**

There are occasions, especially for electronic records, where it is not feasible or the best use of NA resources to acquire the records identified as archival at the time the Archival Appraisal Report is approved. The National Archivist may in such cases accept the recommendation to leave electronic records identified as archival in the creating institution. Such occasions or reasons might include:

- (1) Where the cost of transfer of the record or other technical considerations (software copyright, data complexity, software and hardware dependency, etc.) make it impossible for the National Archives to acquire the record at this time; and/or
- (2) Where the institution has a continuing and long-term operational need for the record, which includes the provision of elaborate and extensive reference services; and/or
- (3) Where because of the nature of the record reference services can best be provided by the institution rather than by the National Archives; and/or
- (4) Where there are statutory provisions that prevent transfer to the National Archives of Canada.

In all such cases, the archivist, in making a recommendation to the National Archivist for any of these reasons, must ensure that the elec-

tronic record is not at threat or known to be (as part of regular data-processing routines) subject to erasure, updating, or deletion. The Agreement (with its attached Terms and Conditions) will specify, on a case-by-case basis, that the institution must ensure preservation of the records in a useable format, permit their description in archival inventories, and grant access to the records for researchers within the framework of the Access to Information and Privacy legislation, and that the National Archives will monitor compliance with these Terms and Conditions according to a specified timetable. The Authority of the National Archivist to destroy other records is granted explicitly on condition that the Agreement is so respected.

Archival records left in institutions are not considered to be under the control of the National Archives of Canada in terms of the application of the Access to Information and Privacy Acts.

It must also be noted that some institutions refuse to transfer electronic (or other) records to the control of the National Archives of Canada, usually because of access or security or legal considerations. This often involves the institution insisting on a retention period much longer than the National Archives can support. In these cases, the records are also de facto "left out" in government institutions and not transferred to the National Archives, even though this is not a desired situation by the National Archives. Nevertheless, in such situations, the National Archives must recognize reality and seek to protect such records until their eventual transfer.

### **B. Categories and Examples of Records To Be Left In Institutions**

Unlike paper-based records for which only one copy usually exists, it is normal practice for the National Archives to acquire an archival copy or version of electronic records as soon as archival value has been established, and in advance of the expiry of the period of operational use of the record in the creating institution. This practice is to ensure the archival preservation of the information in fragile electronic media. However, it is not always practical or realistic to follow this practice.

The following are categories of electronic records where leaving them in government institutions may be necessary or prudent, with

examples given of each case. These categories are not mutually exclusive, and are not to be interpreted by archivists in making their recommendations as blanket or ironclad rules. Rather, these are guidelines designed to help the archivist in the appraisal process, who should at least consider the possibility of not acquiring the records if **any** of these circumstances pertain. Archivists should, however, justify their recommendation **either way** (i.e., to acquire or to “leave out”) for these categories of electronic records covered by their Archival Appraisal Reports, so that the National Archivist has clear grounds for making a final decision. As noted above, the last category below is one which the NA does **not** support, but which it must sometimes de facto recognize.

(1) **Cumulative, longitudinal systems and records**, where by definition no data deletion, erasure, or replacement occurs. Scientific and environmental systems often display this character, for example, wildlife tracking systems, environmental incidents systems, toxic or hazardous spills systems, mineral resources inventories, etc. Some social data, such as housing loans or longitudinal labour force employment profiles, may also be cumulative, although less often. Researchers would always approach the creating institution for access to such live and current and cumulative system information, rather than trying to recreate the functionality of such systems by mounting flat files and merging into new software the numerous off-loaded annual or other “slices” possibly retained at the NA.

(2) **Bibliographic or cataloguing systems or records**, where the first point of access would never be the National Archives, because, again, the NA would only hold a truncated and incomplete version of the record. Examples include the Crystalline Formulations database at the National Research Council profiling every known crystalline structure to which new ones are added as they are discovered but no old ones are deleted, the Canadian Heritage Information Network system that inventories the holdings of many of the nation’s museums, or the catalogue system for the mandatory deposit holdings of the National Library of Canada.

(3) **Data where the creating institution has as its own operational requirement the provision of extensive and elaborate reference service, and has the resources and the willingness to provide such**

**services to Canadians which for now the National Archives cannot match.** The issue here, unlike B(1) and B(2) above, is not the nature of the data or record per se, but rather the level of reference service that can best be provided to Canadians. The Immigration Statistics Division of the Department of Citizenship and Immigration employs several people answering (and creating research data subsets for) some 200 inquiries a month, whereas the National Archives has one-half of one archivist responsible for all three archival functions (appraisal and description as well as reference) for immigration electronic and textual records. This would be true as well for many of Statistics Canada’s holdings and reference activities. In these cases, it is essential that lengthy retention periods be established, in order that NA resources not be overwhelmed with such high levels of reference work, even while acknowledging that access for researchers for some such electronic records left in institutions may not always be easy or economical. The point is that such access to the same records if they were at the National Archives would either be impossible or even less easy or economical.

(4) **Records where it is not technically feasible or cost effective to acquire a version of the record for National Archives holdings.** Certain complex computer systems and software will also fall into this category, although decreasingly so with data interchange standards and software independent platforms emerging “out there” that increasingly allow the National Archives’ own processing system to recreate the original system’s functionality in an archival setting. Mega data systems for atmospheric and weather conditions, however, sometimes cost literally in the billions of dollars and will continue to remain prohibitive for archival transfer consideration. (This B(4) item is different from B(1), although a corollary to it: here in B(4) it is technically or financially impossible to acquire the record; in B(1), the record could be acquired, but because of its cumulative nature, should not be. Of course, there is overlap between the two for some data: weather data systems may be both cumulative in nature **and** too costly. Others, however, like wildlife monitoring systems, are cumulative (B(1)), but neither costly nor technically complex (B(4).)

(5) **Data where institutions for whatever reasons (security, sensitivity) refuse to transfer the record to the National Archives, at least until the expiry of a lengthy retention period.** The National

Archives does not encourage or support this situation, unless one or more of the above four circumstances is also present. Because the data is threatened in such situations, a more stringent monitoring clause is suggested in the next section of this paper.

### C. National Archives Monitoring Of Electronic Records Left In Government Institutions

Where it is decided that electronic records are to be left in the institution, which decision must be justified in the Archival Appraisal Report, the archivist inserts one of the following two clauses (or close adaptation of them) into the formal Terms and Conditions attached to the Agreement. The institution's senior official accountable for information management and records disposition must formally sign the agreement indicating the institution's concurrence. The archivist also ensures that the NA's database for tracking such Agreements is updated to reflect these new records and that they will be "brought forward" at regular, specified intervals to be monitored by the NA to ensure that the records continue not to be threatened and that the following appropriate preservation standards are enforced:

*(1) Standard technical clause for Terms and Conditions where the immediate transfer of a cumulative or longitudinal datafile or other record is not desirable (meeting one or more of Categories B(1) to B(4) above):*

Preserve the xxx Data System for possible future transfer. The National Archives of Canada shall be notified if there are major changes to the system, including (but not limited to) new hardware environment, new software, significant addition or subtraction in the number of data elements incorporated in the system, significant new internal uses for the system (including migration to other systems), as well as the possible abandonment of the system. If such changes occur, the National Archives of Canada may exercise its option to acquire a copy of the data at that time. The National Archives of Canada will monitor the operation of the system every two years, beginning on (day/month/year).

*(2) Standard technical clause for Terms and Conditions where the immediate transfer of a non-cumulative datafile or other records is refused by the institution (Category B(5) above):*

The magnetic tapes containing this [xxx data, datafile, tc.] will be stored in a controlled, dust-free environment with a **maximum** relative humidity of 50%. The magnetic tape must be rewound yearly with a tension of 4 oz./square inch and recopied every five years onto new tape. Provision must be made to keep the data on the magnetic tapes technologically current; if the computer system that created the tapes is changed, the stored magnetic tape must be updated so that it is usable on the new system. Two backup copies should be preserved, one of which must be stored offsite in a Federal Records Centre tape vault or similar facility. The National Archives of Canada will monitor these conditions every two years, beginning on (day/month/year).

□

## Archival Repositories on the World Wide Web: A Preliminary Survey and Analysis

David A. Wallace (davidw@lis.pitt.edu)

### Introduction

This column will review the activities and products of archivists and archives on the World Wide Web (WWW) by reviewing 15 institutional home pages representing three institutional types: five government archives, five college and university archives, and five subject-oriented collections. These sites will be evaluated along six broad dimensions: Finding Aids; Collections; Reference Services; Search and Retrieval Interface; Institutional Information and Policies; and User Information. These six dimensions are themselves divided into 21 narrower sub-dimensions (See Figure One).

Each of these 15 sites are available through the two archives multi-site guides discussed in my last column [Volume 9, Number 1]:

- Archives and Archivists List  
(<http://www.muohio.edu/~archiveslist/>)
- Libraries and Archives  
(<http://cavern.uark.edu/comminfo/www/libraries.html>)

Site inclusion in this article was predicated upon their being a “true” WWW site and not just a Gopher site available through the WWW. (Though, it should be noted that several of the sites examined below do possess Gopher functionalities, especially when it comes to providing users with a search and retrieval interface.)

The two archives multi-site guides which served as the sources for the 15 sites chosen for this study cite about 55 individual WWW archives sites. It is felt that a sample of 15 out of a possible 55 is a suitable

proportion for rendering a sub-population which broadly represents the entire population.

In analyzing the sample population I found few government archives WWW sites. As a consequence, I was barely able to isolate the number necessary for inclusion into this study. The other two archives types examined here presented a somewhat wider menu to choose from. In order to be included in the college and university archives sample of five, a site had to focus upon the archives of that institution rather than focusing primarily on “special collections” housed within it. To be one of the five subject-oriented sites chosen, a site was required to focus upon a particular topic. After organizing them into categories, I selected the 15 sites by randomly scrolling down the lists in the multi-site guides and clicking on institutions which fit into one of the three categories.

The 15 sites evaluated are:

- **Government Archives:**
  - United States National Archives and Records Administration  
(<http://www.nara.gov/>)
  - Oregon State Archives  
(<http://arcweb.sos.state.or.us/>)
  - Maryland State Archives  
(<http://www.mdarchives.state.md.us/>)
  - United Kingdom Public Records Office  
(<http://www.open.gov.uk/pro/prohome.htm>)
  - British Columbia Archives and Records Service  
(<http://www.bcars.gs.gov.bc.ca/bcars.html>)
- **College and University Archives:**
  - University of Notre Dame Archives  
(<http://archives1.archives.nd.edu/guidecon.html>)
  - Washington University Archives  
(<http://library.wustl.edu/~spec/archives/>)
  - Rice University Archives  
(<http://riceinfo.rice.edu/Fondren/archives.html>)
  - Wheaton College Archives and Special Collections  
(<http://www.wheaton.edu/~wcarhiv/SpecServ/special.html>)

- University of Sydney Archives  
(<http://www.usyd.edu.au/su/archives/>)
- **Subject-Oriented Collections:**
  - Charles Babbage Institute  
(<http://fs1.itdean.umn.edu/cbi/cbihome.html>)
  - Harry Ransom Humanities Research Center  
(<http://www.Lib.utexas.edu/Libs/HRC/HRC.HP.html>)
  - Southern Folklife Collection  
(<http://ils.unc.edu/barba/sfc.html>)
  - History of Medicine Archives, National Library of Medicine  
(<http://www.nlm.nih.gov/hmd.dir/hmd.html>)
  - Oriental Institute Research Archives (University of Chicago)  
([http://sippar-orinst.uchicago.edu/OI/DEPT/RA/Research\\_Arch.html](http://sippar-orinst.uchicago.edu/OI/DEPT/RA/Research_Arch.html))

This article focuses strictly on information content and not on ergonomic aspects such as how particular sites are organized, the degree of their user friendliness or unfriendliness, and the logic of their hypertext links and flows. The dimensions and sub-dimensions examined deal primarily with documentation about an institution's collections and as well as the institution's services and policies. In this sense, what follows is a home page content analysis, as opposed to a stylistic analysis. I felt that even a cursory "environmental scan" of a representative sample of 15 archival WWW sites along these lines would be illuminating for a number of reasons. First, it would gauge representations of how basic archival functions and policies are being incorporated or ignored in the distributed network environment. Second, it would uncover the degree of variation and similarity between institutions. And, third, it will show the degree of interactivity archives WWW home pages present to users. Are users able to query the collection? Are they able to submit reference questions online? Can they search only the finding aids or are they also able to conduct searches of the actual collections themselves? Also, are actual collection items available for viewing? If so, what media types have been digitized for remote access?

This study will give us a sense of how archives home pages are being viewed by the authoring institution. Are archives home pages being developed which merely replicate our paper-based functionalities, or are

the advantages inherent in hypertext, digitization of materials, and sophisticated search and retrieval interfaces being employed? Are they best viewed as institutional advertisements? As sources for preparing research visits? Or, do they actually provide a useful space for conducting concrete research?

Figure One lays out the dimensions and sub-dimensions to be evaluated, the possible values each can possess, and the meaning of each of the sub-dimensions measured. Figures Two, Three, and Four present the results of the survey.

**Figure One: Evaluative Criteria**

Dimension	Sub-dimension	Values	Meaning
Finding Aids	Available	Y/N	Are findings aids available on this WWW site?
	Format	Text/Hypertext	Are collection/fonds level findings aids presented as ASCII text files or are hypertext links built into them?
	Searchable	Y/N/na/?	Are the findings aids searchable?
Collections	Available	Y/N	Are actual items from this institution's collections available for viewing?
	Format	Text/Still Images/Moving Images/ Sound	In what format(s) are items from collections available?
	Searchable	Y/N/na/?	Are the collections searchable?
	Links to External Collections	Y/N	Are hypertext links provided to collections from other institutions?
Reference Services	Available	Y/N	Are reference services provided through this WWW site?

Dimension	Sub-dimension	Values	Meaning
	Online Queries	Y/N/na/?	Does this WWW site accept online queries from users?
	Document Delivery	Y/N/na/?	Des this institution negotiate document delivery services through its WWW site?
<b>Search &amp; Retrieval Interface</b>	Available	Y/N	Does this WWW site provide users with a search and retrieval interface to its collectons?
	Browsable Index(es)	Y/N/na/?	Does this WWW site provide users the ability to scroll through indexes to collections and/or finding aids?
	Authority Control	Y/N/na/?	Does this WWW site employ authority control to its descriptions?
<b>Institutional Information &amp; Policies</b>	Annual Report	Y/N	Does this WWW site provide access to this institution's annual report(s)?
	Mission Statement	Y/N	Does this WWW site provide this institution's mission statement?
	Acquisition	Y/N	Does this WWW site provide this institution's acquisition policies?
	Access	Y/N	Does this WWW site provide this institution's access policies?
	Copying	Y/N	Does this WWW site provide this institution's copying policies?
<b>User Information</b>	Statistics	Y/N	Does this WWW site provide statistics on use of this WWW site?

Dimension	Sub-dimension	Values	Meaning
	User Feedback	Y/N	Does this WWW site provide users the opportunity to submit online feedback to this institution?
	On Archives	Y/N	Does this WWW site provide basic information on what archives are for novices?

**Figure Two: Government Archives**

US-U.S. National Archives and Records Administration; OR-Oregon State Archives; MD-Maryland State Archives; UK-United Kingdom Public Records Office; BC-British Columbia Archives and Records Service

Dimension	Sub-dimension	US	OR	MD	UK	BC
<b>Finding Aids</b>	Available	Y	Y	Y	Y	Y
	Format	Text	Hypertext	Text	Text	Hypertext
	Searchable	Y	N	N	N	Y
<b>Collections</b>	Available	N	Y	Y	N	Y
	Format(s)	na	Text/Still Image	Still Image	na	Still Image/ Moving Image
	Searchable	na	N	N	na	Y
	Links to External Collections	Y	N	N	N	N
<b>Reference Services</b>	Available	Y	Y	N	N	Y
	Online Queries	Y	Y	na	na	Y

Dimension	Sub-dimension	US	OR	MD	UK	BC
	Document Delivery	N	Y	na	na	N
<b>Search &amp; Retrieval Interface</b>	Available	Y	Y	N	N	Y
	Browsable Index(es)	N	N	na	na	Y
	Authority Control	?	?	na	na	Y
<b>Institutional Information &amp; Policies</b>	Annual Report	N	N	N	N	Y
	Mission Statement	Y	N	N	N	N
	Acquisition	Y	N	Y	N	N
	Access	Y	Y	Y	Y	Y
	Copying	Y	Y	Y	N	Y
<b>User Information</b>	Statistics	N	N	N	N	Y
	User Feedback	Y	Y	Y	N	Y
	On Archives	N	N	N	N	N

**Figure Three: College and University Archives**

UND-University of Notre Dame; WU-Washington University; RU-Rice University; WC-Wheaton College; US-University of Sydney

Dimension	Sub-dimension	UND	WU	RU	WC	US
<b>Finding Aids</b>	Available	Y	Y	Y	Y	Y
	Format	Hyper-text	Text	Text	Hyper-text	Text
	Searchable	Y	N	N	Y	N
<b>Collections</b>	Available	Y	Y	Y	N	Y
	Format(s)	Still Image	Still Image	Still Image	na	Text/Still Image
	Searchable	Y	N	N	na	N
	Links to External Collections	N	Y	N	Y	N
<b>Reference Services</b>	Available	N	N	Y	Y	N
	Online Queries	na	na	Y	Y	na
	Document Delivery	na	na	N	?	na
<b>Search &amp; Retrieval Interface</b>	Available	Y	N	N	Y	N
	Browsable Index(es)	Y	na	na	N	na
	Authority Control	Y	na	na	?	na
<b>Institutional Information &amp; Policies</b>	Annual Report	N	N	N	N	N

Dimension	Sub-dimension	UND	WU	RU	WC	US
	Mission Statement	N	N	N	N	N
	Acquisition	N	N	N	N	N
	Access	N	Y	Y	N	Y
	Copying	N	Y	Y	Y	N
<b>User Information</b>	Statistics	N	N	N	N	N
	User Feedback	Y	Y	Y	Y	Y
	On Archives	N	N	N	N	Y

**Figure Four: Subject-Oriented Archives**

OI-Oriental Institute; CBI-Charles Babbage Institute; HRC-Harry Ransom Humanities Research Center; SFC-Southern Folklife Collection; HMA-History of Medicine Archives.

Dimension	Sub-dimension	OI	CBI	HRC	SFL	HMA
<b>Finding Aids</b>	Available	Y	Y	Y	Y	N
	Format	Text	Text	Text	Hypertext	na
	Searchable	N	Y	N	N	na
<b>Collections</b>	Available	N	Y	N	Y	Y
	Format(s)	na	Text/ Still Image	na	Still Image/ Sound	Text/ Still Image
	Searchable	na	N	na	N	Y

Dimension	Sub-dimension	OI	CBI	HRC	SFL	HMA
	Links to External Collections	Y	Y	N	Y	N
<b>Reference Services</b>	Available	N	Y	Y	N	N
	Online Queries	na	na	Y	na	na
	Document Delivery	na	Y	N	na	na
<b>Search &amp; Retrieval Interface</b>	Available	N	Y	N	N	Y
	Browsable Index(es)	na	N	na	na	N
	Authority Control	na	?	na	na	?
<b>Institutional Information &amp; Policies</b>	Annual Report	Y	N	N	N	N
	Mission Statement	N	N	N	N	N
	Acquisition	N	N	N	N	N
	Access	Y	Y	Y	N	Y
	Copying	Y	Y	Y	N	N
<b>User Information</b>	Statistics	N	N	N	N	Y
	User Feedback	N	Y	Y	N	Y
	On Archives	N	N	N	N	N

## Discussion

Even a cursory examination of the above three figures shows that there is a wide degree of diversity among institutions and even among institutions within the same archives type. The following discussion summarizes the patterns which emerge from the above figures and also notes worthy exceptions. [Footnote: Since the British Columbia Archives and Records Service was considered in detail in the last issue, it will largely be ignored in the discussion that follows.]

- **Finding Aids**

Finding aids were found to be almost universally available at the sites examined. Ironically, the one exception to this, the History of Medicine Archives, provided online access to nearly 60,000 images from its collections, by far the most generous offering of primary holdings encountered. It also provided a quite sophisticated search-and-retrieval interface for accessing these.

Despite the richness of access and ease of use afforded by hypertext functionality, only one-third of the sites reviewed provided hypertext links within collection/fonds level finding aids. More commonly, finding aids are presented as simple static ASCII text files. The opportunity implicit in hypertext is that a user would be able to scroll through a hypertext finding aid and be provided with any number of departure points, such as jumping to specific parts of individual finding aids, clicking directly from a collection description to specific items within that collection, or jumping to related collections available at other institutions.

The Oregon State Archives' "Oregon Historical Records County Guide" provides individual county descriptions each of which has hypertext links to both an overview tracing the historical and administrative development of that county, as well as specific series descriptions and inventories of records from that county. Notre Dame University allows users to scroll through an alphabetically arranged index (seemingly developed with authority control). Hypertext links to inventory descriptions are provided through the index, meaning that once a user finds a desired term in the index they can click on the hypertext link

associated with that index term and be presented with inventory descriptions containing the term. Inventory descriptions themselves contain hypertext links to more detailed descriptions. Users can also scroll through an alphabetically arranged index to the collection descriptions. Once a collection is chosen, the user has the option to jump to the inventory for that collection. Wheaton College provides access to individual collections through hypertext links to separate portions of individual findings aids, such as an Introduction, Agency History, Series Description, Scope and Content Notes, and Collection Inventory. Users are further permitted the option of searching for collections through the Wheaton College Library Catalog.

Interestingly, providing hypertext links within findings aids does not ensure that an institution will also provide a searching capability to its finding aids. The contents of plain ASCII finding aids were searchable at the U.S. National Archives and the Charles Babbage Institute, while hypertext findings aids at the Oregon State Archives and the Southern Folklife Collection were not.

Sites also varied considerably on the number of collection descriptions that were provided. The University of Sydney and the Harry Ransom Humanities Research Center provide no more than a dozen descriptions, while sites like the U.S. National Archives provide hundreds of individual descriptions.

Also worth noting is the fact that two institutions, the Maryland State Archives and the U.K. Public Records Office (PRO) provided information from finding aids which were geared to high use records. The Maryland site provides a listing of indexes for records such as Probate, Marriage, Birth and Death, Naturalization, etc. And the U.K. PRO provides a pointer to genealogically desirable records associated with "Tracing an Ancestor" in the Army, Navy, Merchant Navy, and/or Metropolitan Police, or who was either an immigrant or emigrant. These broad categories provide listings of records classes and where they can be found in the PRO's reference area. Given the high use of archives for genealogical purposes, the PRO seems to have striven first to provide online that information most likely to be desired by remote users.

Finally, sites also differed on the level of description offered for collections. Some went to the item level, while most did not stray below the collection/fonds level, and a few provided no more than a collection's title.

- **Collections**

While two-thirds of the sites exhibited at least some portion of their collections online, this seeming prominence is illusory. Several of these institutions, including the Maryland State Archives, University of Notre Dame Archives, Washington University Archives, the University of Sydney Archives, the Charles Babbage Institute, and the Southern Folklife Collection, provide rather limited collection item representations, and these were mostly digitized photographs. Unique format representations are provided by the Southern Folklife Collection, which delivers some sound recordings from its holdings, and the British Columbia Archives and Records Service, which provides some moving images. However, these unique format types are offered in quite sparse helpings as well.

Interestingly, none of these sites provided access to large number of digitized textual documents. To my mind this speaks to the assumption that large scale digitization of collections for the purpose of providing them to remote users over the Internet remains to be suitably justified in terms of the labor and financial expenses such digitization projects entail, especially given the likely internecine struggles for limited resources facing most archives. Nevertheless, current bold initiatives, such as the Library of Congress's Digital Library Program, will hopefully lay a replicable roadmap for other institutions to follow.

Despite the slim offerings most sites provide, two sites concretely demonstrate the promise inherent in "virtual archives." As already noted above, the History of Medicine Archives provides online access to "nearly 60,000 images (reproducing photographs, artwork, and printed texts)." In addition, the British Columbia Archives and Records Service provides online access to some 5,000 photographs from its holdings. Not surprisingly, these two sites, as well as the University of Notre Dame Archives, were the only ones which allowed remote users to directly search the collections themselves.

Surprisingly, given the seeming ease of creating useful and creative linkages to other archives, less than half of the sites evaluated provided this option in their WWW home pages. The Oriental Institute Research Archives provided the most comprehensive pointer to other sites, enabling users to scroll through index listings for authors, library catalogs, journals, museum collections, project or institutional affiliations, publishers, and book dealers, as well as regional and subject indexes. The Washington University Archives offers a "Directory to Archives and Manuscript Repositories in the St. Louis Area," published by the Association of St. Louis Area Archivists. It is the availability of this kind of reference guide which should be more commonly available at more sites.

- **Reference Services**

The ability to offer remote reference services should present yet another rich opportunity made possible by distributed network environments. However, fewer than half of the WWW sites surveyed here accommodate such a function, and most do so only half-heartedly by providing an e-mail address for users who wish to submit questions. It would appear that the fear of being swamped by queries, and being swamped by overly broad queries, is perhaps one of the factors archives consider when deciding whether to offer such services. The Oregon State Archives is one institution which seems to have fully embraced this possibility, though I did have trouble accessing this link. Here, users are able to submit online reference queries and can request document delivery and copying services online. Patrons are informed that photocopies of requested materials will be sent by regular mail services, and that the requester will be notified via email regarding the charges and approximate date of mailing. In an odd twist, while the Charles Babbage Institute does not formally offer online reference querying services, it does provide for the option of ordering oral history transcripts online and can even opt to have the text of these delivered via e-mail.

- **Search & Retrieval Interface**

Seven out of the 15 sites evaluated offered users an online search and retrieval interface within their WWW sites. More often than not these interfaces are Gopher search and retrieval tools embedded within the WWW hypertext and hypermedia format.

One exception to this is the History of Medicine Archives, which is a part of the History of Medicine Division at the National Library of Medicine. A sophisticated search-and-retrieval interface is provided through the institution's "Online Images from the History of Medicine" hypertext link. Searching can be done for images using text expressions or frame number (an image reference number). Here, users are presented with a page long search form which allows the user to enter a "search pattern" along the following attributes: Text Field, Title/Abstract, Name Field(s), Start and End Year (both B.C. and A.D.), and Geographic Location. No browsable index is available, though, and there is no indication that authority control was employed despite the high likelihood that it probably was.

The U.S. National Archives uses the "Jughead" search engine to search public Gopher menus. However, it was unclear to me as to what is and is not being searched. I was able to retrieve holdings of the Center for Electronic Records, some microfilm collections, and holdings from some of the Presidential libraries through this search interface. I was not able, though, to isolate any specific content from the *Guide to Federal Records in the National Archives of the United States*, available at this site in a hypertext version. This interface is part of the Archives "CLIO" system which "combines vast collections of information available about [NARA] with easy access to diverse electronic resources over the Internet."

The Oregon State Archives currently provides access to an "experimental" interface which searches only the full text of minutes of the 1991 and 1993 Oregon Legislature.

The University of Notre Dame Archives allows searching to be done across inventories to all types of collections. It also enables users to restrict their queries to specific types of collections, such as Manuscripts, Photographs, Printed Material, Audio-Visual-Material, or University Records. Retrievals here present the user with a collection's name (in hypertext format), its box and folder number (if available), and its heading, and its date(s). Once a particular item is chosen, the system retrieves the inventory to which that item belongs. Interestingly, while the collections themselves are searchable, the user cannot currently call up a representation of what was retrieved.

A browsable index was available at only two of the 15 sites. At the University of Notre Dame Archives, hypertext links to inventory descriptions are provided through the index. This means that once a user finds a desired term in the index, he or she can click on the hypertext link associated with that index term and be presented with an inventory description containing that term. Users can also scroll through an alphabetically arranged index to the collection descriptions themselves. Once a collection is chosen, the user has the option to jump to the inventory for that collection.

Finally, while no institution publicized that it indexed and described its collections through authority control, it seems likely to me that more than just two of these sites do. This sub-dimension was the hardest to draw clear data on.

#### • Institutional Information & Policies

As I gathered data about policies, I was somewhat surprised that more wasn't available. Only two sites, the British Columbia Archives and Records Service and the Oriental Institute Research Archives, provided access to their annual reports. The British Columbia Archives and Records Service was alone among the five government archives sites visited in doing so. Its available annual report includes separate sections on Policies and Standards for Records Management, Archival Acquisition, Storage and Conservation, Imaging Services, Public Use of Archives, Library, Catalogues and Finding Aids, Training Others: Ministries and Community Archives, Community Assistance, Future Directions, and, Working Environment. This institution also provides a detailed Research Orientation Guide in hypertext form. The Oriental Institute Research Archives provides online access to their last three annual reports.

Mission statement-like commentaries are sort of embedded in the text of descriptions of several institutions, yet only the U.S. National Archives provides users with a formal separate mission statement. NARA also provides online access to appropriate governing sections of the Code of Federal Regulations. If, as suspected, that online archives will open up these institutions to a broader audience, it seems that a mission statement would be a mandatory item at the top of any home page.

Formal acquisition policies were all but non-existent. Instead, users are confronted with acquisition "statements" embedded in other descriptive texts which casually outline the types of materials an institution gathers. Sites fared much better when it came to providing copying and access policies, though these too were often lost in longer institutional-description narratives. Wheaton College was more explicit than most, providing separate policies for circulation, photocopying, copyright, electronic data, photograph loan and use, and photograph publication. Unfortunately, potentially relevant information was not obtainable at the Charles Babbage Institute's homepage during my visit -- the directory within the "About CBI" link was not accessible.

As an aside, the Maryland State Archives should be pointed out for some of its rather intriguing offerings. This WWW home page was developed as part of the Division of Library Development and Services participation in Maryland's SAILOR project. "SAILOR," they tell us, "is Maryland's online information system that provides Marylanders with access to Internet resources." Though relatively sparse on the dimensions and sub-dimensions evaluated in this study, the Maryland State Archives does include links to "Education and Outreach" and "Preservation and Conservation." The Education and Outreach page includes hypertext links to projects such as "Biographic Initiative" which conducts research on historical figures, the "Documents for the Classroom" program which "makes facsimiles of original documents available for use by teachers and students in elementary and secondary schools, as well as colleges and universities," the "Teacher's Institutes" which educates teachers on how to incorporate original sources into the classroom, and "Volunteer Programs" for residents who wish to assist archives staff in reference duties. The "Preservation and Conservation" link on the home page provides information on the archives "Task Force to Initiate Preservation Planning in Maryland." In addition, this site provides more information than most sites on the archives itself and its history, as well as information on the history of the state and its governing structures. It also includes useful descriptions on the types of vital records the state archives holds and the access policies governing their use.

There is a clear need for more information regarding the archives themselves (such as their enabling legislation, operational responsibili-

ties, and collecting missions) as well as the policies governing access and use. Such texts would go a long way in contextualizing the institutions and the profession to the Internet audience. Also, these sites provide a rich potential for professional communication and exchange. The availability of institutional policy documents, appraisal reports, preservation and conservation reports, and the like could ignite greater professionalization and intellectual dynamism within the profession. This is essential given the paucity of formal archival education programs.

#### • User Information

Nearly all of the 15 sites provided for user feedback. The Harry Ransom Humanities Research Center presents a nice data entry form for submitting online comments. Most all other sites solicited feedback solely by providing an email contact address.

Only two institutions provided actual usage statistics for their WWW sites. The British Columbia Archives and Records Service provides monthly access statistics along a number of dimensions -- broken down into daily, hourly, and country access. Interestingly, this site enjoys (?) almost no visits from foreigners. I was not able to determine what statistics are collected and offered at the History of Medicine Archives, as the link was not operating at the time of my visits. Some may legitimately question the need to have such information online. However, it seems to me that this data provides visitors with a sense of the popularity of the site and, further, give a realistic sense of just how often these types of sites are actually visited. Such information could provide other archives concrete reasons to develop or not develop their own WWW sites -- factoring in costs and benefits for dedicating money, technology and staff talents to such efforts.

Perhaps the most perplexing absence along all of the 21 sub-dimensions evaluated was the fact that only the University of Sydney provided a basic description of what archives are for the casual non-professional visitor. The university's tutorial on archives lies towards the bottom of a file containing the University Archives journal. The relevant information exists within the text of an address given by Kenneth E. Smith, University Archivist, to the Sydney University Arts Alumni, and goes

into some detail about what archives are and the roles and functions of the archivist.

Though it is likely that questioning any random lay person as to what an archives is, they could come up with something approximating reality ("Archives collect old papers."), these sites provide a ripe venue through which to explain not only what archives are but also what archivists actually do. Strong cases can be made to show that archives are important because they protect citizen rights, provide for governmental accountability, and enhance our culture and lives by tracing all kinds of social, technical, and artistic threads back through time.

- **Conclusion:**

What is one to make of such diversity? On one hand it clearly demonstrates that archives choosing to make a presence on the WWW are customizing their sites based upon their own institutional imperatives. They best know both their customers and their holdings, hence, the choices they make seem to reflect their perceived needs to match one with the other. On the other hand, the lack of any basic standards makes the hope for useful inter-institutional data exchange a fruitless endeavor in the present environment. This, of course leads to the inevitable question: What are the use of these sites? Are they for advertising? Research preparation? Research itself?

With few exceptions, most sites have not digitized a significant proportion of materials to truly facilitate any type of sustained research or educational edification. Despite this short coming, these institutions are clearly on the cutting edge. The institution of a global information infrastructure is accelerating rapidly. International agreements are being reached and new cooperative international arrangements are always surfacing. Yet, for archives, much work needs to be done, especially in the area of data interchange standards via WWW technologies. Since it is only through such standards that seamless virtual archives will cease to be institution-based and become user-driven. If the promise of hypertext and hypermedia is achieved, users will be able to leap from one site and collection to the next, tracing their unique research, education, and accountability needs across state and national borders without having to punch in a new URL or conduct stop-and-start searching.

In the end, it seems that archivists have to more systematically ask themselves "Who is the customer, what benefit accrues to institutions creating WWW sites, and what is the outcome desired from creating an institutional WWW site??"

## Internet News and New Sites of Interest

### Building a Catalog of Internet Resources

OCLC recently announced a call for participation by libraries in an OCLC-led project entitled "Building a Catalog of Internet Resources." The announcement notes that this project "initiates a nationwide, coordinated effort among libraries and institutions of higher education to create, implement, test, and evaluate a searchable database of USMARC format bibliographic records, complete with electronic location and access information...for Internet-accessible materials." As of mid-May over 125 libraries from the U.S. and across the globe have enrolled. Libraries of all "types and sizes" are encouraged to sign-up. OCLC membership is not required for interested institutions. For more information contact Erik Jul ([jul@oclc.org](mailto:jul@oclc.org)) or visit <http://www.oclc.org> (then go to "What's New...What's Hot" and choose "Internet Cataloging Project.") Information is also available via ftp at [ftp.rsch.oclc.org/pub/internet\\_catalog\\_project](ftp.rsch.oclc.org/pub/internet_catalog_project).

### New Sites and Happenings:

- \* 1002 Situations - An Interactive Peoples Museum on the Internet (<http://fgidec1.tuwien.ac.at/1002situations/>)

This virtual museum encourages visitors to submit their own content -- text, photos, sound -- which define their "heimat" or homeland. Includes a competition on the best submission which best reflects the meaning of the word homeland. The first place prize is a free trip to Castle Tollet in Austria!

- \* Archivists Daybook (<http://www.tulane.edu/~lmiller/Daybook.html>)

An extensive calendar of events of interest to archivists.

- \* Art Scene: The Guide to Visual Art in Southern California  
(<http://artscenecal.com>)  
Provides Gallery and Museum listings, Southern California Maps, Articles, an Image Bank, a Calendar of Openings and Special Events, and a Users' Forum.
- \* Australian Archives Electronic Records Policy  
(<gopher://aa01.aa.gov.au> - then select "Austrialian Government", then select "The Australian Archives," then select "Electronic Records.")  
Provides access to five papers on electronic records management giving the view downunder.
- \* Bailey, Charles W., Jr., "Network-Based Electronic Publishing of Scholarly Works: A Selective Bibliography"  
(<http://info.lib.uh.edu/pr/v6/n1/bail6n1.html>)  
Bibliography with hypertext pointers to: Directories; Economic Issues; Electronic Books; Electronic Serials; Future Scenarios; General Works; Legal Issues; Library Issues; New Publishing Models; Publisher issues; and Related Electronic Resources.
- \* Berkeley Finding Aid Project listserv -- FINDAID  
To subscribe send the following message to [listserv@library.berkeley.edu](mailto:listserv@library.berkeley.edu) "SUB FINDAID your name"  
Directed to those who are interested in an encoding standard for archive, museum, and library finding aids.
- \* Dia Center for the Arts, New York  
(<http://www.diacenter.org>)  
Includes pointers to Exhibitions, Permanent Collection, Long-Term Projects, Poetry, Dance, Publications, Arts Education, Press Releases, DIA History, etc.
- \* Digital Collections, Inc.  
(<http://www.ipac.net/dci/dcihome.html>)  
Company which "develops and markets database software that integrates images and text for the management of visual archives and physical collections."
- \* Duke University Papyrus Archive  
(<http://odyssey.lib.duke.edu/papyrus>)  
Provides remote access to information about and images of papyri from ancient Egypt. Provides a searchable online catalog and 200 images of and texts about the collection.
- \* The Electric Postcard  
(<http://postcards.www.media.mit.edu/Postcards/>)  
Pick from among a generous supply of postcard images and "send" a copy of it with a customized message to a dear one, who is notified via e-mail that they have a postcard waiting. Images from many famous artists available.
- \* Emory Special Collections  
(<http://www.cc.emory.edu/LIB/schome.htm>)  
This department hold the collections of rare books, manuscripts, and the university archives.
- \* Edith Cowan University - Online Course in Electronic Recordkeeping  
(<http://139.230.164.31>)  
Housed within the link to the Department of Library and Information Science, this link provides an online tutorial to a formal course on Electronic Recordkeeping. This site should be just about finalizing the copyright issues so they can deliver full text of course readings.
- \* French Ministry of Culture's JOCONDE database  
(<http://gauguin.culture.fr:8099/cgi-bin/requete>)  
Online database of 120,000 paintings and sculptures from 60 separate museums. Queries can be submitted for topic, artist, location, school, and century, among others. Some reproductions available.
- \* "Gallery V (For Virtual)," Berea College Museum, Kentucky  
(<http://www.berea.edu>)  
A few exhibits, including a multimedia installation for self-guided navigation to uncover the history of the college and information on the museum itself.

- \* George C. Page Museum of La Brea Discoveries  
(<http://cwis.usc.edu/lacmnh/page>)  
Starting point for information about the famous fossil tar pits.
- \* Guide to Online Archival Exhibits  
(<http://www.wam.umd.edu/~jenanne/intro.html>)  
Provides a student research paper describing online archival exhibits, and pointers to online archival exhibits.
- \* Hands On Children's Museum of Olympia, Washington  
(<http://www.wln.com/~deltapac/hocm.html>)  
Virtual museum for children 10 years old and under. Contains lots of jump off points to kids oriented materials.
- \* Human Radiation Experiments Information Management System  
(<http://www.ohre.doe.gov/>)  
The U.S. Department of Energy's Office of Human Radiation Experiments. Includes GIFs of some recently declassified documents, current reports, and a searchable interface to the Human Radiation Experiments Archives.
- \* Indiana Historical Society  
(<http://www.spcc.com/ihs/ihs.htm>)  
Includes links to Mission Statement, Letter of Welcome, Membership information, Press Releases, Administration, Education, Library, Publications, and lecture given by Stephen Ambrose, among other things.
- \* Library of Congress, Network Advisory Committee, meeting papers  
(<http://lcweb.loc.gov/coll/nac>)  
Provides full text of Proceeding of NAC meetings for 1994, including "Beyond the Internet: The Transition to the National Information Infrastructure," "Community Connections: The National Information Infrastructure and Civic Networks," and "Network Content: A Dialogue with Publishers."
- \* Museum Collections and the Information Superhighway: Conference paper abstracts  
(<http://www.nmsi.ac.uk/researchers/confabs.html>)  
Collection of abstracts of seven papers given at the conference, hosted by The Science Museum of London. Titles include "The Digital Superhighway and the Curator," and "Virtual Teaching Collection."
- \* Museum Computer Network -- Annual Meeting of the American Association of Museums  
(<http://www.libertynet.org/~mcn/>)  
Includes offerings from the AAM's 90th annual meeting, including summaries of talks by Jane Alexander, David McCullough, and John Chadwick. Also includes a link to AAM Expo Dinosaur gallery.
- \* Museum Informatics Project - University of California, Berkeley  
(<http://www.mip.berkeley.edu>)  
This project seeks to "coordinate the application of information technology in museums and other organized, non-book collections." This site's home page contains links to About the Museum Informatics Project (MIP), Museum Informatics Standards, Museum and Nonbook Collections at the University of California, Berkeley, Collection-Related Online Information Resources, and What's New.
- \* Museum of the City of New York  
(<http://www.netresource.com/mcny>)  
Includes pointers to General Information, Current Exhibitions, Museum Collection Sampler, Copy Prints Available, and A Word From The Director.
- \* Museum Online Resource Review  
(<http://www.okc.com/morr/>)  
This site provides an annotated directory of "WWW, gopher, ftp sites, email lists and newsgroups" of interest to museum professionals.
- \* National Endowment for the Humanities  
(<http://www.neh.fed.us>)  
This site provides links to About NEH, What's New, The National Conversation, 1995 Overview of Programs, Application Guidelines, and Administrative Information.

\* National Museum of American Art

(<http://www.nmaa.si.edu>)

Provides links to research resources (including searchable research databases of the NMAA's holdings, as well as the Smithsonian Institution Research Information System), galleries, education programs, museum departments, publications, special exhibitions, etc.

\* Ohio State University Excavations at Isthmia, Greece

(<http://www.acs.ohio-state.edu/history/isthmia/isthmia.html>)

This site provides access to information about the Sanctuary of Poseiden at Isthmia. Included are links to The Roman Bath, The Preliminary Report on the 1994 field season, the Pottery Dump, Fieldwork Opportunities, the Excavations at Isthmia Multimedia Program, as well as links to other archaeological WWW sites.

\* Online Archaeology: An Electronic Journal of Archaeological Theory

(<http://avebury.arch.soton.ac.uk/journal/journal.html>)

Currently existing as an experimental journal, the creators hope to transform it into a formal refereed periodical "with the aim of promoting rapid dissemination of speculative ideas about archaeology."

\* Palmer Museum of Art at Penn State

(<http://cac.psu.edu:80/~mtd120/palmer/>)

Winner of the 1995 Best Research in the Arts and Humanities at Penn State, the Palmer Museum of Art's WWW site offers links such as The Galleries at the Palmer, The Palmer ONLINE Catalog, A Guided Tour through the Palmer's American Painting Collection, A Museum Learning Activity with the Portraits of John Sloan, History of Collecting and Exhibiting of Art at Penn State, and a hypertext of a master's thesis entitled "What Does it Mean for an Art Museum to Exist Online?"

\* Petersen Automotive Museum

(<http://cwis.usc.edu/lacmnh/petersen/>)

Yes, this really is a museum about automobiles. Located, of course, in Los Angeles. And why not!

\* The Science Museum, London, England

(<http://www.nmsi.ac.uk/Welcome.html>)

Includes links to items such as Resources for Researchers, Collections and Galleries, Visitor Information, Education at the Science Museum, Temporary Exhibitions and Events, and Links to Other Museums and Sources of Information.

\* The Smithsonian Institution

(<http://www.si.edu>)

Opened May 8, this site won the Global Network Navigator Best of the Net Award for its online Ocean Planet exhibit in its first week online.

\* Texas Natural History Collections

(<http://www.utexas.edu/depts/tnhc/www>)

Among other things, this WWW page provides links to Ichthyology, Herpetology, Non-veterbrate Organisms, and Geology. Several searchable online databases are available as well.

\* Texas State Archives Confederate Pensions Database

(<Gopher://links.tsl.texas.gov:70/11/dir/compt.dir>)

A searchable Gopher interface to an index to Confederate Pension Applications. It provides the "names, county of residence, and pension number of some 54,634 approved, rejected, and home pensions issued by the Texas government between 1899 and 1975."

\* University of California Museum of Vertebrate Zoology

(<http://www.mip.berkeley.edu/mvz/>)

Contains links to tissue samples, field notes, maps, photographs, drawings, and sounds.

\* Walt Whitman Notebooks

(<http://lcweb2.loc.gov/wwwhome.html>)

This page provides access to four Walt Whitman notebooks that disappeared from the Library of Congress in 1942 and which were returned this past February.

## **The ZKM "Digitale Museum Symposium" (Karlsruhe, Germany, May 20, 1995)**

The Zentrum für Kunst und Medientechnologie (ZKM) is a Center for Arts and Media Technology in Karlsruhe, Germany, designed to "foster the creative possibilities of a connection between traditional forms of art and new media technology, to achieve results which anticipate the future." The ZKM is a long term and high profile project. Its promoters don't hesitate to compare its scope and importance with the Bauhaus. In anticipation of the grand opening of its new building (set to open in 1997), the ZKM organized one of the last major milestone events of its development stage, *Multimediale 4*, May 13-21, 1995. This festival was housed in an abandoned garage in downtown Karlsruhe, prepared in a manner very suitable to address issues such as post-industrialism and digital revolution. This report focuses on a symposium on the Digital Museum that took place on May 20.

### **The ZKM's *Multimediale 4* festival**

The ZKM is a public foundation formed in 1989 by the City of Karlsruhe and the State of Baden-Württemberg. The ZKM is anything but a local project, even if strong relationships are being developed with the University of Karlsruhe and the Karlsruhe School of Design. The ZKM project includes the Institute for Image Media (led by Jeffrey Shaw), the Institute for Music and Acoustics, the Media Theater, the Mediathek, and two museums: the Museum of Contemporary Arts and the Media Museum (Das Medienmuseum) led by director Hans Peter Schwarz and associate director Bernhard Serexhe.

All of these activities will be housed in a new building, bigger than the Beaubourg Center in Paris but of the same "post-industrial" architectural style. The ZKM facilities and equipment will be made accessible

to artists, scholars, and also to the general public. The goal is to support a synthesis of creative forces in the arts and media technologies. ZKM aims at making possible the creation of "multimedia total artworks" (*Gesamtkunstwerks*) as well as promoting new technologies, and "providing critique of a blinding media euphoria." Permanent staff of the ZKM is about 40 and will increase to 60 in operating mode, not counting visiting artists, scholars, and scientists working on the basis of limited-term contracts, commissions, project sponsorships, or stipends, connected to the production or within the scope of the art prizes awarded in the Museum Forum of ZKM.

The Museum of Contemporary Art (Das Museum für Gegenwartskunst) wants to become a museum for all art genres, including media art. The *Multimediale 4* exhibition was an opportunity for showing some selected pieces from its "Fin de siècle" collection. Piero Gilardi's electronic sculpture "Vitigni danzati" is composed of two simulated grape trees made of aluminum and iron, with a polyurethane foam body covered by latex rubber. The experience is a 3 minutes performance of motion and lights, overlaying a sound track. It's not very interactive, except that you can leave when you get bored! Several video installations by artists Wolf Kahlen, Wolfgang Staehle and Gary Hill were presented, as well as Dietr Kiessling's closed circuit video installation: "Swinging television." A video monitor is hooked to the ceiling with four wires, with a black dot painted at its center. A video camera plugged in the swinging monitor is placed in front of it. One can see a video moving dot on the screen that briefly hides behind the painted one each time the monitor pass just in front of the camera. The idea is to emphasize that when we perceive moving images on television, we are not aware of the monitor as an object itself. Two "structural environment" sculptures by artist Thorbjom Lausten were shown: "Reflector" and "Flame." Bill Viola presented his "Threshold," an installation made for looking "behind the text," recognizing the world of language as a "fleeting surface." Finally, Jeffrey Shaw offered an interesting experience in the "Heavens gate" video installation: a room whose ceiling is made of moving video projections inspired from Baroque frescoes. The floor is in fact a mirror and when you enter the room you find yourself floating in a "vertiginous axis between an above and a below that has lost its qualitative distinctions." This is an experience that one could expect to be less impressive

than most of the video games, but actually young kids seemed to be a bit scared, or at least emotionally sensitized.

For Hans Peter Schwarz, director of das Medienmuseum (The Media Museum): "our liberation from the myth of nature has merely been replaced with an even more serious dependence on the myth of technology." In his review, the history of new media is inevitably linked with the history of modernity as a whole, and it should be described as the history of the human experience of reality, as well as the evolution of social relationship to reality. This led to the establishment of the Media Museum, whose aim is to give the public the keys for understanding more about the potentials of technology, by explaining the technological concepts behind information. The "deconstruction" of media technology will be a major focal point in the museum. The main exhibition space will give a historical perspective of the development of new media, centered around narrative environments from Alan Turing's calculating machine to Virtual Reality. Since the ZKM concerns are bound to the always evolving technology, the Media Museum wants to be a "museum-in-progress," a media forum in which encounters, informative lectures, entertainment, and serious expert discussions all have their place.

The Digitale Museum symposium and the multimedia exhibition, the "mediengeschichten," were conceived as a preview of the museum. Four installations from the permanent collection were shown. Frank Den Oudsten's "Platos Schatten" is a very aesthetic installation of ten steel sculptures with a shape of a dummy holding a video tube. These screens present film sequences, and the whole installation enables visitors to experience the history of simulation, spanning from the deconstruction of the human body in the Renaissance to the construction of digital personalities in the present. Jill Scott's "Frontiers of Utopia" installation is discussed later. A third artist's view on the new media for the Media Museum is the amazing "Orbispictus" by Van Tijen and Vojtechovsky. It is based on the 1658 work "orbis sensualium pictus" by the Bohemian humanist Jan Amos Comenius. The modern piece is an interactive and multifunctional installation. At first sight it looks like a futuristic "cabinet of curiosities," with amazing objects on display around a circular shelf that seems to float in the air. Inside this open ring are three interactive "activity stations" (an appellation which seems to be more

appropriate than "kiosks"). At this point only one of them is operational, and even if the content is -- so far -- only in German, its operating mode is as simple as it is impressive. The museum-goer is offered a set of objects (animals, tools, a hand, etc.) displayed on a table in front of a computer. The center of the table is lit. When you place one of the objects under the light, the computer screen plays a related informational sequence. The fourth installation, "das virtuelle architekturmuseum" is an idea of Hans-Peter Schwarz that has been produced by Bernhard Serexhe. The visitor navigates through not-realistic reproductions of actual buildings. The installation seeks a new sensuality in virtual spaces, playing on the connection between traditional drafting techniques and computer generated possibilities for movements. This "virtuelle architekturmuseum" offers paradigmatic illustrations of various concepts of space, "from the first huts up to deconstructivism".

### Das Digitale Museum Symposium and the night cafe discussion

Almost 500 people attended the digital museum symposium. Among them 50 German professionals who were in Karlsruhe the day before, for a meeting of the Baden-Württemberg lander's association "Museumsverband." Their president, Karl-Heinz RUESS welcomed us by saying that little is known about interactive multimedia for museums. He noted that multimedia is not only a technological matter, but also requires a lot of staff in preparation and maintenance. He decried the emergence of such interesting opportunities at a time of reduction in most museums' budgets. However, he also expressed a hope that new technologies could be a means for reaching new publics, notably the youngsters. He hoped the attendees would discuss the full implications of interactivity, not forgetting the negative and undesired effects: "Will the exhibition become a second priority? Will new technologies attract new visitors and make them realize this is not the real experience? How will the museums enable visitors to ask questions?. He concluded that the ZKM museums, even without buildings yet, are already showing what meaning could be with interactivity.

Hans-Peter Schwarz presented the speakers and expressed the hope that the symposium would answer the fear that new technologies would overwhelm us with images "without content." He also talked about the reluctance of existing museums to welcome interactive or technology-

based artworks (reminding the audience to think about the delay it took for photography to be accepted in museums). Mr. Schwarz noted that some artists are not comfortable with the idea of showing their work in a museum context. On this question he reminded us that the ZKM is planning to establish an Interactive Art Gallery, and he underlined that, in our mediated world, museums could maybe one day provide the last chance for experiencing reality. His talk was followed by a very well-directed video film about the history of interactivity, "Bilder von der Rolle," produced by the ZKM.

In the next session, the artist Jill Scott served as the moderator. She first introduced Friedemann Malsh, curator at the Musée d'Art Moderne et Contemporain, Strasbourg, France. He is a German citizen, recently hired to lead a French museum, a situation very new and encouraging for Europe, and an illustration of the French-German bond that has been dramatically strengthened under Mitterrand's presidency. Friedemann Malsh read a paper on the curatorial perspectives for video art which made a clear distinction between video art and video as media in the museum. His talk was a bright theoretical development, and one can expect Mr. Malsh to have a fulfilling career in his institution which was an initiator in considering new media at its very inception.

I opened with a joke about a mistake in the program that announced I was an art historian. My suggestion to the attendees was that, if they were really expecting an art historian's point of view, they should ask the person seated next to themselves, since with this audience the probability she or he was an art historian was very high. A second joke conveyed my most recent thoughts about interactivity in museums. I gave a brief description of a system that could have an interactive relationship with the audience, whether for this conference or in a museum public space, called the Consensual Fantasy Engine which was recently developed at Carnegie Mellon University by artist Paul Vanouse and computer scientist Peter Weyhrauch. Noting the difficulty of giving a clear definition of interactivity, I asked my portable computer, which answered (through its sound card): "Hi! I'm Marshall Macintosh-Luhan. I've never seen you before. Are you new here? The medium is the message, and interactivity is, and interactivity is, and interactivity is... Sorry, can't get it. please reboot. But there is little doubt that the ZKM

will eventually become a brilliant and successful example, setting up new standards in the domain. Please reboot. Prompt."

After this purposefully disconcerting start, I said it is now obvious that there are potential multimedia applications in every activity of a museum:

- (1) Almost all the major museums have started or plan to use collections management software.
- (2) In Europe, we have some big plans to provide museum professionals and searchers with multimedia tools and telecommunication methods.
- (3) Two years ago we identified 99 museums in France with multimedia applications or projects for their exhibition.
- (4) Electronic publishing is becoming a reality. About 2,000 copies of the Louvre's new CD-ROM are sold every day in its French version.
- (5) With the Internet in fashion, there is a lot of hype about online searches based on cultural heritage.
- (6) Leading edge centers such as the ZKM, or the Studio for Creative Inquiry (Carnegie Mellon), are developing specific Virtual Reality applications for museums. And museums all over the world are involved in many research programs on information technology.

I noted that since everything is said to be interactive nowadays, the word "interactive" is losing its meaning. At the same time the concept of interactivity spreads over all kinds of information systems for museums. A strong need remains for notions of interactivity that would help us design and produce some great multimedia. I reminded the audience that multimedia-based interactivity in museums is not only electronic access to digitized representations, and that interactive applications should not only be pleasant jukeboxes. The World Wide Web is not a panacea. It's not even that interactive. The fascination comes from its being online and therefore operating in real time. Despite some interesting examples that David Wallace has mentioned in his previous papers, using the Web is like walking a library in which you would see nice book

covers. We still have to work hard, and to learn a lot, if we want the user get an experience closer to visiting a museum rather than paging a book.

A clear way of thinking about multimedia applications in museums is still to keep in mind that a computer is a meta-medium, a representations-making machine. User-friendliness is only the visible part of the iceberg of interactivity, since interactivity links the user with the authors in a communication process. From my most recent research, I have submitted three general analysis criteria about interactivity that I hope will be useful in better understanding and the design of applications in museums. The following is a brief description of what might be developed in a forthcoming publication:

First, be aware of the social space and time in which the application will be used. It might be in a private or a public space (home/school/museum), alone, or in a collaborative process, on leisure or working time.

Second, do think about the way the user's senses will be solicited by the media. How will his or her body will be linked to the system installation? This second idea is the outside edge of the so-called human-machine interface.

Third, consider the inside edge of the interface: the intellectual relationship between users and authors. In my mind there are three main operating modes of that relationship; they go from documentation service to immersive narrativity, not forgetting the simulation process.

A few years ago our concern was about technology itself, now we focus more on the content. We have to make the distinction even more clear between the container and the content. And we must not forget that the only way of getting the meaning of the content, so far, is through the experience. In my opinion, museum professionals, as well as media professionals, should only worry about what the experience of using the application will be when they design one. Technology and content structuring matters can be dealt later with technicians as a consequence of the design. During my talk, I showed several real examples from the United States: the ViewPoint kiosk at the Seattle Art Museum (Continuum); the new San Francisco Museum of Modern Art interactive pieces ("Making Sense of Modern Art," produced by Peter Samis), the San

Francisco Asian Art Museum "game-like" kiosk that enables kids to visit a tomb (Haukman Associates); the interactive Encyclopedia of the U.S. Holocaust Memorial Museum (Yechiam Halevy); and, finally, the Networked Virtual Museum developed by Carl Loeffler at the Studio For Creative Inquiry, Carnegie Mellon University.

Barbara London, curator for media art at the Museum of Modern Art in New York, reported on the difficulties of integrating new media in the museum. She compared museums to old ladies who might accept some change, but very slowly, at their own pace. London gave a well-documented historical overview of video installations and some interactive pieces (one with performance artist Laurie Anderson) that she produced in the past few years.

A brief panel concluded the morning session. The first question from the audience was about the reluctance of museums to accept new media art works, the person wondering if this was going to be similar to what happens with video art. While I suggested that there was a distinction because video art is made of time-based media, Barbara London felt she was reliving the problems she encountered at the beginning of video art. Friedemann Malsh added that this is a repetition of reception of new image technologies in the late 19th century. Another question was about the possibility people will have to access mediated new art forms from their homes. I answered that one should make the distinction between the communication activities of the museums, such as electronic publishing, and the museum as a place that provides visitors with a special experience. My assumption is that museum will have to endeavor to provide an irreplaceable experience.

Australian artist Jill Scott opened the afternoon session. Her speech, "If Memory... then Multimedia Fantasy," was based on her interactive work, "Frontiers of Utopia" at the ZKM. She explained that she had the original idea of the installation when she was at her grandmother's place and found herself looking at the object and thinking at the same time both about the past, and people from the past, and about the future. The work itself portrays eight real women and their stories from four different generations in the 20th century. The visitor is given an infrared head-phone set when entering, and can select one of five audio channels. In the exhibit space, four video projectors play enacted video sequences in

response to what is chosen at the interactive station underneath. The content consists of documentaries as well as computer animations and sound recordings. Each of these stations presents a couple of women, from four different periods: the 1900s, the 30s, 60s and 90s. With a touch screen, one can choose specific sequences about each woman's life. Sometimes a character offers to start a dialog by asking questions the visitor can answer by touching "Yes/No" buttons. In front of each touch screen, a suitcase is open, mixing representation of symbolic personal objects from the women. Touching an object with a real metal key chained to the screen gives a specific multimedia explanation about it. In a corner of the installation space, a special old radio set enables the user to surf over the timeline from the mentioned periods, showing main concepts and related symbolic objects. Finally the most impressive part of the exhibition is the "family diner", in the center of the room. Underneath a computer monitor, a picture is printed on a table, showing all the characters having dinner and looking at the user. One can select any two of the women, from any period, and then see them having a dialog. The realization, both for content or technical consideration, is of first quality showing Jill Scott's talent as well as the very demanding standards the ZKM has chosen for its productions. Visiting this installation is a truly new kind of an experience that sets a new standard for content-based interactive installation.

Roy Ascott, director of the Center for Interactive Inquiry into the Visual Arts at the University of Wales, gave another artist's point of view with his paper, "Telematic Culture and Artificial Life." He presented different theories on the concept of media art, and examined the impact of these theories in practice. He has built his concept of "cyberception" on our behavior in architectural spaces (such as museums). It led him to suggest that "Digital Museum" is an oxymoron since existing museums have qualities such as solidity, stability, and permanence that are absent in the digital world. Roy Ascott developed his views of what a digital museum could be: a creative and active place open to the future rather than, as he put it, a passive place about the past. Although it was not tied to the reality of existing real museums, his talk was very brilliant and sufficiently subtle that most of the attendees will be delighted to see it published.

After a coffee break, Myron Krueger completed the artists' point of view by presenting his previous interactive works. He was as entertaining as he was during ICHIM'91 in Pittsburgh, but further developed his theoretical reflections on artificial reality in a talk entitled "Interactive Art: Reintegrating the Mind and Body." Krueger showed some tapes about his well-known artwork, "Video Place," and a more recent realization titled "Full Planet" which is another full-body interactive installation in which one can fly over a small colored planet looking like earth, moving from place to place by spreading and bending one's arms.

Monika Fleishman, a VR artist and the Director of the VR research department at GMD, Bonn, gave a paper on "The Internet as a Digital Muse." The examples she showed are difficult to describe as they were extremely faithful to reality. The fluidity of traveling within the (museum-based) worlds she has been developing is of a quality never before seen in desktop virtual reality. More than one Internet surfer was astounded to hear that the GMD plans to make this technology available on the net very soon. The common opinion was that it would not be possible unless the bandwidth of Internet connections is extended. At the very least, this presentation was both impressive and imaginative and I hope I'll be able to report further details about it in the future.

Axel Wirths, curator and director of the 2 3 5 Media Gallery in Cologne, closed the session with a paper on "Digital Dreams between Pretension and Reality." It was not surprising that many of the issues he wanted to address in his paper had been mentioned by the other speakers. He decided then to modify his talk, cleverly summarizing what had been said and referencing his points to previous presentations.

At 10:30 pm a more informal meeting between all the speakers and the audience took place at the Mulimediale 4 bar. This bar featured an "electronic cafe" that had been very successful during the whole festival. It was made of six Philips stations with a free access to the Internet, and the opportunity to exchange messages with other participants. Cynthia Goodman former director of the IBM Gallery in New York, joined the discussion and said how important it was for her to see that the solutions she experienced a few years ago were on track now for other museums. I observed that what was done at the IBM Gallery was still an example

for the great majority of museums, but she was sorry to answer that this gallery is now closed and the building was to be sold.

This night discussion didn't raise many new questions, but it was a great opportunity to answer questions from motivated participants. An art critic said that interactive art was suffering the lack of critic and wanted to convince the artist that the more tough his critics were, the better their works would become. As a response, Myron Krueger urged the artist not to listen to the critics. Another attendee asked the panel what would be the counterpart we will need for electronic networked museum. She said that since using e-mail gives her the desire to meet the real people, she was wondering what place we would be needing after net surfing in digital museums. Conservators were apparently happy to answer that the real museums and galleries would be the places. I suggested this might pertain only as long we were speaking of web sites with representation of museum holdings. But what about Virtual Museums built in response to our queries from distributed artifacts, and, indeed, some virtual objects? So far, our museums have been built for collective use, but digital technology will also allow us to have personal virtual museums our own like cultural differences or personal tastes.

I felt a need to clarify the dual issues we had been discussing all day long: multimedia as a means for museums and multimedia as a technology for artworks. I was surprised that the dominant idea was that interactive multimedia technologies would transform museums into creative places like those described by Roy Ascott. It seemed to me that even if this could happen with contemporary art museums, they were only a small part of the whole world of museums. Ascott said he spent two days with colleagues trying to find new names for such a place, but all they could agree on was either "Center" or "Museum." Some participants began to doubt the necessity of having museums in the future, suggesting instead that we better need galleries, electronic cafes, and creative centers. As a welcome conclusion, Hans Peter Schwarz declared, "if you want creative galleries, do creative galleries, if you want electronic cafes, do electronic cafes, but I do want a museum, we need museums, especially for VR pieces for which museums might be the only place."

## Meeting with Bernhard Serexhe

On Sunday, I met with Bernard Serexhe, associate director of the Media Museum for a brief interview.

### Xavier Perrot: **What is your policy for gathering the Media Museum collections?**

Bernhard Serexhe: Our intention is to have museographic installations about media that are realized by artists. We need strong personal visions on the subjects raised by the media. We are also interested in seeing how the traditional art forms, such as sculpture, appropriate the new technologies. Of course, sometimes the criteria are not absolutely categorical and a same piece could be part of our collection as well as part of the Modern Art Museum. For example Toshio Iwai's piano. (An interactive audiovisual installation which combines a real grand piano and computer-generated moving images on which the users can place dots with a trackball. These dots will eventually be played as notes by the piano and then be thrown away as graphic objects over the top of the keyboard). But once more, our main subject is the deconstruction and understanding of the media, not the display of media artworks.

### Perrot: **What about the electronic publishing products, such as CD-ROMs, and video games?**

Serexhe: The ZKM centers will include an important Mediathek, using 1/5 of the facilities surface. As for video games, our Media Museum will feature a specific exhibition space of one thousand square meters. Of course our approach will be critical and pedagogical, not moralizing, but with the aim of enlightening the evolution of social perception and personal relationship to the electronic games.

### Perrot: **What do you think about the "Digital Museum Symposium?" Was it the first conference the ZKM organized on the subject?**

Serexhe: We organized a similar symposium in June 1994, but it was a smaller event since it didn't benefit from the Multimediale festival dynamic. What was interesting in the 1995 symposium was the diversity

of approaches, from art historian to artists and scientists. If the discussion sometimes deviated from the straight submitted subject, that is where it found its richness. It is OK that the discussion remained open, since the ZKM wants to remain an open-minded place.

**Perrot: What are your relationships with the U.S. organizations?**

Serexhe: From its beginning, the ZKM has been seen as an international collaboration center, aimed at becoming a worldwide point of reference. We have common development projects with the MIT MediaLab, and we have relationships with the Computer Museum in Boston, the Exploratorium in San Francisco, and the Museum Of Modern Images in New York.

**Perrot: If a U.S. institution or individual wishes to know more or to evaluate any possibility of collaboration, to whom should they talk?**

Serexhe: They should not hesitate to call me at (49+) 721 9340 414, send a fax to (49+) 721 9340 59 or e-mail me at serexhe@hermes.zkm.de. By the way, I will be traveling in the United States soon and would be delighted to learn more about similar initiatives or approaches that might have been developed there.

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## CONFERENCE CALENDAR

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♦ **July 26-29** Raleigh, NC, National Association of Government Archives and Records Administrators Annual Meeting [Steve Grandin, NAGARA, 48 Howard St., Albany, NY 12207; 518-463-8644; fax 518-463-8656]

♦ **August 24-26** Montreal, Canada, Assoc. for History and Computing [Jose Igartua, Dept. of History, Univ. de Quebec, PO Box 8888, Station Downtown, Montreal, H3P 3P8, Canada; 514-987-8312; fax 514-987-7813; email: igartua.jose@uquam.ca]

♦ **August 29-Sept. 3** Washington, DC, Society of American Archivist Annual Meeting [SAA, 600 S. Federal, Ste. 504, Chicago, IL 60605; 312-922-0140; fax 312-347-1452]

♦ **September 7-9** Saratoga Springs, NY, American Association for State and Local History Annual Meeting [LuAnne Sneddon, AASLH, 530 Church St., Ste. 600, Nashville, TN 37219; 615-255-2971; fax 615-255-2979]

♦ **October 9-13** San Diego, CA, International Conference on Hypermedia & Interactivity in Museums '95/Museum Computer Network '95 [Lynn Cox, Archives & Museum Informatics, 5501 Walnut St., Ste. 203, Pittsburgh, PA; 412-683-9775; fax 412-683-7366]

♦ **October 22-25** Nashville, TN, ARMA Conference [Association of Records Managers and Administrators, 4200 Somerset Dr., Ste. 215, Prairie Village, KS 66208; 800-422-2762 (US) or 800-433-2762 (Canada); 76015,315@compuserve.com]

♦ **November 5-7** Alexandria, VA, Not-For-Profit Conference & Technology Expo [Telecommunications Cooperative Network/Center for Strategic Communications, 2101 Wilson Blvd., Ste. 417, Arlington, VA 22201; 800-669-4826]

♦ **November 6-8** Chicago, IL, 1995 National Conference on Managing Electronic Records [Cohasset Associates, 3806 Lake Point Tower, 505 N. Lake Shore Dr., Chicago, IL 60611-3407; 800-200-7667; fax 800-FAX-7667]

♦ **November 6-10** Edinburgh, Scotland, Museum Documentation Association International Conference [MDA, Lincoln House, 347 Cherry Hinton Road, Cambridge, CB1 4DH, UK, +44-223-242848; fax +44-223-213575]

### **Coalition for Networked Information, Spring 1995**

The Spring Meeting of the Coalition for Networked Information Task Forces took place in Washington, D.C., April 10-11, 1995. The theme was the Digital Library, which was especially reflected in the plenary sessions.

In the opening plenary session, Stephen Griffin (National Science Foundation) and Paul Hunter (NASA) delivered very dry overviews of their agencies' objectives in the Digital Library Research program in which I did not detect anything new. Glenn Ricart (Advanced Research Projects Agency) gave a much more animated presentation on ARPA initiatives, especially on how to do business on the I-way. He suggested that new applications were needed, but that ARPA was mostly interested in basic utilities like authenticity, transcription of voice, gracefully transmitting large documents over slow links, how to make latency disappear by asking for things before they are needed, and support for natural language queries. He described ongoing efforts funded by ARPA involving software brokers/agents/managers, extensions to the network, grants to develop technologies to demonstrate in testbeds, interoperability mechanisms and protocols, and mechanisms for locating documents, shared objects, document translation, scaleable registration and recording systems, and rights management systems. Ricart particularly stressed the need for separation between layers of registration and rights clearance identified in the Computer Science Technical Reports Project and the architecture which CNRI has proposed in its electronic copyright registration project with the Library of Congress.

Ricart's talk led directly into the next paper by Bill Arms (recently moved to CNRI, from Carnegie Mellon University). Arms discussed planning for the future of the NII and why the WWW is not it! He also noted that while the Digital Library Initiative has started with great expectations from the community, it may be disappointing, while the Computer Science Technical Reports (CSTR) Project which was undertaken with low community expectations is doing great things. Unfortu-

nately, little has been said in public about the project because Robert Kahn and Robert Wilensky have a position paper that has been in draft forever. Arms noted that 3 of 6 winners of Digital Library Initiative grants were CSTR participants. He pointed to products of the CSTR including "Dienst," the Cornell distributed search system, "GLOSS," a system for discovery, and Lycos, the CMU software for cataloging the Internet which has indexed 2.8 million pages on the WWW to date. But the most important work, according to Arms, is the concept of a "handle server" and the related architectural ideas. Arms pointed out that the basic questions have always been what issues must be resolved before a Digital Library is possible:

- (1) Legal issues such as copyright/performance and property; libel and obscenity; communication and common carriers; national and international dimensions require a respect for the rights of creators and a clarification of the boundaries between parties.
- (2) Architectural issues such as consistent content definitions for naming and security, with other aspects of content depending on context. Arms noted that location-independent naming is essential and that the current concept of URLs, therefore, won't do. Names must be globally unique, be persistent across time, be fast resolving, be decentralized in their administration, support change control, and be supported from standard user interfaces.

The Handle-Layered object metadata model developed by the CSTR has five layers:

- Handle
- Properties
- Transaction Log
- Contents
- Signature

The proposals advanced by Arms were designed to ensure that digital library objects will not simply be copied or replicated (as in file transfer) but that they will be fully declared in a way that enables them to be operated on and rendered by sophisticated means. For example texts might be rendered in SGML, musical scores might be played, video games and computer programs will be executed. In other words, what

the user sees will NOT be what is stored. What users want is not collections of bits but contextually meaningful intellectual entities. Arms noted that many of the discussions of metadata (such as those under the auspices of RLG/CPA) are attempts to create rules for digital library objects and means for their retrieval. These, he believes will fail. In this Arms has reached the same conclusion that I have about archival records: functionality may be important and must be defined when the object is stored.

As usual, the following sessions provided an opportunity to follow up on many projects in depth. These included the Stanford and Michigan Digital Library initiatives, ISI's Electronic Library Pilot, the Heinz Electronic Archive (HELIOS), the National Engineering Education Delivery System (NEEDS), and the Electronic Dissemination of Journals and technical reports on college campus networks. A short briefing paper on each of these topics is available from the cni server @cni.org. I participated in a session on the National Initiative for Networked Cultural Heritage (NINCH).

In that session, John Hammer (National Humanities Alliance) discussed the current need for NINCH. He noted that when the NHA was formed at start of Reagan administration, the NEH was being challenged, but that the mood was different from today. NEH wasn't really targeted for ideological reasons then, while today it is. George Farr (NEH) described NEH staff planning for the digital future. A "Special Technology Initiative" (\$4M) was formulated as part of FY 1996 budget request. He noted that NEH has long history of supporting technology based humanities research, citing funding for the Art Information Task Force, Consortium for Computer Interchange of Museum Information, University of California Finding Aids/SGML project, the Yale and Cornell digitization projects, Duke's papyri program, and the Dead Sea Scrolls projects. Farr then described a joint co-operative agreement between NEH/NSF on cooperation in digital projects in humanities and social sciences and reported that NEH will now participate in the second round of the DLI. This will broaden the range of institutions that can apply and include NEH in the evaluation. It was clear that if the NEH survives as an agency, its focus will increasingly be on the digital future. In wrapping up the session Doug Bennett (ACLS) and I (speaking on behalf of the

Getty Art History Information Program) gave arguments for NINCH from the perspective of two sponsors of the NINCH initiative.

In the second afternoon session I could have attended updates on OCLC's project to catalog Internet resources, the Morino Institute, or the IBM Vatican collaborative, but attended the session on the Museum Educational Site Licensing (MESL) Project as a member of its managing committee. After a brief introduction by project manager Jennifer Trant, the session heard papers by a university and a museum participant.

Sally Promey (University of Maryland) described MESL as an opportunity presenting challenges for collaboration in technology ventures within and beyond the university. She stressed the opportunity to learn how the technology could transform scholarship and teaching and the benefits of demystifying technology for humanities faculties. She noted that MESL provides universities with a context and forum for considering transformational issues and the potential for educators to liberate themselves from the traditional two slide carousels approach to presenting visuals which limits the lecture to preselected material which is neither seen at the right scale nor in context. As an exploratory learning environment, MESL could be a carrot to entice faculty to become familiar with wide range of computer technologies.

Dr. Promey also emphasized the opportunity to work out enormously complicated and important copyright issues which have to be resolved because copying university slide libraries will produce poor quality reproductions without adequate documentation, even if it was legal. She was excited by the possibility that the MESL project might be extensible for a large numbers of institutions: "If all museums could participate, how rich it would be!" Of course, she noted that humanists need access to collections from many institutions from around the world and that this challenge had yet to be met in the MESL design. But even getting high quality U.S. museum images, rather than the sort that many commercial services might provide, would be a start.

On behalf of his audience, Steve Dietz, (National Museum of American Art), asked what do museums want and what do they fear? Computerization in museums is nearly twenty-five years old, but it is still relatively novel to make computerized resources available to a remote

public. NMAA now has databases like the Index to American Paintings and the Index to American Sculpture available on Internet and provides access to its curators through America Online and the WWW. Still, he noted, the quantity of repurposing and "hand-work" required to use information is amazing. The opportunity to work with universities is one of technology learning.

Why do it? In addition to fame and fortune museums want their holdings known and studied. They have some fears however. Can quality be ensured appropriately? How can integrity of the data describing the object and its attribution be protected? What are the best ways to provide for reusability of content, ease and transparency of use, two-way interaction with faculty and students? What can be done to protect intellectual property from the porous boundaries of the university? Will provision of access of this sort cause the museum to be seen as a content cow, and downgrade its interpretative role?

In the first plenary session on Tuesday morning, Cliff Lynch discussed the status of the white paper being authored by the CNI task force on Networked Information Discovery and Retrieval (NIDR). The project was initiated in October 1994 with the objective of identifying the most interesting areas of current best practice, framing the major research problems, identifying areas requiring synthesis between different perspectives, identifying areas for standards work, and defining architectural points at which pressure would be useful. The team is running rapidly to stay in place; but will try to get something out for discussions in late spring/summer with revision in time for the fall (Portland) meeting.

As they define it, discovery is a deceptive word involving searching for candidate resources, organizing them to see how they work, ranking, and defining methods of search. It is, in fact, a research sub-process in itself. Retrieval is also a loaded term, since it has traditionally been a narrow concept limited to transferring a file but actually involves making use of the resource with an application and interaction tools to use the content. The goals of the NIDR project are different from those of the DLI projects. NIDR accepts that the world is what it is -- a rapidly growing collection of "aggressively autonomously managed" resources. The NIDR problem is to deal with this real world, while most of the DLI

work is "consciously architected" and tries to build specific information spaces.

So far navigation instruments have been developed after the fact; Cliff hopes we can develop these built into the design. So far retrieval systems have been able to live without ranking but the new environment is one in which radical ranking is required. Discovery minimally involves ranking and duplication removal. NIDR accepts that tools define information spaces (like newsgroups, the Web, gopherspace, etc.) within which objects are reasonably homogeneous. Generations of such spaces are replacing each other (thus far with backwards compatibility, but probably not for long). Other NIDR concerns include how to retrieve given the mixture of free and for-fee information and the need to clear access. One of the implications is that retrieval protocols will need to become richer than the ftp models of the past.

The next speaker, Mike Schwartz (Principal Investigator of the HARVEST project and a leader of the IETF committee on resource discovery) elaborated on Cliff's observations. Specifically he noted that existing tools work for only one access method, lack "community/topical" focus; have poor scaling characteristics, provide unstructured low quality data retrieval, and employ hard-wired search algorithms. HARVEST, Schwartz asserted, addresses each of these drawbacks. In HARVEST, "gatherers" are located at various sites, "brokers" collect the information from gatherers, and "clients" access brokers. Other components are "replicators" and "caches." Caches deal with popular objects. The replicators deal with the problem of popular services so that multiple machines can be used. Both replicators and caches are network-aware and react to actual use levels and profiles. As well as being efficient at gathering data, brokers are topically focused and customizable software extraction is enabled.

In HARVEST, gatherers run under the aegis of an administrator who puts together a list of URLs. The gatherer agent summarizes objects by types, uses a "selected text" extraction (vs. WAIS 3-11% of space needs with 95% precision and 70% of recall of WAIS) which is a customizable function based on ESSENCE program. Brokers are an index/search interface that can accommodate many other engines (Glimpse, Nebula, freeWAIS etc.). The current query interface is WWW; with customizable

results formatting, incremental update of broker contents, and duplicate removal based on cryptographic signatures of objects (unique IDs).

Between them, these two agents help solve the problems of existing architectures: each time that an object is retrieved by Archie, Veronica, or Web robots, it launches a program in the host which retrieves the totality of that host's data to build and index (throwing away the remaining data each time). As the networks and use of these searchers grows, they place a heavy burden on hosts which spend proportionately more of their time responding to these searches. The reason these tools were built that way was that the search systems needed data to be useful; with Harvest the same one off approach can be used, but once it is used the gatherer can provide it to others with resource savings of 60:1. Caching in Harvest alleviates bottlenecks from popular objects by placing copies of them elsewhere in a hierarchy of caches and can lead to 10-100 fold improvements over the CAN cache approaches. Finally, replicators alleviate bottlenecks from popular servers by periodically adapting topology based on network measurements. The goal is to be able to scale this to 10,000 replicas and an experiment in this is underway.

Future work of the team will involve integrating outside components like realm specific extractors, commercial search engines, billing and encryption systems, content markup tools, ranking schemes, and Z39.50 interfaces. Also they will architect the HARVEST tool so that integration of pieces with costs will involve charging mechanisms. [For further information <http://harvest.cs.colorado.edu>]

In the final talk of the morning, Ann Mueller (Stanford University) reported on integration of metadata to aid in discovery in Portfolio, a prototype system to facilitate the organization of the information space and the management of that information at Stanford. The Portfolio project acquires and manages context-rich information metadata for resources including an electronic journals collection, finding aids, transcripts of senate meetings, software, and text libraries which are treated as a single logical entity to facilitate discovery and consistent presentation.

Collections themselves are created by the content specialists and organized by catalogers in library. Metadata relates to bibliographic

attributes, presentation attributes, format attributes, location attributes and operational management attributes. [For further information <http://www-portfolio.stanford.edu>]

In the morning parallel sessions, we had a choice of briefings on the CMU, Berkeley and IBM Digital Libraries projects, further discussion of NIDR, the Syracuse University study on "Measuring Impacts of Networking on the Academic Environment, new technologies in humanities research, text capture at the Library of Congress, or long-term strategies for development of digital libraries. I chose the later briefing by Brian Kahin, Director of the Harvard University Information Infrastructure Project.

Kahin reported on very early stages of research that builds on prior NSF-funded work and on other CNI task force efforts and is currently funded by the Kellogg Foundation. His basic premise was that infrastructure implementation and policy development have to be done concurrently because the infrastructure will be too technical in orientation if it isn't informed by organizational, financial, and policy realities. On the other hand policy development tends to be reactive if the link isn't maintained to evolving technology. The NII, like the change in military procurement market, is not a command economy but rather one that requires government to be knowledgeable about the marketplace and its opportunities.

Kahin suggested a number of "models" or scenarios for the future. The Internet model that allows diverse services to exist within a standards framework but without regulation, the "Microsoft" model which is to seize the market with a proprietary standard, the telecommunications regulatory model which assumes control from government, and the Content or digital library model. The reason the digital library model has potential, and that he favors it, is that certain content providers can become an "essential facility" much in the way that an operating system can be. The West case and the case of MEDLAR demonstrate that if the costs of entry into the marketplace are high enough, it has the effect of monopoly. This is the reason that universities are beginning to resist buying back scholarship generated by the researchers within universities.

While I found much to argue with in Kahin's presentation, it was obvious that the project, which is focused on defining new economic and social mechanisms, will make a valuable contribution in the next few years and needs to be tracked. It will hold several invitational conferences next year.

Luncheon speaker Daniel Keys Moran, a science fiction writer and programmer did a brilliant job with this impossible speaking genre. He was amusing, provocative, and occasionally thoughtful in drawing a picture of a networked future based on extending human abilities to sense with "neural implants allowing you to do anything the most powerful computers can now do in the privacy of your own skull." Imagining the opportunity to drop someone else's experience directly into our brains, he predicted "the end of the human race," as individual lives built on personal experience. The aspect well worth further consideration is how the computer will be harnessed to sensory devices that will extend human limits of hearing, seeing, and smelling, and how much greater the implications of that are for "virtual" reality.

In the final session of the day, I was on a panel on describing image files and schedules for a flight. Unfortunately I was only able to open the session with a brief report on the Still Picture Interchange File Format (SPIFF) and run before hearing Howard Besser, J. Dustin Wees, and Jennifer Trant discuss other important issues in image documentation.

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## Digital Image Access Project, RLG Meeting March 31-April 1, 1995

At the end of March, the Research Libraries Group invited a dozen outsiders to join those who had been involved over the past two years in the initial phase of its project on digital imaging. The agenda was to review the somewhat inconclusive efforts to date and explore terms of potential future projects. The group, consisting in addition to the outsiders of half a dozen RLG staff and twenty or so project participants, met at the Holiday Inn in Palo Alto for a day and half. By design, it reached no conclusions either, but several of the papers presented and much of the discussion should be of general interest to others involved in digital imaging projects.

The meeting was introduced by Patti McClung, who stated that in her view, of all needs of arts and humanities, the greatest is the need to get online access to images. We know there are billions of images and they are almost all inaccessible. The technology to capture and display them is mostly here, but the need to index and make images available has only become more pressing thereby. The RLG Digital Image Access Project (DIAP) decided to explore what happens when multiple sources of images reflecting many different indexing traditions are searched together. Not surprisingly, McClung reported that this was the hardest and least conclusive project on which she had ever worked. Her approach has always been to get the brightest people together and give them a well formulated problem and then the solution is arrived at. In this case they didn't arrive at a solution (I suspect the problem was never fully formulated), but learned a lot. She noted that RLG's partnership with Jim Reilly (Image Permanance Institute) and John Stokes and his staff (Stokes Imaging) greatly contributed to that learning.

Anne Kenney (Cornell University) then presented a project overview drawn heavily from background papers which Jim Reilly and Jackie Dooley gave at the 1994 SAA conference. She reported that DIAP was a progeny of the Photographic Task Force which had two offspring: DIAP, which was designed to explore issues having to do with description and retrieval, and the Technical Image Test Project, which examined different formats for capture of the information in fourteen original

images using a scientific test of capture options and levels of quality. Both projects involved John Stokes who was convinced that the issues were largely not technical, but economic, social, and intellectual rather than technical.

DIAP was an inter-institutional project whose participants were selected in a competitive process in 1993. Each participant identified 1000 photographs for digitization. There were no common rules for cataloging adopted by the participants because a mix of approaches was purposefully being sought, however all the photographs were selected around broad theme of "urban landscape" so as to increase the probability of cross collection connections and to better test searching issues. The participants included the Amon Carter Museum, Columbia University, Duke University, Getty Center for History of Art and Humanities, Harvard's Francis Loeb Library, New York Public Library, Northwestern University, University of California at Berkeley, and the Library of Congress. The thousand images from each institution were digitized by Stokes in 1993-94. While there were numerous problems and delays, these were generally considered beneficial since the creation of guidelines and models for other projects was one of the important goals of DIAP.

Introducing the four topics of talks planned for this symposium, Kenney noted that they were based on most significant DIAP problems:

- (1) Purpose - why do it?
- (2) Technical options
- (3) Retrieval issues
- (4) Linkages/Discovery issues

The first paper, by Hinda Sklar, was designed to explore the "why?" Her position, Kenney explained, was that we don't yet know all of what the implications of networked access to images will be. We can't really know without experience and there are no digital databases capable of supporting research. She asked whether the digital library is a party we are throwing that no one will come to. Do we need to make a more compelling case and provide more bridges to old? If so, presentation and functionality will be critical, not just capture decisions. And making

appropriate functionality decisions will demand sensitivity to the needs of our audience.

In the second presentation, Ricky Erway (who recently joined RLG from Library of Congress) was to discuss the future and present of options. Anne Kenney believes current means for information exchange all have drawbacks, but doesn't see this as a reason for idiosyncrasy. She noted that we need common approaches, even if they are inadequate. As an aside, Kenney mentioned that she had often been asked what is use of digital image of a text by people who rightly complain, "I can't search across it," but who seem oblivious to the fact that they might just as well ask what is use of a book, since they likewise can't search for words across the text of a book.

In the third paper we were promised that Jackie Dooley would raise a series of issues relating to contextual relations between items (multi-level access) in image environments. Finally, Stephen Davis was to discuss how the data could be made available in networked environment.

Kenney observed that she sees three dimensions of the issues:

- what level of cataloging is required?
- how well does the hierarchical approach to description scale beyond one institution
- what kinds of ancillary materials are required besides images and how can we best preserve relationships among images and other objects.

Finally, she noted that there are fundamental questions about how well things scale. Out current approaches looking at how to use existing documentation or finding aids are attempting to be pragmatic, but are they effective? What impact, she asked, will SGML have?

In the first formal paper, Hilda Sklar of Harvard University imagined a researcher of the future who was interested in the Empire State Building. The researcher she described knew of six collections that would serve her needs, searches each of the six separate databases for Empire State Building, views several images from three collections together on screen, and orders them from each of three sources.

I found this model very unsatisfactory. It assumes the researcher is a highly motivated scholar, not a member of the public who really begins with the question Empire State Building. This person needs to get source material but does not know about the individual collections in which this material might reside. It is unduly demanding to expect her to search six separate databases or resort to ordering images from separate sources when the search has been completed. This model, like DIAP seems to assume that discovery is not a critical function. Sklar based her scenarios on how users now use images. But I find that these models, based on the scarcity and difficulty of getting images, unconvincing visions of the future. For example, why would we want to (or be willing to) contact three institutions for copies of their images when tens of thousands of images will be available through direct licensing? Why would we expect to need to know the collections holding images we want, or to search them individually, rather than expect a single query to retrieve all the relevant images that are available?

Granted, Sklar provided a vision of how computers can be used to search through finding tools and across collections, compares images online at anytime of day, and allow multiple users to consult the same item simultaneously. Her arguments for digital online access include management efficiency for the repository, space efficiency, and better conservation of originals.

The discussion period, moderated by Tony Troncale (NYPL), was launched with the observation commonly made by staff of the NYPL that "if you catalog it, they will come." Troncale asked his colleagues, "Are you ready for all these new users? What if they ask for it all? What about demand?" Participants from Columbia, UCB, and Duke answered that they were providing images online, but they had no real policies. They had simply been responding to opportunities and their libraries are more than a little uncertain about what the demand implications are. I noted the importance of a scaleable and sustainable model of use. Others pointed out the reality that in inter-networking and hot linking between resources, others will serve up "your" information. Steve Davis (Columbia) suggested that we need more (and appropriate) metadata and introduced the idea of the metadata encapsulated objects which was then seconded by others. Larry Viskochil noted that the Chicago Historical Society had just signed with Picture Network International (PNI) to

distribute its images, which led to a discussion of "what" to select. He and others noted that among the issues that need to be thought through are how to select collections: whether based on user needs or institution needs.

Ricky Erway was charged with giving an overview of the issues in image database projects and presented a tutorial that will be extremely valuable when it is available in print (in the Proceedings of this meeting which RLG will publish later in the year). She first observed that digital library efforts at present must be valued for the journey more than the destination, and that any project with complete answers has obsolete answers at this point.

The journey begins by acknowledging that digitization is not a way to save money, indeed it is complex and costly, but it can be made less risky by being clear about objectives. For example, if the purpose is preservation, is the goal to create a surrogate or to create a high quality replacement? If the purpose is reference access, is the goal to provide new access or to provide improved access methods and access from remote points. The purposes need to be thought of up front as they have different consequences. For the project manager, the next questions relate to what should be selected. For example, an institution might select a collection in need of preservation or one that was in high demand; presumably different success criteria would be applied in each case. An institution might decide to select specific images to capture as they are requested by users searching the database, or to capture up front an use digitized to increase demand.

Erway then discussed trade-offs involved in selection of image formats and compression methods, description standards and their implications for access (MARC-Z39.350; HTML-WWW), and playback environments including the impact on access time involved in providing images. Finally, she gave a basic overview of image and database metadata requirements including file naming, directory structures, locator files, and how these will be used by handle servers.

The practical aspects of the project require decisions about who will do the work: in-house or by contract (and if under contract who acquires the intermediary film for future protection). Quality control and the

arrangement or organization of the material needs to be planned. Determinations of how to manage the database itself, such as the delivery medium that will be used, whether to provide access online, near line, or off-line, whether to establish mirror archives and how to update, need to be addressed. Finally, access itself is an issue. Will it be online or on disk, in-house or remote, provide for searching across collections (if so what text data will be served), be accessible from WWW browsers?

Erway then addressed the issue of private sector partnerships, noting that equipment offers sound good but it is important to remember that labor costs more and that digitizing in someone else's proprietary formats is less than a gift. She urged institutions to get the added value for themselves and to retain the rights. Turning to the future, Erway envisioned incremental improvements in capture/storage with significant advances at the user end. World Wide Web refinements, including navigation improvements, improved access tools, interoperable front ends, and a decrease in costs, will accompany a quality increase.

In the discussion, Howard Besser and Anne Kenney stressed the benefits of learning, within an institution and consortially, through such projects. Standards for representation of content also need to reflect that creation of digital image bases isn't so much a one-time "publishing" function as a venture in adding value to a body of knowledge over time. Different users and uses involve multiple needs; multiple standards will need to satisfy them. It was noted that uses of images will evolve as users find ways to do things that they couldn't have done to the original.

In the next paper, on retrieval issues, Jackie Dooley stated that the one image/one record scenario for description was considered impossible for the description of the visual materials from outset of the DIAP project. (Personally, I find this an interesting assumption that needs to be explored further, and one that clearly had major framing consequences for the project). The project team assumed internal relations within collections was important and, therefore in another significant conceptual leap with consequences for the rest of the project, adopted an hierarchical model in which images had a "desired presentation order." DIAP "collections" have record in RLIN (about 70 for the whole DIAP project) so access below that level needed to be provided by a new system. Stokes developed this system, but it was not delivered until the

final days of the project. The participants see now that other approaches could have been used, such as access through marking up finding aids in the manner of the U.C. Berkeley finding aids project, or marking up in HTML and providing access over the WWW, but these were not envisioned or possible at the time. Instead they focused on methodologies for group-level description and access in which presentation needs to show collection-level data in item displays.

In the discussion, participant Steve Hensen (Duke University) argued that access standards were not faced by the team: they just did what they had been doing. As a result they did not establish dynamic links between the item database and the RLIN records. This led to discussion of architectures to link growing sources of information and to ensure attribution so that conflicting data can be reconciled and debated. They also recognized the need for bookmarks and searchable annotations in large image bases to cut down browsing overhead in future searches. Participant Stephen Davis (Columbia) noted that the project learned that searching across at a single hierarchical level, when these "levels" had relative rather than absolute significance, failed, proving an assestion I made to NISTF in 1981 which became the basis for discarding physical "levels."

In his presentation, which followed, Stephen Davis asked how to make images widely available in a distributed environment. Noting that decisions made about images need to fit into models for other forms of material, he suggested that the differences between archives and item-level approaches are narrowing while the concept of publication was becoming more complicated. Among other complications is the fact that when the MARC interchange standard (Z39.2) was created, libraries were ahead in standards. Libraries are no longer in the lead and solutions will, increasingly, come from large commercial players. He then suggested that SGML, and definitions of necessary metadata for object description, would replace the MARC approach. His discussion did not adequately stress for the audience that SGML is just a meta-language for content declaration and does not solve the question of content standards (which will be reflected in the Document Type Definition or DTD). Davis did not identify rules for what metadata elements are necessary. He did, however, suggest some ways of thinking about the vexing problems relating to multiple versions of objects, including

requiring one record per item (in effect the way that metadata encapsulation would), building a multiple version record with all data in one record, and using "SGML" (although it was not clear what structures he envisioned in the DTD to solve the problem).

Nancy Elkington (RLG) summed up the first day by noting that access played a critical role in all talks: both intellectual and physical. The issues are not just the linkages between networks and local systems, but fundamental questions such as to whom is the information important and what level of description is appropriate. There was not much attention to given legal rights, which surprised her, as she had expected more. Preservation also came up infrequently, but DIAP wasn't about this. What she derived on the whole is that there needs to be a synergy about image capture and quality, we need to understand better who our users (including new ones) are. The new tools needed to move forward, she suggested, are not software but benchmarks, baselines, and decision trees.

On the second day, Patti McClung introduced Jack von Euw and Daniel Pitti to discuss the University of California at Berkeley findings aids project. UCB was a participant in DIAP, and von Euw explained that it chose to exploit a hierarchical model, with the aim of creating a platform-independent method for access to archival finding aids. They hypothesized that the need to find a way into huge volumes of photographic archives without new item-level cataloging would require a variety of methods of description to work together. The attraction of archival methods is that the hierarchical approach to description can often provide essentially all that is required for item-level access without arriving at the item-level at all.

The Berkeley project developed three scenarios:

- (1) A MARC collection record with item analytics or MARC sub-unit record with item analytics;
- (2) Separate item records for each item;
- (3) Collection record with pointers to a finding aid in SGML.

They decided to explore the third option by entering each collection as a group of series and sub-series. (In my view, this essentially defeated the major benefit of SGML which is to mark existing data). They used inheritance from larger units to their subordinates to reduce data redundancy, but in a peculiar twist, they located individual images in multiple places in their "finding aid" because, it seems, their finding aid was actually an indexing structure.

Daniel Pitti, who gave the second part of this presentation explained that the Title IIA grant they received had the objective of developing a standard for archive and library finding aids based on SGML and developing a database in the standard. Its ultimate purpose was to facilitate exchange in a software independent way and enable users to see consistent structures. Assuming that paper finding tools will ultimately be transferred to machine-readable form, the question was how to create new functionality. The project began by gathering finding aids from as many sources as possible, although Pitti admitted it had problems getting these. It then developed a model based on analysis of the aids it had and a prototype standard. Finally it conducted a superficial user evaluation. [See their ftp site: [library.berkeley.edu/pub/sgml](http://library.berkeley.edu/pub/sgml)]

Pitti conducted a demonstration of the Electronic Book Technologies (EBT) software with the test DTD. The audience was impressed, I assume because they hadn't seen SGML browsers previously. I was left worried that the presentation by Van Euw and Pitti tended to conflate the important decisions about data content and structure (markup) with the markup language (SGML in this case) and the software functionality (EBT in this case), leaving the audience unable to distinguish or critique the outcome.

I think the objectives of the project were exactly right, but am afraid that because they received finding aids from few institutions, and got what those institutions considered their best aids rather than representative ones, the project then made the mistake of thinking they should develop a prescriptive standard rather than a descriptive one. This fundamentally defeats the greatest benefits of SGML which are to provide a broad enough set of markups to enable the range of descriptive literature created about collections in the past to be used in a semi-structured way.

In the discussion I noted that in order to make images of archival holdings accessible in electronic form there has to be an item-level record (the image). This record can be associated with textual description that either has a great deal of redundancy (at item level) or little redundancy but requires considerable processing and display functionality to support the requirement for hierarchical inheritance. The actual choice of these strategies is a trade-off in systems architecture at the delivery end and that either could be fully interchanged as if it was the other. However, I don't think my point was understood since the discussion veered to the question of how much prescription was necessary for data conformity. Steven Davis asserted that DIAP had been trying to avoid prescription. Stephen Hensen argued that we may need more data structured in similar ways in the extended texts associated with finding tools and that modeling documents "outside" the database is better than extending the cataloging code. Ricky Erway felt it was irrelevant which way we go with past data but that hierarchical data entry methods displayed by Pitti were good and easy and that SGML markup will be a good way to create a new finding aid.

In response to my critique, Jack van Eeuw defended their analysis as having been descriptive and not based on too narrow a source set and assured us that it is intended to enable the markup of existing things. Daniel Pitti agreed that the issue is we should be paying attention to is the specific content markup and what attributes they've chosen rather than to SGML itself or the software. He asserted that the criteria they selected for markup were based on functionality that could be obtained by separate identification of elements, but did not provide examples, in part because time prevented and because a multi-day workshop on their project followed the DIAP meeting and many of the participants would be staying on.

In her summation, Anne Kenney noted how fast a project of this sort can be overtaken by processes outside its control, and how necessary it is to plan for rapid change. She emphasized that we can learn from less-than-successful projects too. For example, DIAP attempted too much and didn't define its goals precisely enough: this is learning. We need to describe iterative steps in an overall model or scenario and be aware of their dependencies. Cooperation not necessarily a "natural act",

but this project does demonstrate its value. Important points of agreement she heard over the course of the meeting included the need to:

- develop links between finding aids and cataloging records;
- engage users throughout;
- acquire and build in-house expertise;
- elaborate project guidelines, selection methods and decision trees;
- make certain you have the necessary technological infrastructure.

Proceedings of the meeting are expected to be published by the Research Libraries Group. □

## **"Data Management in the Eye of the Storm" Vancouver, BC, CANADA, May 1-3, 1995**

by Jayne Bellyk

Records managers and archivists are not the only information professionals with an identity crisis. Another such group who are rethinking their future, mission, objectives, and contributions to their sponsoring enterprises in light of the maturing of the Information Age is the data administration and management profession. The 7th Annual DAMA International Symposium, "Data Management in the Eye of the Storm" was held in Vancouver, BC, on May 1-3, 1995. I was struck by the fact that this is only the seventh such event and already the demise of the profession is somewhat stale as a conference topic (judging by the tone of several presentations). It appears that the continuous acceleration of information technology is already challenging and endangering this profession, whose very existence was spawned by an earlier IT paradigm. For the data professions, the problem arises from the marginality of improvements in information systems productivity and their inability as a profession to keep pace with the demands of business, which forces them to routinely rethink everything about systems development and data and database administration in order to stay in the game.

The conference program was created around the theme of change and the challenge that data administrators face in order to harness and use the momentum and strength of the change to their professional advantage. The featured speakers were representative of experts in specific areas of change, or in process of change itself. Those considered experts are not data administrators per se, but figures in the computer industry who understand and can predict how the advent of new techniques and concepts and technology might effect data administration as a profession. Presentations about areas of change included data warehouse, object oriented technology, client server technology, and rapid application prototyping. Presentations about the process of change included business process reengineering/improvement, development methodologies, information management, and the psychology of change. I will limit comments on the sessions to only those sessions that have some relevance to our own and are of a non-technical nature.

The first featured speaker was Dr. James Harrington who presently serves as the International Quality Advisor for Ernst and Young International. Dr. Harrington is also Chairman of the International Academy for Quality. He was a senior engineer and project manager in quality assurance at IBM for 40 years and spoke to the conference about business process improvement (How and When to Use Process Reengineering, Redesign, and Benchmarking). Business process improvement is the shift of organizational focus to customer-perceived value, that is, it focuses on individual processes to make them more effective, efficient (in use of resources) and adaptable (in meeting specific needs). Upper management provides vision and direction, teams correct the problems, and individuals provide the creativity, but it is the processes within any organization that get things done, Harrington explained. No matter how you manage, or who your employees are, your organization cannot be successful if it is using the same business processes it used in the 1980s. In his presentation, Harrington outlined the phases and activities of a business process improvement methodology. The goal of business process improvement in a nutshell is to eliminate those processes which do not add value, minimize those which add value only to the business, and maximize those processes which add real value to the organization and that bring together the people, the processes and technologies needed to do so. In other words, all improvement efforts and supporting systems must be directed at the process and not the individual. Business process

improvement is best accomplished when one person is held accountable for the performance of the total process and is given authority to bring together members from all the individual functions involved within the process, with the objective of maximizing its total performance.

Business process improvement or reengineering is here and happening where we work, whether it is called this or not. I think the message for the archival profession is aimed at our records and archival programs and the degree to which they are oriented to the strategic plans of our parent organizations. The BPI movement is one explanation of how outsourcing is rationalized by senior management. Perhaps it would be beneficial to reexamine what we do in light of the goals of our sponsoring agencies and organize our contributions around specific business processes and the persons that create archival records.

Another speaker featured at this event was John Zachman, the author of the "Framework for Information Systems Architecture" which has received broad acceptance around the world as an integrative framework or "periodic table" of information system architectures. His presentation, "Increasing the Wealth Producing Capacity of the Enterprise," started with an overview of his framework which represents the transfer of knowledge about one complex engineering field (aircraft engineering) to another (software development). The framework recognizes the interplay of different perspectives of various participants and the different ways that they depict their needs and products in the development of a complex product. The framework is a conceptual or logical structure for understanding a complex enterprise and for classifying the records of the planning, analysis, design, and construction activities of information system development. It was interesting that what Zachman meant to convey referred in part to the creation and preservation of the representations of the information systems development process. He said that if the enterprise retains all the representations used to design and build the system then it will be better prepared to manage change because it will not have to start completely over again in gathering data about the process and activities. If all versions of an information system are maintained by the enterprise it will have more knowledge available to it, especially when it undergoes major infrastructure change. Zachman said that the only way that the enterprise will be able to assimilate high

levels of change is to maintain all models of the enterprise at excruciating levels of detail.

The remainder of Mr. Zachman's presentation pertained to the role of decentralization of the modern enterprise and removal of bureaucracy in the empowerment of those at the bottom by giving them access to the knowledge base. Zachman used empowerment in the sense that everyone in the enterprise acts independently but responsibly (and is accountable) to increase the wealth producing (or service providing) capacity of the enterprise. The enterprise challenge is not technology, he said, it is enterprise architecture and cultural change.

In my opinion, the success of the framework was in large part due to its usefulness as a communication device and lexicon among participants in a development project. And in this way, would also service our profession in providing a common glossary with which to discuss and understand electronic records issues. What Mr. Zachman emphasized in the presentation was the value of the knowledge within the records of the development process and the importance of managing this source of business knowledge. Accountability was used by this speaker as a quality mechanism to ensure the creation, integrity, and reusability of enterprise knowledge.

Ron Ross, editor of the Database Newsletter, when talking about the future said, "John Zachman will be still be talking about architecture and will still be right." He said that in the future business rules will be used to express requirements and data will be used as a stepping stone to rules, terms, and facts. Rules will become the foundation of new development products, Ross said. Object-oriented technology, he believes, will fade in importance because it models activities and not knowledge and because of this can not solve the whole suite of current problems that business is addressing. Ross predicts that data warehouse issues will implode, that is, will cause problems because the data being consolidated does not follow consistent rules. Companies will finally realize that legacy systems are the real problem, he said, and they will be eyed for full scale replacement with rule-based products. What does this tell us about preserving the databases of the 60s, 70s, 80s, and 90s? Lots. If these folks can't understand and reuse them, neither can we.

Clive Finklestein who is one of the originators of Information Engineering spoke about Prototyping Client Server Systems from Data Models. The development of a data model is essential for the successful implementation of client/server systems, he said. Before detailed design of the application logic in those client/server system commences, much valuable prototyping can be carried out directly from data models using the many development tools available today, he said. This session demonstrated rapid prototyping directly from data models, and showed how they can be reused to create project plans, screen designs, etc.

Larry English is a speaker, educator, author, and consultant in information resource management and data administration. He spoke about "Transforming the Role of Information Management for the 21st Century." The successful enterprise of the early 21st century will be distinctly different from the shape of the successful enterprise of the 1980s, he said. The information age is a paradigm shift to a new way of thinking about business and the application of technology to it. Trends are clearly emerging. The 21st century will be faster, leaner, customer-focused, process-oriented, team managed, and information enabled, English said. Information systems must transform to facilitate the new enterprise. Mr. English described how the technology of the information age is giving way to the principles of the information age. Successful organizations are transforming data administration into data management, information systems into information management, and industrial age management practices into information age management practices. Information management implies planning, organizing, directing, and controlling information as an enterprise resource and includes more than just data; it includes the data, business process, and technology. Information management also means that business processes are to be managed across their value chains, data is managed to be shared by many applications and knowledge workers, and business managers have accountability for data as for other corporate resources (financial and human). English views accountability for data as key to successful information management.

In his presentation, Mr. English described the factors present during this transformation and the requirements for success, and the essential objectives that the data management function must accomplish to become an information age management function. Mr. English described

the reasons why data administration programs have not fully achieved their goals and outlined the steps to transform the data administration function into an effective and strategic business function. This advice included moving from a support role to a leadership role, developing key relationships with important allies or customers, recognizing team rather than individual performance, minimizing technology to exploit business process faster and more flexibly, and optimizing reusability and prohibiting duplication.

One of the last speakers was Jennifer James, the cultural anthropologist who is often seen on public television and who previously taught in the Psychiatry Department at the University of Washington. Dr. James spoke about Change And Risk. She noted that today there is no way to invest in a career and expect it to take a linear path. We need a new mind, she said. Today there are more computer literate grade one kids than grade one teachers, she said. To generate a 21st century mind we need to first understand the cultural evolution we are in, then notice new patterns, check new myths, expand our energy, crack models and tolerate chaos. The more we understand about where we've been, the less we have to fear about the future, because in recognizing the patterns and cycles, we can understand and not be frightened by periods of rapid change. In her presentation, Dr. James applied the process of change to corporate culture and outlined the personal skills required to deal with change.

There are parallel lessons for the archivists in what is happening to this and possibly other information professions. This data administration group realizes that many of their responsibilities and products have shifted to programmers and other knowledge workers, and that they are overly specialized (a functional silo within a functional silo). Users are more sophisticated than ever before and the tools they are using are generating new problems and new data types that need to be managed and secured. But users want new compound documents that integrate video, voice, image, and graphical information with text into one user view. If they have no one to advise and assist them they will create it for themselves, and hence another possibly mission critical or operationally significant application ends up on a desk top somewhere. If information is an asset, then data administrators admit that they deal only with about 10 percent of it. How much can we say we control and will control in

the future? They recognize the need for additional skills sets in order to survive professionally in the wake of object-oriented technology, data warehouse, and business process reengineering. One practitioner who gave a presentation said that the future belongs to those with depth in a lot of different fields and skill. He warned the data audience that you'll get more done if you don't mention the words "data" or "corporate." (Sound familiar? It does if you replace the words "data" and "corporate" with "archive" and "record"). But someone asked if after the new skills were acquired, were you still a data administrator, or something else?

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### **Debriefing on G7 Electronic Museums and Galleries Pilot Project, April 14, 1995, Washington, D.C.**

David Lytel opened the meeting by reviewing the status of the Group of Seven (G7, the most industrialized countries: U.S., Japan, U.K., France, Germany, Italy, Canada, European Commission) initiative relating to the development of the Global Information Infrastructure (GII). President Clinton raised the issue of the GII at the last summit in Naples. A Ministerial Conference devoted solely to the interests of the GII was held at the end of February in Brussels. The U. S. delegation was led by Ron Brown; Vice President Gore also attended. The G7 nations agreed to cooperate in eleven projects. Tom Kalil has overall responsibility for U.S. involvement and provided a status report; David Lytel is responsible for U.S. participation in the two projects relating to libraries and museums. The Italians have overall coordinating responsibility for the museum project, and Susan Siegfried (Getty AHIP) attended the recent meeting of the G7 Working Group on Museums on behalf of the U.S. Other projects include such areas as health care, electronic libraries, and the global marketplace for small and medium-size enterprises.

#### **Goals for the GII initiative are:**

- To foster practical applications to make the concept of the GII more concrete. There is confusion about the meaning of the

National Information Infrastructure (NII), and the GII is even more amorphous.

- To address privacy, security, interoperability, and legal, regulatory, and cultural issues relating to the development of the GII.
- To address issues on the international agenda in which information technologies and communication can play a significant role, e.g., pollution, biodiversity, etc.

The GII initiative will build existing resources and will reflect a "learning by doing" approach. Participation is not limited to G7 countries. The easiest projects involve national resource creation and global resource sharing. Lytel stated that we want to expand the amount of networked resources, and each country can contribute. We want enough cooperation to work out any issues relating to standards. There is a wide range of technological sophistication among the G7 countries, including some that have no current use of the Internet or WWW. The initiative is designed to get a couple of projects going and have those foster spontaneous collaboration, especially as it becomes easier to identify counterparts, and stimulate other projects. Carl Malamud has a project to create an Internet World's Fair, with Thailand, the Netherlands, Japan, and others offering multimedia "pavilions." Quantum is donating disk space. The project would use satellite transmission to reach developing countries. The thrust of the G7 summit in Halifax this summer will be on economic issues, but those attending will probably recognize and endorse the GII efforts as an outcome of the Information Society Conference in Brussels.

#### Discussion following Kalil's summary:

*Is there a commitment to Internet protocols? In the past, this group has been "stuck in ISO land."*

There is not a high level of awareness of WWW and Internet protocols. There are efforts to build a global inventory. The Europeans are responsible, and are using WWW, which we remind them when possible is a technology built at CERN.

*What about issues relating to global broadband networks?*

There is some commitment to promoting ATM.

*What about free speech issues? Is there consensus among G7 members?*

There was not much discussion of these issues. Vice President Gore discussed them in the context of the value of technology in promoting democracy, allowing everyone to be a publisher. There was also recognition of the role the Internet played in the earthquake in Japan. College students were providing invaluable information. Technology enables grassroots activity.

*Is there consensus on policy issues, legal parameters such as whether the carrier is responsible for content?*

There is consensus on policy issues like universal access and interoperability, but variation in how fast different countries are moving in these areas. The biggest differences among nations result from differences in the cost of connection. For example, some still have monopolies and high costs for telecommunications; moving away from government control will make a big difference. The U.S. and U.K. have gone the farthest in fostering competition in these areas. [There is no interest in pushing this G7 group into serving an ongoing function in the GII arena.] The G7 will increase visibility for these issues, and farm them out to appropriate bodies, e.g., the World Trade Organization re: liberalizing telecommunications, the Organization of Economic Cooperation and Development for security and privacy issues, for copyright and intellectual property issues, etc.

Susan Siegfried reported on the April 6 meeting of the pilot project on Electronic Museums and Galleries. [As an introduction, she offered the following remarks: "I believe it would be useful to think of the G7 pilot project on museums and galleries primarily as a consensus-building project. It is important to remember the international context of these meetings and the report they produced, Multimedia Access to World Cultural Heritage. While some countries like the United States and Canada are technologically advanced, others are not. Some people think hierarchically, others think laterally. The attendees at the project meetings represent a diverse mixture of civil servants, diplomats, museum

staff (with interests ranging from fish collections to science and technology to the visual arts) and technology experts."

"Language barriers exist -- for example, some participants speak Italian and French but not English. It is difficult to translate ideas into other languages, particularly concepts such as 'search agents,' 'filters,' and 'bandwidth.' The ideas must be fairly simple or introduced gradually with time for thought and discussion. Trying to understand what people are proposing, discussing the merits of various proposals, and coming to agreement within a single day is a recipe for a difficult meeting. Much of the report under review, 'Multimedia Access to World Cultural Heritage,' is built upon intuition, trust, and the desire to learn and participate. The G7 pilot project on electronic museums and galleries may not be leading edge for the United States, but it is for other countries. On the other hand, given the structure of the European Union and its funding programs such as the Fourth Framework and ACTS (Advanced Communications Technologies and Services), Europeans are used to working collectively and have more patience for the consensus process. Everyone has something to gain and learn from this project. Reaching international consensus on standards of use to the cultural heritage community alone is a goal of enormous value." [Regular reports are available through the Information Society Project Office (ISPO) webserver at the European Commission <http://www.ispo.cec.be>]

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## IN-BOX

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### Reference

- \* Commission on Preservation & Access, **Digital Resolution Requirements for Replacing Text-Based Material: Methods for Benchmarking Image Quality** (April 1995) 22p.

This 'tutorial', authored by Anne Kenney and Stephen Chapman of the Cornell University Department of Preservation and Conservation, is a fundamental reference work on document imaging, with details on determining pixel dimensions, measuring digital image quality, benchmarking resolution requirements, and verifying quality. [CPA, 1400 16th St. NW, Suite 740, Washington DC 20036-2217; fax 1-202-939-3407]

- \* **Harvard University Information Infrastructure Sourcebook**, version 5.0, edited by Brian Kahin (Cambridge, Harvard University School of Government, May 1995), 1750pp.

This edition of the Sourcebook, like previous editions, reprints what was originally about 3,400 pages of background policy documents, position papers, vision statements, project descriptions, and reports that will be of

use to policymakers and planners involved in any aspect of the NII. [The hardcopy is \$90 (update for those with version 4, is \$40) from: Document Imaging Services, Office of Information Technology, 1730 Cambridge St., Rm. 202 Cambridge, MA 02138; [ariney@husc10.harvard.edu](mailto:ariney@husc10.harvard.edu)]

- \* **Image Technology in Museums**, vol.9 (International Visual Arts Information Network, The Library, Suffolk College, Rope Walk, Ipswich, Suffolk IP4 1LT, UK; fax +44-1473-230-054; [ivainjr@gn.apc.org](mailto:ivainjr@gn.apc.org))

This volume focuses on 105 published titles from 14 countries, and complements volume 8, which focused on the unpublished projects. The latest volume also contains updated and new reports on an additional 38 projects bringing the two volumes total to 289 current projects from 22 countries. IVAIN is conducting a pilot test to convert ITEM to the WWW.

### Reports

- \* Australian Archives, **Managing Electronic Records: A Shared Responsibility**, Commonwealth of Australia 1995, 8p.

This statement by the Australian Archives formally articulates as national policy a framework for distributed responsibility in the management of electronic evidence which I have been advocating for a number of years. Needless to say, I'm delighted to find it expressed in such a straightforward way and look forward to seeing how it works over the coming years.

- \* Archives Authority of New South Wales, **Records and Recordkeeping: Introducing New Concepts** (November 1994) 8p.

David Roberts, the author of this guide, has synthesized the best work in electronic records management and laid it into a reconceptualization of the nature and purposes of archives.

- \* Annenberg Washington Program, **Computer Manipulation and Creation of Images and Sounds: Assessing the Impact**. Dan Tomlinson, Conference Convener. (Washington, DC, Northwestern University, Annenberg Washington Program, 1993) 57pp.

In April 1995, I attended a show of digitally altered photographs by Pedro Meyer, an excit-

ing Mexican artist, at the Corcoran Gallery of Art in Washington. Meyer, in the show and an accompanying CD-ROM from Voyager, explained how and why he used digital techniques to compose photographs rather than the traditional (and to him more stilted) techniques of scene setting. I was reminded of this report, which raised numerous issues and especially raised the spectre of legal problems with first amendment rights, copyright, privacy, and evidence, but failed to suggest the underlying creative potential of digital alteration of images and sounds. The cultural tension is fascinating: in the Pedro Meyer exhibit, the one photograph that has not been digitally altered is a statue of a fourteen foot high chair, which seems on the surface to be the most likely candidate to have been created digitally in the show!

- \* European Association of Manufacturers of Business Machines and Information Technology Industry (EUROBIT), Information Technology Industry Council (ITI), and Japan Electronic Industry Development Association (JEIDA), **Global Information Infrastructure (GII): Industry Recommendations to the G-7**

**Meeting in Brussels**, February 25-26, 1995.

This position paper on interoperability, privacy and trust, intellectual property, universal access, access to R&D, and market access reflects the coordinated position of the information industry worldwide on the policy framework for the GII. Since it is clear that this is THE position that will either prevail or need to be opposed, anyone concerned with cultural heritage and the GII must read this pamphlet. [Fax to EUROBIT at (69) 6603-1510; ITI at (1) 202-638-4922; JEIDA at (3) 3433-6350]

- \* European Commission, **Archives in the European Union: Report of the Group of Experts on the Coordination of Archives**, (Luxembourg European Commission, 1994) 102p. (ISBN 92-826-8233-1; price 10 ECU)

This report, which follows up on a EC resolution of November 1991, discusses both electronic records ("the management and storage of computerized archives") and networking and information interchange. On both scores its principal recommendations are that follow-on activity is required to achieve consensus and share

implementations, but the texture of the report makes interesting reading and many government studies by member countries, which are not widely available in the U.S., are cited.

- \* ICAP: Intergovernmental Cooperative Appraisal Program, **Food Stamp Records Project Report** (Albany, NAGARA, March 1995), 63pp.

This report on a project undertaken by the National Archives, the National Association of Government Archivists and Records Administrators (NAGARA), and six state archives (Alabama, Massachusetts, New York, South Carolina, Utah and Virginia) in 1993, represents the first serious effort to exploit commonalities in decision making about records across political jurisdictions in order to achieve greater efficiencies. It was undertaken in part in response to Vice President Gore's National Performance Review, which called for such collaborations and reflected the fact that "more than 50% of the records of state governments today are created and maintained solely because of the federal recordkeeping requirements" (although it might be more accurate to say that the programs they document are federally funded or mandated). The

report identifies three major problems: excessive paperwork retention, confusion over recordkeeping responsibility, and lack of guidelines for electronic recordkeeping. Details of the findings are sufficiently generic in character to make this a valuable study for other cooperative appraisal undertakings, but the participants do not adopt any radical new strategies or introduce any systemic changes.

- \* National Association of Government Archives and Records Administrators, **Archival Programs for Local Governments** by Kaye Lanning Minchew (Albany, NAGARA, May 1995) 18p.

The seventh in a series of Local Government Records Technical Publications contains the sort of practical advice one would expect in a hands-on manual. While nicely printed, it seems text heavy to me.

- \* Helen McCorry and Ian Morrison, **Report on the Catechism Project** (Edinburgh, National Museums of Scotland, 1995), 9p.

This slim report characterizes over 1,000 actual questions received by various museums in

Scotland and England from members of the public and museum staff in 1993. Categories were created on an ad hoc basis and the actual questions themselves (or the form in which they were conveyed to the study) are not shown, so it is very difficult to draw any conclusions other than those presented by the report. What the report concludes is that object type answered almost 20% of the questions, with an additional 14% of the questions about associated subjects, individuals or events. Procedural questions, typically museum staff asking how certain things can be done, amounted to 13%, but may be under-represented because not all responding museums included such questions. On the whole, the report is suggestive, but more detail about the actual questions and different types of analysis will need to be available for the study to have a direct impact on systems design.

- \* New York State Archives and Records Administration, **Building Partnerships for Electronic Recordkeeping. Final Report and Working Papers.** January 1995

The full final report of this critical project is valuable both for the new synthetic overview by Margaret Hedstrom and the col-

lection of working papers. Among the important details in the working papers are those in five case studies by Tom Ruller and Alan Kowlowitz which empirically confirmed hypotheses I and others have advanced in recent years. Specifically they found that data administration by itself didn't serve archival needs but that when it was practiced in an organization with a mission that was sensitive to recordkeeping issues it served as a vehicle for archiving. They found that inventorying systems when conducted by agencies with their own programmatic purposes for doing so (even when such inventories were submitted to the State Archives to satisfy its requirements), did not contribute to recordkeeping, but that when agencies wanted to purge records, they could cooperate with the archives to develop and implement criteria. And they found that business-process-based systems development methods were more suitable for imposing recordkeeping requirements than data-oriented processes.

## Newsletters/Journals

- \* **Art & Architecture Thesaurus Bulletin** (ISSN 1067-599x) Number 22, 1994 (62

Stratton Rd. Williamstown, MA 01267)

I know it's only an annual "in-house" newsletter, but anyone interested in information retrieval will want to look at this issue which contains more serious articles on the issues of multi-lingual thesauri and the linking of different vocabulary standards than have appeared in scholarly journals for years.

- \* **FID News Bulletin** (ISSN 0014-5874) Volume 45 #4, April 1995

This special issue on multimedia, edited by Terence Huwe (U.C. Berkeley) is one of the more challenging collections of points of view on multimedia authoring, learning, publishing, and distribution I've read. The issues it addresses are familiar, but the authors have brought great insight and considerable experience to the task; the only disappointment for an international journal is the concentration of authors in California.

- \* **Initiatives for Access News** (ISSN 1353-2480)

This bi-annual newsletter of the British Library Initiatives for

Access program reports on the many interesting multimedia access ventures of the British Library. The most recent edition, December 1994, included articles on the British Library gopher site (gopher://portico.bl.uk), the experiments in text recognition and automatic indexing, CD-ROM publications, and the multi-media OPAC.

- \* **Interactivity** (ISSN 1077-8047) bi-monthly from 411 Borel Ave., San Mateo CA 94402-3516

Volume 1(1) and 1(2) are 100+-page, glossy journals with reasonably good, practical articles. The orientation is "how-to" and the topics are a mix of CD and networked delivery.

- \* **Screen Digest** (No ISSN)

This monthly industry newsletter reports on film, television, video, cable, satellite, multimedia and other media news in paragraph long summaries, analytical tables, and market/sales figures. The international scope and range of its focus makes it interesting to peruse, although expensive to receive regularly (\$460). [37 Gower St., London WC1E 6HH; fax +44-171-580-2842]

## Articles and Books

- \* Terry Cook, "Electronic Records, Paper Minds: The Revolution in information management and archives in the post-custodial and post-modernist era," **Archives and Manuscripts**, vol.22(2), November 1994, pp.300-329.

Terry Cook's examination of the post-custodial influences in archives is thorough and illuminating, making links across continents and across time that are intellectually interesting if historically dubious. His attempt however to marry post-modernism to his case feels like the tacked on end piece. It is neither convincingly woven in nor artfully arranged to enhance the other.

- \* Chris Hurley, "Data Systems, Management and Standardisation," **Archives and Manuscripts**, vol.22(2) November 1994, pp.338-359.

Chris Hurley's evolving views on standardization reflect and lead those of his Australian colleagues. Here he reassesses the shift that has taken place in the codification of Australian practices since 1990 and explains the practical reasons for the steps that have been taken to date. Unfortunately, Hurley has

not yet completely come to grips with the questions of "why" archival description and hence his answers to "how," like those of his colleagues worldwide, remain unconvincing.

- \* Stephanie Kenna and Seamus Ross, eds., **Networking in the Humanities: Proceedings of the Second Conference on Scholarship and Technology in the Humanities held at Elvetham Hall 13-16 April, 1994** (London, Bowker/Saur, 1995) 366pp.

No other single volume combines more important articles on the future of networked cultural heritage than these proceedings of the 1994 Conference on Scholarship and Technology in the Humanities. I would characterize papers by Margaret Hedstrom ("Electronic Archives: Integrity and Access in the Networked Environment"), Brian Kahin ("Institutional and Policy Issues in the Development of the Digital Library") and J.C.Nyfri ("Electronic Networking and the Unity of Knowledge") as being both groundbreaking and pointing towards important areas for future exploration. Michael Ester ("Issues in the Use of Electronic Images for Scholarship in the Arts and Humanities") and Avra

Michelson ("Networking and the Scholarly Community") summarize studies of great importance to scholarly computing that have been reported elsewhere. Charles Henry ("The Network and the Organization: The Acculturation of Space") and Marilyn Deegan ("Networking and the Discipline") raise interesting theoretical issues supported by unsystematic observations. It is worth noting that in her concluding remarks, "Networks and Networking," Deian Hopkin, Dean of the Faculty of Human Sciences, London Guildhall University, uses the concept "cultural heritage" to embrace the breath of arts and humanities issues raised by the speakers and explains why.

- \* Kirsten Mortensen, "Technology Meets Culture at the Dawn of the Digital Museum," **CD-ROM Professional**, May 1995, pp.106-111.

It is always interesting to see how outsiders present the developments in digital museums. In this piece, both collections management and public outreach are illustrated through examples drawn from the Smithsonian, George Eastman House, Canadian Museum of Civilization, Dallas Museum of Fine Arts, and the Valentine Museum. The attraction of

commercial success and the public relations potential of the Internet also attract attention.

- \* Kristof Ostir, "Image Processing Software for Archaeologists," **Archaeological Computing Newsletter**, #42, pp.11-18.

I don't know if its more amazing that half a dozen inexpensive packages for analyzing remote sensing data exist or that they have been compared by a researcher in Slovenia. As is typical of articles in this journal, the comparative assessment is well worth reading.

- \* Stephen Yorke, ed., **Playing for Keeps: An Electronic Records Management Conference** (Canberra, Australian Archives, 1995)

The proceedings of this conference, which was itself reported on in the last issue of this journal, include the papers submitted, the papers delivered, and the transcripts of discussions and question periods. They are produced in a softbound volume with straightforward typography and are arranged in the sequence of the conference, of which they will serve as an admirable record. [Available from Public Programs, Australian Archives, P.O.Box 34,

Dickson ACT 2602 Australia or by fax +616 209-3931 at AU\$24.95 per copy plus shipping abroad. Bankcard orders are accepted with card number, expiration date and signature].



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## NEWS

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### National Digital Library Federation

Leaders of fifteen of the nation's largest research libraries and archives and the Commission on Preservation and Access signed an agreement May 1, 1995 that pledges collaboration toward the establishment of a National Digital Library Federation. At the signing held at Harvard University, the founding members of the Federation -- collectively responsible for hundreds of millions of cultural, scholarly, and historical resources -- agreed to cooperate on defining what must be done to bring together -- from across the nation and beyond -- digitized materials that will be made accessible to students, scholars, and citizens everywhere, and that document the building and dynamics of United States heritage and cultures.

A primary goal of the Federation is the implementation of a distributed, open digital library accessible across the global Internet. The library will consist of collections -- expanding over time in number and scope -- to be created from the conversion to digital form of documents contained in founding member and other libraries and archives, and from the



incorporation of holdings already in electronic form. In support of that goal, the Federation will establish a collaborative management structure, develop a coordinated funding strategy, and formulate selection guidelines to ensure conformance to the general theme of U.S. heritage and culture. The Federation also will adopt common standards and best practices to ensure full informational capture and guarantee universal accessibility.

The agreement recognizes and acknowledges the important leadership role that the Library of Congress has played in raising as a national issue the need for such a digital library. The first phase of the Federation's work will be completed in six months. During that time, a task force coordinated by the Commission on Preservation and Access and composed of senior members of the staffs of the founding institutions will develop an action plan to address, among other issues, funding strategies and the involvement of additional institutions. The Commission will report regularly on developments.

## National Archives of Canada Access Site Opens at The University of British Columbia

The National Archives of Canada, in conjunction with the University of British Columbia Library, opened its Vancouver Access Site on April 19, 1995. The Vancouver Access Site (others were opened in Winnipeg in 1992 and Halifax in 1994) is a stand-alone installation allowing researchers to use combinations of different types of technology to conduct research at a distance. At one computer workstation, researchers can consult a number of CD-ROM databases containing National Archives finding aids. From this workstation, researchers also have the option of faxing their reference requests for holdings directly to the National Archives in Ottawa.

At another workstation, an interactive teaching tool on CD-ROM, called "Using Archives", shows researchers what they can expect from a visit to an archival repository, and gives them an overview of conducting historical or genealogical research using archival documents. Here, researchers can also access an audio "Bulletin Board" of current and upcoming exhibitions and special

events of the National Archives across the country. Also, portions of National Archives collections on microfilm can be consulted in the Government Publications and Microforms Division of the UBC Library. [For more information, phone (604) 822-5877 or (604) 822-2521, or fax (604) 822-9587, or e-mail Chris Hives (chives@unixg.ubc.ca), or Erwin Wodarczak (ewodar@unixg.ubc.ca) UBC Library -Special Collections and University Archives.] □

## National Electronic Open Meeting on "People and Their Governments in the Information Age" May 1-14, 1995

Declaring that "the Information Age offers the opportunity to make government more responsive to the needs of the American people," the Clinton Administration asked networked Americans about the type of services and benefits they would like to receive electronically from all levels of government at a national electronic open meeting held May 1-14, 1995.

The Administration's Information Infrastructure Task Force

(IITF), the Office of Management and Budget (OMB), the National Telecommunications and Information Administration (NTIA), the National Technical Information Service's (NTIS) FedWorld, and the National Performance Review (NPR) cooperated in sponsoring "People and Their Governments in the Information Age," from Monday, May 1, to Sunday, May 14, 1995. The national electronic open meeting is part of an ongoing effort to broaden public participation in creating an electronic government: "one that works better and costs less by improving information dissemination and service delivery."

The meeting sought "to encourage public discussion about the respective roles of the federal, state, tribal, and local governments; industry; the public interest and library communities; academia; and the general citizenry in creating an electronic government." It was conducted via the World Wide Web, newsgroups, e-mail listservs (mailing lists), commercial online providers, Public Access Sites, and toll-free modem dial-up connections so that citizens could, in principle, participate even if they did not have access to a computer. The meeting was structured as five e-mail dis-

cussion groups and corresponding Internet newsgroups, the World Wide Web, and modem dial-up lines. Each discussion group was devoted to a specific topic hosted by one or more experts, who provided an introductory statement to initiate the discussion and who also took part in the discussion. Attendees participated in the conference by replying to the hosts' introductory statements, posting statements or comments, and then by replying to the statements and comments of other attendees. Topics included:

- Services -- from emergency help to health care.
  - Benefits -- from Social Security and food stamps to business assistance.
  - Information -- from declassified secrets and economic statistics to satellite maps.
  - Participatory Democracy -- improving everyone's opportunity to participate in rulemaking and other governmental decisions.
  - Technology -- how the technical portion of electronic government will work.
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## Research Agenda in Arts and Humanities Project

The Getty Art History Information Program (AHIP) is currently conducting an assessment by leading information technology specialists and humanities scholars of research needs in humanities and arts computing. Specifically, they are examining areas of research that have the potential to improve our ability to create and use arts and humanities information. With the help of experts in many areas of information science, it has identified eight research domains considered vital to the field and commissioned papers on those domains from the following experts:

- (1) "Tools for Creating and Exploiting Content Scholarly Interfaces, Navigation Mechanisms; Visualization and Authoring Tools," Ben Schneiderman University of Maryland
- (2) "Knowledge Representation, Description of Arts and Humanities Content," Susan Hockey, Center for Electronic Texts in the Humanities, Rutgers and Princeton Universities

- (3) "Conversion of Traditional Data Formats into Digital Media, Issues in the Creation and the Capture of Surrogates," Anne Kenney, Cornell University
- (4) "Resource Search and Discovery, Identification of Data Sets of Significance, Sometimes Referred to as Cataloging Internet Resources," Gary Marchionini, University of Maryland
- (5) "Multimedia and Image Retrieval," Donna Romer, Eastman Kodak
- (6) "Learning and Teaching, Transformative Potentials of Electronic Resources," Janet Murray, Massachusetts Institute of Technology
- (7) "New Social and Economic Mechanisms to Encourage Access," John Garrett, Corporation for National Research Initiatives
- (8) "Archiving and Authenticity," David Bearman, Archives & Museum Informatics

Each author has been asked to address the present state of research in that area; the critical research questions being addressed today; who is addressing each,

with what success and in what time-frame; remaining critical issues in need of further research; and benefits to humanities that might be realized, given progress in these areas.

AHIP expects to open a mediated electronic discussion among a select group of technologists, scholars, and policymakers in June. David Bearman will synthesize the June consensus and post it with background information for an open Internet debate to be held in the fall. AHIP expects to publish a summary and analysis of the research agendas in the Winter of 1995. □

## Archivist of the United States

In short order (May 5-25), the President nominated and the Senate confirmed John Carlin, former Governor of the State of Kansas and a member of the Board of Directors of the Foundation for the National Archives, to be Archivist of the United States. Although the archival and historical professions opposed the nomination, it was clear from the outset that with the support of fellow Kansan Bob Dole, Carlin would be readily confirmed.

John Carlin is the current Vice Chairman of the Board, and former President and CEO, of Midwest Superconductivity, Inc., a high technology research and development company in Lawrence, Kansas.

Mr. Carlin served as Kansas Governor from 1979 to 1987. During his two terms, Governor Carlin held positions as National Governors' Association Chair and Chairman of Midwest Governors Conference. Prior to assuming the governorship, Mr. Carlin served as a Representative in the Kansas State House from 1971 to 1979, where he was elected Minority Leader and later Speaker of the House. □

## GILS Signed Into Law

Early in June the President of the United States signed into law the Paperwork Reduction Act of 1995, which incorporates provisions for the establishment of a Government Information Locator Service to "assist agencies and the public in locating information and to promote ...equitable access..." Each agency of the Federal Government is required to establish a GILS. The Archivist, GSA Administrator, Public Printer, and Librarian of Congress are designated

along with the Secretary of Commerce to establish an interagency committee for management and operation of the GILS, and by implication, since only they are excluded, all records of government except operational files defined by the CIA Information Act are included. □

### **Risk Map of the Cultural Heritage of Italy**

Renzo Carlucci, Technical Executive Director of the Conorzio ARCAD, recently distributed information over the Internet about a project to create a map of Italy locating cultural properties that are at risk from natural causes, in order to manage the priorities for conservation, preservation and restoration programs. The model used, involving GIS systems, expert field data collectors, and quantitative atmospheric and physical measures is worth examining. Brief discussion of "iconometric model photography," in which images are recorded in scale and "rectified" or "cleared of inevitable perspective distortions" is mentioned. For further information see their web site <http://www.uni.net/aec/welcome.html>. □

### **Heritage Preservation in the Pacific Island States**

Neal Putt, Coordinator of Preventive Conservation, ICCROM, has circulated PREMO 1994-1998, a five year plan and proposal to intervene in the conservation and documentation of cultural heritage in the Pacific States. Included in the largely low technology project is a fax network among Pacific museum professionals, e-mail, and staff exchanges, education and awareness. For further information, contact him at: [MC5356@mcLink.it](mailto:MC5356@mcLink.it). □

## **The Digital Village: An Electronic Exhibit**

**November 1 - December 22, 1995**

### **Project Overview**

The Art Gallery at the University of Maryland at College Park, in collaboration with the Computer Science Department, the College of Arts and Humanities, and the Corcoran Gallery of Art in Washington, DC, will present a major project during November and December consisting of an exhibition of electronic art by eight internationally known artists; an interactive exchange of ideas and images over electronic networks with school and community sites; electronic music and multimedia performances; lectures, workshops, demonstrations, and seminars. The theme is "Connectivity, Interface, and Imagination in the Digital Village." While the primary physical components of the exhibition and the events will be presented at The Art Gallery at Maryland and at The Corcoran Gallery of Art, the project will be geographically dispersed to many participating sites in the Washington, DC and Maryland region, to other US urban and rural locations, and to the Ivory Coast in Africa. In addition, portions of the project will be available to an unlimited number of people who choose to access The Digital Village through the Internet at homes, schools, communities, and worksites.

### **Project Concept**

The Digital Village will emphasize computer technology as the critical tool of the 1990's for the enriched communication of ideas, for creative thinking and education, and for the production of art. Through traditional art objects (sculpture, painting, photographs, etc.), screen images, physical and ephemeral "cyber" spaces, text, and sound, the exhibition will pose questions about how digital media are reshaping the world on a grand scale, restructuring societies, revamping the possibilities for intimate relationships, and changing the definitions and practices of art.

Inherent in this kind of interactive exchange is a dynamic learning process which can be integrated into many disciplines. The exhibition will serve as a catalyst and springboard for the broader educational goals of the project. Many of the artworks, as well as a unifying collaborative

school project will function as open platforms over which teachers can devise discipline-specific projects for large numbers of students who would not normally have access to either art or technology of this caliber.

### **Key Components: Artists**

Eight artists were selected by a curatorial team from The Art Gallery at Maryland and The Corcoran Gallery of Art. While the artworks vary considerably, all relate to the themes of connectivity and interface, make creative use of technology and electronic highways and, give attention to the interface/interspace among artist, media, and community. The artists' contributions to the exhibition will become links and nodes in the creation of the new world-wide "digital village."

Alan Dunning of Calgary will "build" a city on-line with many participating designers determining its shape. The evolving city will be experienced by viewers as textual description and as a three-dimensional "walkthrough," both of which will be projected in large scale on the gallery walls. The Houston team of Ed Hill & Suzanne Bloom will create an installation titled "The Constructed Forest" consisting of photographs, video, and CD ROM. It will illustrate the effect of machines and technology on forest ecology. Richard Bolton of Santa Barbara, will facilitate a visual and verbal dialogue among artists and communities in the District of Columbia, Ivory Coast, and College Park. Lynn Hershmann of San Francisco will exhibit "Lorna," the first interactive laserdisk artwork (1979) which viewers manipulate with a standard remote control device, and "America's Finest," a replica of an M-16 rifle which has been reconfigured into an interactive sculpture about violence. Richard Lowenberg's work is an Internet "community; exchange" project between his home of Telluride, Colorado, and College Park. Christine Tamblyn of Miami will exhibit "She Loves It, She Loves It Not," an interactive CD ROM which explores women's relationship with technology. Joan Truckenbrod of Dekalb, Illinois, will simulate a cozy room with furniture and a TV through which viewers will explore family structures and childcare options using multiple interactive devices.

### **Key Components: School and Community Sites**

School and community sites in Montgomery and Prince George's Counties (Maryland), Baltimore, Washington, DC, Chicago, and

Bellingham, Washington, have been identified. Teachers and administrators in each school are working with the educational outreach coordinator of The Art Gallery to shape projects which will reach several thousand students. Under the umbrella theme of "Creating a Portrait of the Digital Community," students will produce "self-portraits" using a broad definition of that term: drawings, paintings, photographs, poems, essays, and even works generated from a scientific or mathematical starting point. The portraits will be sent electronically to the Gallery and then made into an on-line composite. In addition, a hardcopy "quilt" of the community will be printed and mounted on the Gallery wall.

For schools and community groups without network capabilities, visits to The Art Gallery to participate in the project will be arranged. In addition, cable TV broadcast capabilities already in place in the school will be employed to "display" and distribute projects.

### **Key Components: Campus Educational Activities**

From the early stages of planning onward, The Digital Village has been a broadly interdisciplinary effort involving numerous faculty, staff, and students from across the University of Maryland campus. The project has been conceived to explicitly bring together two sides of the campus which often have little interaction: the sciences -- Computer Science in particular -- and the arts and humanities. In addition, linking outward beyond the campus to various communities is seen as a basic tenet of all aspects of activities which originate on campus.

Campus mentors to the public schools will guide and interact with students and teachers in the projects described above. A number of related courses and seminars are scheduled for the Fall 1995 semester including ones which incorporate exchanges between university students and public school students. Some courses address historical and theoretical issues of electronic technology and its impact on art and society, others are production-oriented and will use computers and electronic networks to create visual art, music, and writing; still others will focus on the scientific aspects of our digital world. A Collaborative Project for Corcoran and University of Maryland students is also being developed by faculty from the two institutions. A showcase for campus research projects will be incorporated into The Digital Village through

workstations within the Gallery, and through poster sessions, workshops, and lectures. A concert of electronic music by The Contemporary Music Forum and a special multi-media performance by viDEO-sAVant and SLURrr, both groups from the Washington area, will take place while the exhibition is in place.

Residencies by the artists of the exhibition are scheduled throughout the fall. These will vary in length from three and half months to a few days. During the residencies, the artists will work closely with campus students, artists from the community, and teachers from the schools in a variety of formats: courses, workshops, site visits, gallery talks, lectures, and on-line discussions.

### Objectives

While "computer art" has been around since the sixties, and technology has played various roles in art throughout history, artists working with electronic and digital technologies have only recently come to grips with the potential of these new tools/media. Many who used computer graphics early on were awed by its visual acrobatics; now, a critical mass of artists have gained access to and familiarity with digital technology and have moved beyond the limited vocabularies of "razzle-dazzle" image-making. There have been enough presentations of "computer art" so that the focus can shift at this time from the forays of machines to the forays of artists and educators. In addition, there is a shift from "technique-oriented" work to "content-oriented" work -- projects directed toward communication and education. This shift has been accelerated by the arrival of affordable, widespread, and easy to use electronic networks throughout the US and much of the world.

The Digital Village artists have been selected for their thoughtful and creative uses of technology, for their effective use of the electronic highways, and for their attention to the interface/interspace among artist, media, and community. The project offers a structured context for these artists to present their ideas and work, and to bring individuals from many disciplines together to collaborate in shaping our new society: children and adults, artists and scientists, educators, and business people, politicians and technicians. The objective is to foster a wide-ranging dialogue among all these constituencies.

### Project Descriptions

The artists in the exhibition are Richard Bolton, Alan Dunning, Lynn Hershman, Richard Lowenberg, Manual (Ed Hill, Suzanne Bloom), Christine Tamblyn, and Joan Truckenbrod.

#### Richard Bolton: *Souvenir*

An exchange between artists and the community in Ivory Coast and their counterparts in Washington. Bolton will spend the summer of 1995 in the Ivory Coast and the fall in the Washington, D.C. area. He will establish on-going dialogues within each respective community and between communities resulting in simultaneous exhibitions at both sites. Bolton will be exploring issues of identity, his role as a white, western artist working in an African community, and how that shapes his experience. Simultaneously, his project is a documentary that attempts to record and communicate the cultural and social reality of a place and a moment in time.

Participants from both communities will communicate verbally and visually, transmitting messages through a variety of technologies to the Other site. Visual documentation (hardcopy images and video) will be displayed at the Corcoran, and a "live" Internet connection will be presented on computers at the University of Maryland. Structured distribution to area as well as distant public schools and community sites on the Internet will allow a widely dispersed exchange of ideas across diverse cultures. Project objectives include fostering engagement of different people within communities and between communities, and exploring issues of identity in a world which remains extraordinarily diverse at the same time that it is shrinking to a "village" due to the technologies of communication.

*School and Community Interaction:* Bolton will conduct courses and workshops during a residency at the Corcoran and at Maryland from September to December. Ideally, students, artists and anyone from the communities at both sites will be able to exchange ideas and images with the Ivory Coast site as well as between downtown Washington and

College Park, Maryland, and to other community and school sites. Students in the public schools will be able to transmit their composite self-portrait as members of the "digital village" to the exhibition site in the Ivory Coast. At the University of Maryland, students enrolled in courses connected with the Getty MUSE Site Licensing project will create multimedia projects incorporating digitized images of art and artifacts from West Africa and the peoples of the Ivory Coast. These multimedia projects will be displayed in The Art Gallery.

**Alan Dunning:** *The Lost Dimension: An Internet City.*

Participants from around the world will design and construct an ephemeral city by typing detailed textual description into online computers at their homes, workplaces, or at the Gallery site in College Park. The verbal description will be translated by the artist into an interactive, three-dimensional rendering of the city, a "walkthrough" animation which allows the viewer in the Gallery to choose where to go by clicking on the computer screen while exploring this urban environment. As new textual information is contributed, the artist will periodically update the rendering of the city. Viewers in the gallery will watch the city being "built" by observing both the evolving textual description and the "walkthrough" on monitors. Both text and visuals will also appear as large scale video projections on the gallery walls.

*School and Community Interaction:* A two-week workshop led by Dunning will involve a group of students and artists from various disciplines working together at the University of Maryland to "build" the city. Students in schools with Internet access can add to the text and then visit the gallery site to see the results of their additions. Or, they may use the idea of designing a city community as a starting point for a project in social studies classes.

**Lynn Hershman:** *Lorna and America's Finest*

As the first interactive video disk artwork (1979), Lorna features a heroine who suffers from agoraphobia. Viewers intervene in the narrative and determine her fate by selecting channels from the disk by a standard remote TV control device. America's Finest is an imitation M16 rifle constructed by the artist in silver. The viewer/user handles the rifle which is attached to a swiveling mount, and aims it in any direction

he/she chooses in the gallery. Once the trigger is pressed, the objects at which the user has previously aimed are projected into the camera's sight. Merged with this scene, however, is an image of the user him/herself, as well as documentary clips from war horrors which have been saved on a computer. Thus the viewer/user finds him/herself in the vulnerable sight of the gun with history's atrocities surrounding him/her.

*School and Community Interaction:* In the on-line Web pages for the exhibition, clips from these projects will be available for viewing, and schools may elect to use the topic of violence as a starting point for portraying communities plagued by violence or ideal communities without violence. Classes that visit the Gallery on the campus of the University may lead discussions about how violence elicits further violence, and then create computer-mediated works relating to this topic.

**Richard Lowenberg:** *Tele/Comm/Unity from Telluride RADical LABORATORY*

A community-of-communities connection between Telluride, Colorado, and College Park, Maryland emphasizing cross-cultural communications, virtual collaboration, and interactively produced works of literature, visual art, music, and performance. The installation will use the World Wide Web with links to [one.telluride.co.us](http://one.telluride.co.us) which will be projected from a computer onto a wall in the Gallery. In addition, a 12 x 12-foot digitally-imaged and printed collage/map of the Telluride region (a small mountain community in Colorado) will be mounted on an opposite wall. On-line browsers will have access to the Telluride Arts Consortium; the InfoZone Gallery; and the Telluride Radical Laboratory -- organizations which upload information and images through their own Web site in Telluride. In addition, Lowenberg will present images from his series titled Information Revolutions, photographic images produced with nightscope and infrared equipment primarily used by the military. If funding allows, the mirror version of this will be installed in Telluride, including a map of the College Park area mounted in that space.

*School and Community Interaction:* Lowenberg's project is structured in such a way that public schools in the Maryland and DC area can contribute by sending Telluride descriptions and portraits of the mem-

bers of the "digital village" community in the region nearby College Park.

**Manual (Suzanne Bloom and Ed Hill):** *The Constructed Forest (This is the End -- Let's Go On -- El Lissitsky.)*

A study of the general relationship between culture and technology and specifically, the transformation of forests by technology and computers. A conceptual framework for the entire work is the parallel which can be drawn between the historical-materialist ideas of the Russian Constructivist Art movement of the 1920s and the destruction of forests in the latter part of the 20th century. This installation consists of 10 large (24" x 40") electronically constructed photographs which are "bung" in walls constructed from raw wooden two by fours, a digitally edited video tape which documents many of the processes of logging and saw mills, and an interactive CD-ROM which offers the user an opportunity to investigate in greater depth the issues presented by the installation. It also contains an interactive dictionary defining persons, terms, and ideas from the divergent worlds of Forests and Constructivism.

*School and Community Interaction:* At the University of Maryland, a workshop of about one week offered by the artists will focus on using multi-media software for creating art. In addition, selections from the project will be displayed through The Digital Village Web site so that students on line can use these materials as a starting point for projects with an ecological focus.

**Christine Tamblyn (with Marjorie Franklin, Paul Tomkins):** *She Loves It She Loves It Not: Women and Technology.*

An interactive CD-ROM installation consisting of texts, sound, movie clips, and images about women's use of technology in the past, present, and future. This project highlights the importance of computer interfaces that are more user-friendly for women. A female persona in cyberspace serves as a guide to the system. The objective of the work is to encourage a more productive relationship between women and technology.

*School and Community Interaction:* Tamblyn will conduct three days of seminars on the relationship between technology and women, at the

University of Maryland and at the Corcoran. Highschool students will be invited to attend. In addition, small sections of the project will be presented through the Web site for the exhibition, so that on-line visitors at schools and elsewhere can sample some of Tamblyn's ideas. Female students in middle and highschool thinking about careers in the technology might wish to use some of Tamblyn's ideas as they create their self-portraits.

**Joan Truckenbrod:** *Everydayfamily*

This interactive installation explores alternative family structures and childrearing in the US. The artwork consists of a "homey" bedroom, a video camera and computer hidden within the nightstand and mirror, and a monitor disguised in a TV. Participants will explore images, text, and sound on a CD-ROM and look through an old scrapbook while watching a TV screen (computer monitor). A hidden camera will then capture video images of the participant and project them over images on the TV screen so that the participant becomes personally involved. The viewer's location in the scrapbook and the pressure placed on a particular image will determine the image displayed on the screen. The artist's objectives are to "challenge viewers to examine the way they feel about families and alternative family structures, and to stimulate awareness of the need for social, economic and political support for both alternative family structures and child rearing."

*School and Community Interaction:* Truckenbrod will install her piece during a residency, inviting students to assist her. In addition, she will teach workshops using a variety of graphics software programs. Students will explore the multiplicity of digital media including visual imaging and sound imaging, and combining these into short animated sequences; different modes of creative expression using the computer as the lens of a camera, the stroke of a brush, and the gesture of the hand. They will create maps of experience that synthesize various layers of reality; infuse photographs with hand drawn images, animated images with a performative aspect, a painted image with sound, to create a new gestalt.

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## Report from the AAM Meeting What Was New in the Exhibit Hall

by Katherine Jones-Garnil

### New Approaches

The **Museum Computer Network (MCN)** teamed up with LibertyNet, the George Eastman House, and Eastman Kodak to bring Internet and Multimedia applications to the AAM MuseumExpo '95.

**LibertyNet** [University City Science Center, 3624 Market St., Philadelphia, PA 19104; 215-789-8807] is a nonprofit organization providing Internet services to the region. It provides area residents with a low cost method of interaction with the region's civic, cultural and educational resources. Look for information on regional museums via the LibertyNet home page: <http://libertynet.org>.

At AAM, LibertyNet provided a gateway for Internet services for conference attendees via a T-1 connection funded by MCN. This allowed MCN booth staffers to demonstrate the features of the Internet such as Netscape to those who had never surfed the Net or help novices learn new skills. MCN also published a home page for the AAM meeting that provided information on the conference with daily updates.

Roger Bruce and Rick Hock from the **George Eastman House** [900 East Ave., Rochester, NY 14607-2298; 716-271-3361] gave a walk-through of the new Edgerton CD-ROM which is part of the exhibit on "Doc" Edgerton at the Eastman House. **Eastman Kodak** [Digital & Applied Imaging, 901 Elmgrove Rd., Rochester, NY 14653-5219; 716-726-7821] representatives provided a short course in the production of a Photo CD as well as introducing "Event Photography." Booth visitors could walk away with a photographic souvenir of the conference as well as information on the latest in Kodak multimedia products.

The new **Kodak Digital Camera 40** was unveiled for the museum marketplace at the conference. This camera records up to 48, 24-bit high resolution images or 99 "snapshot" images.

### Collections Management Software

**Digital Collections, Inc.** [1301 Marina Village Pkwy., Suite 210, Alameda, CA 94501; 510-814-7200] made its AAM debut this year after having exhibited at the EVA and at the CIDOC/MCN conferences last year. DCI's product, *EmbARK* was reviewed in *Archives and Museum Informatics*, Vol. 8, No. 3, p. 225-260. New since the review is a circulation system for slide libraries which includes bar-coding. This is included in the current version of *EmbARK*.

*ARGUS*, from **Questor Systems** [899 El Centro St., Suite 101, South Pasadena, CA 91030; 814-403-0808] now "does Windows." This implementation has all the features of the other platform with the ease of use and standard interface of Microsoft Windows™. A feature that caught my eye was the hierarchical Site Management component available in *ARGUS*. This feature is ideal for archaeologists, historic preservation agencies and, of course, the State Historic Preservation Officers.

*Multi MIMSY™* from **Willoughby Associates, Ltd.** [266 Linden St., Winnetka, IL 60093; 312-284-6600] has been worth waiting to see. Many of the design features of other Willoughby products are incorporated here. This system runs on Macintosh or PC-Compatible platforms. Several features were of particular interest: Multi MIMSY™'S handling of archival collections and its user interface which puts many functions at your fingertips.

Apologies to other collections management systems vendors not visited, in particular, Vernon Systems, Gallery Systems and Cuadra Associates.

### New Vendors

#### *Interactive Multimedia Vendors*

**New Media Directions** [808 Broadway, Nashville, TN 37203; 615-742-1490] a company based in Nashville, TN gave me an interactive

tour of the Ryman Auditorium and in five minutes I knew more about the Grand Ole Opry than before. New Media Directions creates interactive multimedia presentations for museums as well as the corporate market. This includes museum exhibits, electronic manuals, information kiosks and CD-ROM titles. The company offers a full-range of film and video production. Productions can be geared for Internet distribution if desired.

**The Vivid Group's Mandala® Virtual Reality Systems** [317 Adelaide St., W, Suite 302, Toronto, Ontario, Canada M5V 1P9; 416-340-9290; fax 416-348-9809] allow you to interact with an exhibit environment through "an exhilarating educational experience of body awareness." For example, the system is used to give the visitor the "experience" of zero gravity at the Astronaut Hall of Fame in Titusville, FL. It combines the visitor's image with a virtual environment. Titles include: Volleyball, Basketball, Hand Painting, Shark Bait, Drums and more.

#### *Digital Imaging*

**DigiFilm™ Digital Imaging** [119 W. 57th St., Suite 207, New York, NY 10019; 212-974-0500] provides electronic scanning and archiving of photographic collections to Kodak Photo CD. The company also produces interactive multimedia presentations using Kodak Portfolio CD.

#### *Internet Services*

*Museum ONLINE Resource Review (MORR)* is an online directory published by **Overall Knowledge Company** [30 W. Broadway, 9th Floor, New York, NY 10007; 212-346-7776]. MORR (<http://www.okc.com/morr>) is a directory of museum activities and resources on the Internet. Overall Knowledge Company (OKC) based in New York City provides Internet resources for museums and other organizations including design and authoring for the World Wide Web. □

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## SOFTWARE NOTES

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### Deriving Business Rules

According to **BUSINESS WIRE**, April 27, 1995, **DBStar, Inc.**, was to announce the availability of the **DBStar Migration Architect V3 Release 3.5**, the newest version of its automated data tool engineering toolset. New features include a four-fold increase in automated inference speed, the key function of the toolset that automates the recovery of the business rules for data from any legacy system.

Knowledge of business rules is necessary to convert any set of heterogeneous databases into a reliable relational data model or database design that preserves the data integrity previously maintained by program mechanisms in the legacy system. Coupled with the product's existing capability for resolving data element synonyms across heterogeneous databases and integrating them into a scheme-wide data model based on data rules, the **DBStar Migration Architect** sounds like it might be a useful tool:

- consolidating diverse databases into a relational database
- migrating a legacy application or system to client/server

- designing a reliable, maintainable data warehouse of any size or scale.

As far as we know, **DBStar, Inc.** is the only provider of automated tools to transform any kind of legacy data into a relational database design. Dr. Dina Bitton, president and founder of **DBStar, Inc.**, developed the prototype technology for **DBStar Migration Architect** at Cornell University during the 1980s. Dr. Bitton founded **DBStar** in 1993 to further productize and market the technology behind the **DBStar Migration Architect**, **DBStar's** automated data engineering toolset. [**DBStar, Inc.**, 185 Berry Street, Suite 5501, San Francisco, CA 94107. Telephone: 415-512-0300. Fax: 415-512-0302. email: [infodbstar.com](mailto:infodbstar.com). □

### SGML and WWW

The U.S. National Center for Supercomputing Applications (NCSA), (creators of the Mosaic World Wide Web browser), Synex Information AB of Stockholm, Sweden, and SoftQuad, Inc., of Toronto, Canada, are pleased to announce the availability of **SoftQuad Panorama**, a freeware viewer for full SGML on the Web.

In addition, Panorama employs some of the linking capabilities made possible through HyTime and is the first end-user HyTime application in the world (to the best of our knowledge). It also supports TEI pointers for linking, CALS tables, and use of an SGML DTD for stylesheets. (SoftQuad and Synex have already committed to supporting DSSSL Light when it becomes available.)

The current version runs only on Microsoft Windows; others will follow soon. The software, including online manual, a set of DTDs, stylesheets, and table-of-contents-generators called navigators, may be reached through <http://www.oclc.org:5046/oclc/research/panorama/panorama.html>.

OCLC, the Online Center for Library Computing, host of a new suite of SGML Web resources and demos created by SoftQuad, is the first site licensee of the commercial version of the software, called SoftQuad Panorama PRO. The NCSA has agreed to host an "SGML on the Web" page, which will contain pointers to a variety of SGML resources, but in particular will act as the SGML equivalent of the NCSA/GNN "What's New Page," the announcement board

for interesting new Web sites. That address is:

<http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/WebSGML.shtml>

(An html file at the same site makes that information available to people without an SGML viewer too ). If you have SGML content to put up on the Web, please fill out the form attached to the WebSGML page. [For further information, please contact panorama@sq.com] □

## QuickTime VR Authoring

**Apple Computer Inc.** [APDA, Apple Computer Inc., P.O. Box 319, Buffalo, NY 14207-0319; 1-800-282-2732; fax 716-871-6511, AppleLink APDA; Internet [APDA@applelink.apple.com](mailto:APDA@applelink.apple.com)] released the QuickTime VR Authoring Tools Suite 1.0 in mid-May. The standalone product lists at \$495, with MPW Pro at \$695. Both products plus a three-day authoring course cost \$1995. It will ship with run-time versions for Macintosh and a beta version of the run-time software for Windows with the final Windows release to follow as a free upgrade.

The royalties are structured so that uses of QuickTime VR in run-time for fewer than 25,000 units of CD-ROM and fewer than 50,000 of enhanced audio are free. For more than 25,000 CD-ROM copies the fee is \$400 per 5,000 units.

At the same time Apple announced that its Apple Media Kit, consisting of the Apple Media Tool (for authors, designers, and educators) and Apple Media Tool Programming Environment (for programmers), will no longer carry any run-time royalties. The Apple Media Kit lists at \$1195 with discounts for educational users (the Apple Media Tool alone lists at \$599).

QuickTime VR, because it requires no special hardware besides a personal computer and mouse, offers educators and museums an opportunity to simulate real-world experiences at a reasonable cost. The relatively high resolutions and small file sizes and the cross platform/low-end system delivery environment, make the product particularly exciting for educators. □

**Cuadra Associates** [11835 W. Olympic Blvd., Suite 855, Los Angeles CA 90064; 310-478-0066; fax 310-477-1078] has re-

leased a client, STAR/Web, to allow assisted searching by users accessing Star databases from the WWW environment. Netscape or other NCSA-compliant browsers can now have full GUI interface access to the structured and full-text search facilities available to local Star users. Those with existing Star databases can, obviously, benefit immediately by making their data available worldwide.

**Cactus Software, Inc.** [10 West 15th St., Suite 720, New York, NY 10011; 212-647-1470] has announced Minaret with Imaging as a \$750 add-on to existing MS-DOS versions of Minaret. The new capability includes reading images in GIF, TIFF, TARGA, BMP, and JPEG, and requires minimally a VGA monitor and a 80386 or higher PC. The basic Minaret database is available for MS-DOS, MS-DOS networks, and UNIX on PCs or the IBM RS/6000.

**Silicon Graphics, Inc.** [2011 North Shoreline Blvd., Mountain View, CA 94039, 415-960-1980] and **Template Graphics Software, Inc.** [9920 Pacific Heights, La Jolla CA 92037; 619-457-5359] have developed WebSpace, a 3D graphical Internet interface that works in concert with WWW browsers. WebSpace supports

Virtual Reality Modeling Language (VRML) and an open, platform-independent file format for 3D graphics. Because VRML is infinitely scaleable, users can navigate through objects, models and virtual venues at any scale. Beta versions have been downloadable for free for major Unix platforms, Windows, and Macintosh, but Template Graphics offers supported versions for only \$49. SGI's Open Inventor object-oriented 3D graphical toolkit provides a VRML-compliant authoring environment.

**VocalTec** [157 Veterans Dr., Northvale, NJ 07647; 201-768-9400; fax 201-768-8893] is selling Iphone, the Internet voice communications package that allows Internet users to make long distance calls across their Internet connection at the cost of a local phone call. Iphone can be purchased for \$99 or in a kit that includes the software, a speaker phone with handset, and a PC sound card with voice compression capability. For around \$375, it will soon include a Motorola Power Class 28.8 modem. A free 90-second demonstration of Iphone is available at <http://www.vocaltec.com>. Just how long the telephone companies will put up with it remains to be seen! □

## Word Processors add HTML

Microsoft Word 6.0 Internet Assistant allows a user to take an existing word processed document, save it as an html document, and view it through a Web browser. The patch from release 6.0 to release 6.0B which is required for this and the Internet Assistant itself are available free from Microsoft on the network at <http://www.microsoft.com>. Those who have tried say the software works as advertised, although it is not as functional as some html editors. □

## Interactive WWW

Not very many WWW sites support Interactivity well, but some interesting applications are beginning to emerge that may pre-empt a more interactive future according to *Interactive Age* (May 22, 1995, p.20). They are made possible by the Common Gateway Interface (CGI) protocols scripts which extend http to allow for forms, image maps, custom searches and gateways.

- \* fX Networks built a "graffiti wall" top allow visitors to do

their thing at <http://www.fxnetworks.com/fx/fxtop.html>

- \* Scholastic Inc. has made extensive use of search engines and moderated users groups at: <http://www.scholastic.com.2005>
- \* MIT is exploring ways in which users can learn of others with common interests through searching input (on musical tastes) by others at: <http://media.mit.edu/ringo>

Tools for interactive applications are not hard to find.

- \* The net.Form utility is at: <http://www.netgen.com/products/netform/netform.html>
- \* Games are at: <http://www.cs.cmu.edu:8001/afs/cs.cmu.edu/user/zarf/www.games.html#games>
- \* Voting tools are at: <http://www.grady.uga.edu/vote/vote.html>
- \* Searching tools can be found at: <http://www.netgen.com/cgi/wandex>
- \* Image maps are at: <http://george.lbl.gov/ITG.htm.pg.docs/dissect/dissect.html>

I'm convinced the future of networking lies in enabling two-way communications. After all, the resources to which we are now

providing access in passive mode are not different in kind from those within our libraries, archives, and museums today, and while access is slightly easier by networked communication, this advantage will be reduced or erased as the volume of networked information grows. □

## NOSE

Immediately after returning from hearing Daniel Keys Moran tell the Coalition for Networked Information that humans in the next century would have their senses of vision, hearing, and smell enhanced by computer techniques, I encountered an article in *The Economist* (April 15, 1995, p.76) on NOSE (Neotronics Olfactory Sensing Equipment) from Neotronics, a manufacturer of scientific equipment. The commercial smelling device (one of at least two on the market) has 10,000 sensors to uniquely identify smells as specific as trademarked items, species of fish, or mixes of specific varieties of coffee beans. Food, drink, and perfume companies are anxious to acquire these devices to ensure quality control and enforce patents. Inspectors of foods, drugs, and exhausts are acquiring them to

detect spoilage, smuggling, and emissions. Doctors are finding them useful for identifying specific bacterial infections. They are relatively cheap, especially compared to human noses, and much more consistent and precise. It will be interesting to see how these devices are incorporated into everyday things in the next decade.

□

## Hands on Hypermedia & Interactivity in Museums

**ICHIM '95**  
*The Third  
International  
Conference on  
Hypermedia &  
Interactivity in  
Museums*

**MCN '95**  
*The Annual  
Conference  
of the  
Museum  
Computer  
Network*

**October 9-13, 1995**  
Hotel del Coronado  
San Diego, California USA

**For detailed registration information:**  
412-683-9775 (phone) 412-683-7366 (fax)  
74543.2367@compuserve.com

## STANDARDS

### Australian Records Management

Standards Australia issued DR95194-95199, a draft standard on records management, on May 1, 1995 for comment by June 30. Whether or not you have an opportunity to comment, the draft should be studied carefully because it is a clear statement of the new role of archives and records management. My interests are especially in part 1, General Requirements (DR95194) and part 2, the "Strategies for Documenting Business Activity through Recordkeeping" (DR19195).

The standard proposes guidance, as a voluntary code of practice, rather than prescribing solutions. It does, however, explicitly cross reference the ISO 9000-9004 standards in a forward that begins:

Records management is that part of the management of an organization which provides a service that is concerned with

- (a) meeting the needs, and protecting the interests, of the organization and its clients, and
- (b) capturing complete, accurate, and reliable documentation of organizational activity to meet legal, evidential, and accountability requirements.

After definitions, the general requirement begins with "Responsibility," including assignment of responsibilities, awareness of regulatory requirements, and design and implementation of recordkeeping systems. "Recordkeeping systems contain information which is linked to activities that they document. Their purpose is to capture, maintain and provide access to evidence of transactions over time as required by the jurisdiction in which they are implemented and in accordance with common business practices."

The first section includes a Model Implementation Plan and a discussion of the systems conversion issues.

Part 2 "covers the strategies that should be adopted by organizations to ensure that adequate evidence of business activity, in the form of transactional records, is created to meet the needs and protect the interests of the organization..." It was designed to serve "as a benchmark for use by chief executives, senior management, or auditors to assess whether adequate records are being kept in their organizations, business units, programs or projects; and by investigative bodies, the courts, and any other person or body to whom or which the organization is accountable, to assess whether adequate records have been kept in specific cases."

The standards specify that:

"Business activity should be documented by making (i.e., creating and receiving) full and accurate records of that activity and capturing them into recordkeeping systems."

It specifies that records are full and accurate to the extent that they:

- (a) facilitate action by employees at any level and by their successors
- (b) make possible a proper scrutiny of the conduct of business by anyone authorized to undertake such scrutiny; and
- (c) protect the financial, legal, and other rights of the organization, its clients and any other people affected by its actions and decisions."

The standard then lists the Functional Requirements for Recordkeeping (Compliant, Adequate, Complete, Meaningful, Comprehensive, Accurate, Authentic, and Inviolate) and discusses strategies for satisfying these, including policies, business rules, and procedures, assignment of responsibility, and incorporation of the requirements into practices.

Overall, the standard builds from and elaborates upon the proactive program for recordkeeping and the functional requirements I have been developing for the past several years. I can only say that I am delighted by it, and by its intelligent extension of theory into the realm of practice.

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## STANDARDS NOTES

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### High Definition Compatible Digital (HDCD)

A technology developed by Pacific Microsonics, a small Berkeley, California company, seems poised to transform the sound of CD-Audio. The encoder, used in the studio adds extra aural information and reduces distortion. The decoder, a chip in a CD player, allows the sound to play back much better than current CDs, even when the disc being played is a standard CD-a. Pacific Microsonics will not charge a royalty on HDCD discs, so no extra costs will be incurred by the consumer. Instead they are focusing on the disc player manufacturers and the studios, and there they are having significant success. Soon we can expect to see numerous HDCD discs and players, and, possibly, a new generation of high fidelity sound.

### Minimum Data Categories for Cultural Objects

At the July 3-9, 1995 meeting of the International Council of Museums, two major contributions to the discussion of minimum data categories for object description will be unveiled. The

first is the result of a survey, "International Documentation Standards for the Protection of Cultural Objects," funded by the Getty Art History Information Program and the Council of Europe, which is the first stage in the creation of an International Core Documentation Standard. The survey involved police and customs agencies, documentation centers, and museums and galleries around the world will be described by Robin Thornes, author of the report to be distributed at CIDOC. The second report, by a CIDOC committee chaired by Toni Peterson (AAT) and Alice Grant (National Museum of Science and Industry, London), is entitled "Minimum Information Categories for Museum Objects: Proposed Guidelines Towards an International Standard."

### Model CD-ROM Licensing Agreement

After a year of collaboration, the MUSE Multimedia study Group has issued its first major product, a sample agreement for CD-ROM licensing. The project, partially funded by the Annenberg/CPB Project, was launched in March 1994, and its 34-page

pamphlet [MUSE Educational Media, 1 East 53rd St., 10th fl., New York, NY 10022-4201] was distributed to the many thousands of attendees at the AAM Meeting and will be further distributed through AAM, the American Federation of Arts, and the Association of Art Museum Directors. A version annotated with Canadian legal opinions is under development by the Canadian Heritage Information Network. The agreement contains actual text of model agreements and annotations discussing the issues raised by different clauses. It supersedes agreements such as those I published three years ago.

## Project Cultural Heritage Information Online (CHIO)/CIMI

The Consortium for Computer Interchange of Museum Information was awarded a major grant by the National Endowment for the Humanities that will enable it to undertake the second part of its plan of work for 1995/96 -- the development of methods of linking museum catalogs using Z39.50.

The CHIO SGML Working Group meeting at the CIMI membership meeting in Washington,

DC, on April 12 and 13 reviewed section 8.6.1 of the CHIO Technical and User Requirements, Proposed Principles for CIMI DTD.

**Functional Requirements** [The following is a draft restatement of these principles based on this review.]

8.6.1 Proposed principles for CIMI DTD Functional Requirements

**Draft (April 15, 1995)**

(1) The DTD must allow markup of any text or structured data in the disciplines of cultural heritage that identifies significant format, content, access points, and links.

(2) Different genres of the literature of cultural heritage may require different DTDs.

(3) Cultural heritage information is multidisciplinary. It includes relationships between objects (such as works of art) and people, places, events, documentary sources (such as bibliography and images), ideas/subjects, and other information items. Objects (such as works of art) should have no privileged position. DTDs must allow for the definition of all information items. DTDs must allow

for the definition of authority databases that may be used by the cultural heritage community.

(4) Links may be made between elements within one item and also between separate items. The internal and external linking mechanisms must be uniform.

(5) Any content elements and access points defined in DTDs should reflect the CIDOC data model (or logical extensions to it).

(6) Any content elements and access points defined in DTDs need to be consistently named (or mapped to consistent names). Application guidelines are needed to provide guidelines for producing such consistency.

(7) There is no need to conform to the TEI, but DTDs should use existing conventions (such as those found in the TEI and elsewhere) when appropriate.

(8) Images may be linked to different types of DTDs or DTD elements. Guidelines are needed for specifying what kinds of information needs to be linked to images for different purposes.

(9) Guidelines are needed for specifying the context within which search results of marked up

text are displayed (for examples, paragraphs, sections, or other logical contexts to be defined).

(10) Many creators with many roles may be involved with a single object (such as a work of art). Creator is an agent/role with a specific and defined position in the data model.

(11) The depth of markup should not be prescriptive in the DTD. But guidelines to specify mandatory and optional elements will need to be defined.

(12) The DTD should have a mechanism for applying controlled vocabularies. Guidelines to encourage consistency need to be specified.

(13) The DTD needs to provide mechanisms for language translation (applicable to the DTD itself as well as to translation of element content).

## Imaging Technology Standards

The International Consortium for Medical Imaging Technology (ICMIT), created five years ago by the Imperial College (London) and MIT (also ICMIT!) is about to launch a suite of standards called

DICOM3 that ensure that data generated by medical instrumentation ranging from breaths heard through stethoscopes to luminous cross sections produced by advanced body scanners are interchangeable. Commercial firms, involved in ICMIT from the outset, are going to be quick to offer products based on the standards. Sybase Systems has developed an ICMIT conformant dataserver and others, including Hewlett-Packard and Toshiba, are developing storage and retrieval systems for ultrasound. ICMIT has required development of compression methods to achieve a 40:1 reduction and value-added suppliers are enhancing ICMIT compliant products with intelligence, so that, for example, a magnetic-resonance image of a knee can be edited automatically to show physicians the soft tissue parts they need for diagnosis, unobstructed by bone and tendon that obscure the view.

## Memory of the World Register

In 1992, Unesco established a "Memory of the World Programme" which met in September 1993, December 1994, and May 1995. Prior to the May meeting, papers were circulated that called

for the creation of a Memory of the World Register, linked to national and regional registers, of documentary heritage, such as resides in libraries and archives. It was felt that the documentary heritage was at equal risk to the natural and cultural sites protected under other Unesco programmes and that increased awareness of documentary treasures would help ensure their preservation. Limited funds will be available through Unesco for specific projects if interest can be generated from the commercial sector based on the prestige of the Memory of the World designation. Ultimately the outcomes are intended to include an international convention to protect documentary heritage along the lines of the UNESCO World Heritage Convention.

The Programme has four objectives: preservation, access, distribution of derived products, and awareness. The assumptions are that some documentary heritage -- single items or collections -- are part of the "inheritance of the world:" and will benefit from being so designated. These could include manuscripts on any medium, prints, maps, music and other non-textual items, sounds and images, and digital data whether in private or public hands. The program imagines four

stages: identification, raising awareness of preservation needs, preservation of specific documentary heritage, and marketing and distribution; each strategy is to be pursued at a world, national, and regional level.

An International Advisory Committee has been established with a Secretariat in the General Information Program (PGI) of UNESCO. A fund has been established to accept contributions and methods of affiliation for national and regional programmers have been established. The Memory of the World Registers, which are the foundation of the programme, have been defined and nomination methods and selection criteria proposed. High level preservation, access, and distribution guidelines have been framed and details are under discussion. A document, entitled "Memory of the World Programme, General Guidelines to Safeguard Documentary Heritage," has been prepared for Unesco, on behalf of IFLA, by Stephen Foster and Roslyn Russel, Australian Heritage Projects, Jan Lyall, National Library of Australia, and Duncan Marshall.

*[For more information contact Unesco, PGI, or Jean-Pierre Walot, Chairman of the International*

*Advisory Committee and National Archivist of Canada]*

## SGML Tools

I was recently provided a list of SGML tools and their vendors which is available in the SGML archives (/pub/SGML/\*) at ftp.ifi.uio.no where it is maintained by Steve Pepper. It is an exceptionally useful and regularly updated list indexed by vendor, by functionality and by platform.

## CIDOC Data Model

The CIDOC Data Model is now available by ftp from two sites:

*ftp://ftp.nrm.se/pub/ICOM/CIDOC/MODEL/Relational.Model*  
*ftp://ftp.chin.gc.ca/pub/ICOM/CIDOC/MODEL/Relational.Mode*  
*ID*

Both sites consist of four files: Direct.Relationships (62679 bytes); Entity.Contents.report (140729 bytes); Entity.List (11241 bytes); and Guide.PS (94790 bytes) or Guide.txt (24942 bytes). The Guides are formatted in Postscript or ASCII, but contain the same text.

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## CONTRIBUTORS

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**David Bearman** has been President and Senior Consultant at Archives & Museum Informatics in Pittsburgh, Pennsylvania, since 1986. Previously he served as Deputy Director of the Smithsonian Institution Office of Information Resource Management and Director of the National Information Systems Task Force of the Society of American Archivists. He will co-chair ICHIM'95 to be held in conjunction with the Museum Computer Network in San Diego in October 1995.

**Jayne Bellyk** has been an information analyst in the Data Management Department of the Insurance Corporation of British Columbia since 1991. She was the program coordinator for the "Ancient Science Modern Machines" workshop, and has served on the editorial and education committees of the Archives Association of British Columbia. She is a graduate of the Masters of Archival Study program at the University of British Columbia, having recently completed her thesis "The Use of Information Engineering as a Framework for Analyzing Records in Electronic Form".

**Terry Cook** is Director of the Records Disposition Division at the National Archives of Canada, where he leads a team of analysts and archivists in the appraisal and disposition of government records in all media. He has published widely on archival theory, appraisal, description, electronic records, and archival history, and lectured throughout North America and during month-long invitational tours of Australia and South Africa.

**Katherine Jones-Garmil** was the Data Processing Coordinator for Florida's Bureau of Historic Sites and Properties, and then joined the computer consulting company, DATABASICS, Inc., in Providence, RI, as Senior Consultant. She has consulted in the museum and government communities since 1985. Ms. Jones-Garmil is a former President of the Board of Directors and is currently the Program Director of the Museum Computer Network. She is the Documentation Manager at the Peabody Museum of Archaeology and Ethnology, Harvard University.

**Xavier Perrot** is an information scientist specializing in interactive multimedia and hypermedia for museums. Perrot lectures at the Hypermedia Department at the University of Paris, where he is pursuing his PhD., and is a research fellow of the Studio for Creative Inquiry at Carnegie Mellon University. He also serves as an independent consultant on interactive multimedia content production and systems design and as a regular columnist for Archives and Museum Informatics.

**David A. Wallace** served as the Records/Data-base/Systems Manager at the National Security Archive in Washington, D.C. from 1988-1992. While at the NSA, he also acted as Series Technical Editor to their "The Making of U.S. Policy" series. He is currently pursuing doctoral studies at the School of Library and Information Science at the University of Pittsburgh and serving as staff to Dean Toni Carbo Bearman in support of her role as a member of the National Information Infrastructure Advisory Council.



