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Simple Sound and Motion

With the advent of Quicktime, Apple's new extension to its operating system, we can see for the first time the consequences which simple multimedia cut and paste processes could have for everyday documents and the potential of a new generation of low end authoring tools for archives and museum educators. Using Quicktime, you can locate a short video segment in the middle of your WordPerfect document or put animated graphics in an Aldus Persuasion slide show. As software which can take advantage of Quicktime becomes widely available, we can expect to be able to click on active elements of many screens and hear music or narration and see animation or motion video. Although motion images are now confined to a small window on the screen and are replenished at too few frames per second to provide for smooth movement of rapid changes, the technical facilities are rapidly improving and can be expected to satisfy full screen video requirements within a year.

In the past month I have seen two early implementations of Quicktime in experimental programs for museums. In the first, Alan Newman, Executive Director for Imaging at the Art Institute of Chicago showed me how he could use a few video segments showing shields and masks in the AIC collections being worn in native dance ceremonies to expand the educational experience of visitors and students. Quicktime was, in effect, being used to extend the concept of "labeling" in public displays. This kind of use was not as exacting as the creation of an interactive exhibit, where at present one would have to rely on authoring tools such as Macromind Director or Quest, because the function of the images presented in Quicktime was to give the visitor a sense of the context of use of the artifact, rather than provide them with tools to explore it in depth. A similar use of a Quicktime image of an artifact in a window of a cataloging record is being demonstrated in the most recent release of the inexpensive museum collections package Accession where the developers, have borrowed demonstration files of rotating objects, beating hearts, and moving machine parts to give their museum clients a sense of the range of possible benefits of this Apple utility program.

Quicktime doesn't do things we haven't been doing for several years with special purpose authoring tools, but it is likely to have an impact that far outweighs authoring systems because it puts multimedia editing tools into the operating system. Apple plans to provide access to Quick-

time under Microsoft Windows and A/UX which would extend its impact further. It might be a year or more before most Apple users have sufficient hard disk space, or digital video cameras to take full advantage of these facilities, and even longer before users of other systems have similar facilities available to them, but capabilities like those of Quicktime can be assumed as part of your future information environments just as windowing could be assumed two years ago, and now is the time to think about how they should effect your on-going documentation plans.

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Canadian Heritage Information Network Technology Assessment Studies and Interactive Projects

by Frederick Granger, Project Leader, Chin TAC

1. MUSEUMS ARTIFACTS AND INFORMATION

In the recent past the museum community has been expressing an new second generation level of questions that involve databases of artifacts. The first level where we discuss computers for collections management information, has been thoroughly debated. In many cases solutions have either been found or are being investigated by well qualified study groups. There are in the museum community, few who differ in thinking towards the value of using collections management computer databases.

Second generation questions and option levels involve such topics as "Standards", "Communications Interfacing", "Alternate Uses for Information in Databases" and "Public Access". These second order problematic areas are also overlaid by obstacles such as lack of staff or restriction of available resources including money. Yet the need to address them is considerable given that they include many problems that can be solved with collective discussion. Through mutual dialogue, those issues can be incorporated in our long term programmes. As in the case of the small business world, we in the museum community must be willing to accept alternatives that involve technology products instead of additional staff.

Solutions to many of the second generation options will come about more easily through the development of standards that are prepared by both institutions and commercial technology developers. The aim of such committees is to integrate the needs of the community of museums and provide solutions that can be afforded by the average institution. Another important issue in standards is to integrate services to answer such questions as "what types of image packages can be connected to the CHIN mainframe and how does that effect the local LAN (local area networks) at the user site".

Money will always remain a serious restriction for small museums to modernize or update projects as we experience these financially very tough times. The introduction of a new technology product into any budget tight facility can and indeed must demonstrate that the present method of performing work will be improved, while in an overall programme not significantly increase existing costs.

2. OUR HISTORIC WEALTH

Society has begun to realise that artifacts which can express our culture, our history, and indeed our origins, have not in the past received the support needed to collect and preserve them for this and future generations. In our society there is a growing awareness of our rapid change in lifestyle as we quickly shift from an industrial

based economy towards an more information based service structure.

That shift is effected by global orientation where it is found to be a better cost strategy to transfer new technology product manufacture to the second and third worlds. Most products are invented, designed and tested in North America yet are manufactured or assembled in lower wage earning regions of the world. This continued change has radically altered our economic structure. Our social fabric has been permanently redirected. Where factories once stood international trading and consulting firms now conduct new businesses. This process has made obsolete many of the once familiar objects of our lifestyles.

Museums are now by almost salvage programmes, engaged in quickly gathering the wealth of historical perspective left over by the rapid change of our social structure. Within two decades we will be looking back at somewhat of a vacuum, if the museum community fails to gather those objects. The perspective is now "Future History". In the past the change was gradual and we could manage the slower input of the artifacts as they became historic. The present pace of change is accelerating almost without control.

3. SPECIAL COLLECTIONS

We have seen many small museums that specialize in a specific discipline or indeed even into a single artifact type such as automobiles emerge over the last thirty years. Instead of being consumed into a large institution, people willing estates have decided to place these collections into the trust of municipal or local governments. Although their light is bright for a period of time, the money that affords the upkeep diminishes and many collections are subject to the constraints that pose considerable problems on the ability to provide the services needed. These facilities as well need our help towards using technology that will provide access while maintaining sufficient security in collections management. This also must be done within limited budgets.

4. ARTIFACT SECURITY

Recent thefts have made it quite evident that we must also secure better our wealth of artifacts. Most of us are sufficiently cautious as to photograph our household valuables for both insurance and theft identification and yet we do not have all of our museum artifacts imaged. During the last two hundred years the scientific community through research ventures have produced or accumulated massive collections of both physical objects or written research studies. This wealth of learning and respect for our history now being offered to our museum visitors, has awakened our society to a new regard for that heritage and the need to accommodate our past into the present. Paralleling this awareness has been an increase in the monetary value in objects of art and artifacts. With the increase in value also comes the number of thefts that plague the museum and gallery world. All types of works of art are being stolen every day in the world. Some struc-

tures have been developed to assist our community in the tracking and return of stolen objects. The Repository Of Stolen Art and Artefacts, a facility developed by the Ottawa office of Interpol is discussed in more detail below.

5. CHIN, A MUSEUM SUPPORT SERVICE

The purpose of mentioning these peripheral topics to this point is to now provide some second generation references and solutions that are a part of the CHIN (Canadian Heritage Information Network) facility services. Viewing the global mandate of our museum community to collect, document, preserve, secure, and on the other arm then to exhibit and educate all from these collections, produces considerable strain on the limited staff and budgets. Intrinsic to this undertaking is the need to provide a national or cross-provincial account to the accumulation of our artifacts.

The Canadian Heritage Information Network (CHIN), is a unique program of the Arts and Heritage Sector of Communications Canada. The Network was developed to establish a comprehensive inventory of Canadian museum collections and to provide collections management services to institutions in all regions of the country. It is also responsible for providing a consultative service on new technology.

CHIN provides a liaison with the partners of the museum and gallery community. CHIN houses a mainframe computer facility on which is stored records or information files on most of the collections in Canada. Access to all these records on a mainframe unit, provides the opportunity for participating museums to search out artifacts which can be used to develop research or new exhibits and to enhance existing displays. The program began in 1972 and has grown continuously ever since. Today the system contains information on 12 million objects and provides communications to over 400 institutions, in all regions of Canada and in more than 22 countries throughout the world.

Drawing on the collections of participating institutions, CHIN has established two National Databases, one for Humanities and one for Natural Sciences. Network users and the public can consult these databases for a variety of purposes such as research, cataloguing, and preparing for loans and exchanges. As well, there is information to assist planning in-house or travelling exhibitions and for locating artifacts and specimens. Reference databases on CHIN provide users access to specialized information. For example, the Atlantic Canada Newspaper Survey is an exhaustive analysis of goods or services offered for sale in Atlantic Canadian newspapers prior to 1900. ROSA, the Repository Of Stolen Art and Artefacts developed by the Interpol Ottawa branch of the Royal Canadian Mounted Police, acts as a comprehensive record of art stolen in Canada and elsewhere.

Another service offered by CHIN, is the facility for the Conservation Information Network (CIN). This is a collaborative venture with the following other institutions:

- » Communications Canada's, Canadian Conservation Institute
- » Getty Conservation Institute
- » Smithsonian's Conservation Analytical Laboratory
- » International Centre for the Study of the Preservation and the Restoration of Cultural Property
- » International Council on Monuments and Sites
- » International Council Of Museums

The Conservation Information Network provides information of interest to the conservation community, including bibliographic references, information on commercial products used in conservation and suppliers and retailers of these and related products.

Other new services in CHIN involve research into areas of standards and museum documentation, through fellowships. The Fellowship Programme will accommodate researchers working at the CHIN site, who may work in-house for a period of one year and have access to the CHIN facility. Another new direction for CHIN is the assistance being provided the "Regional Networks", that are developing across the country. Each region is a gateway that involves a number of local museums, connecting them through to the CHIN facility.

6. TAC, A NEW CHIN FACILITY

CHIN acts in a consultative role for the museum community, providing advice in the area of collections management, database management and development, and has recently opened a facility for technology assessment. The Technology Assessment Centre supports a programme of research into technical enhancements for database management, the primary area of concern at this stage being image and text interfacing. The Technology Assessment programme's main purpose is to objectively assess new and emerging technologies as they apply to the museum environment and to develop standards for museum systems. Technology is constantly evolving. New software and hardware are cited as providing a potential for enhancement to collections management. Tests conducted on new devices at CHIN are to be published. A client need not purchase and test a set of similar commercial offerings. Thus, the museum community could save funds and staff time when information is needed on new products.

7. IN-HOUSE TECHNOLOGY PROJECTS

During the last year, the TAC has tested and developed, through in-house and commercial contracts, applications involving image-text systems which incorporate digital and analogue images into database records. A series of ongoing research involves other topics such as image compression, transmission, storage and audio interfacing.

One of the projects undertaken this year was one related to the Repository Of Stolen Art and Artefacts. To investigate digital and analog image structures, the TAC provided two projects for Interpol Ottawa. The first, a portable demo package, used in the Eighth United Nations Congress of the Prevention of Crime and the Treat-

ment of Offenders held in Cuba during 1990. The demonstration package involved several hundred images from the ROSA, in digital form, that were connected to a microcomputer database. It was used as a presentation to the members of Interpol, as what is technically possible. It supported the Canadian resolution that was adopted out of the conference, involving the assistance in development of a worldwide network that will enhance communications and provide rapid access to information about cultural property losses.

The second project was the conversion of all the existing images, approximately 10,000 items, in the Ottawa Interpol office, onto an analogue optical disc system and the interfacing of the images with the existing ROSA database on the CHIN network. Providing an international inventory of stolen objects, throughout the world to museums, archives, galleries or auction houses, can yield a considerable opportunity to recover many stolen objects. In the longer term, the process impedes and restricts the crime of art theft. The better the net, the fewer the escapes. As well, the more aware the buyer or collections custodian is of the ROSA database, the more difficult is resale.

The purpose of the project was to provide Interpol Ottawa, with an "office tool", that considerably expedites the access to images of stolen works of art in the database. Additional modifications to this office tool such as to distribute the image database for interested users, have been discussed.

To augment ROSA on the CHIN mainframe, the TAC undertook to integrate those captured images on a microcomputer at the Interpol office with the database on CHIN which had to be updated to provide frame numbers of the locations of the appropriate artifact images. Some additional software for the micro had to be developed for communication between the host text database and the on-site optical disc player. When a video printer was added to the office system, the image of the artifact could be printed along with the ROSA database text as output from a search.

The original images that are provided from Interpol, vary in size from several millimetres to photographs that measure some 8 by 10 inches. As well, a considerable quantity of material, was photo-copied from international FAX transmissions. Most of those FAX images had to be enlarged, in order to view an object. Using a video camera allowed expansion without any of the normal increase in noise associated with photocopy work. A video printer at the end of the microcomputer chain produces a large print and thus serves well for object identification. All of the backlog of years of images have now been recorded onto the optical disc system. The present structure, involves the monthly input of material provided to Interpol by police agencies and the international reports on thefts. There is provision to capture the information or image into the system immediately, if there is any expression of urgency.

8.. OTHER TECHNOLOGY PROJECTS

A feature of the TAC is in an ongoing process of testing various technology elements for the purpose of developing tools that can be used by members of the Canadian museum community. A recent completed project, involved the production of a CD-ROM disc, for ICOM, (International Council Of Museums) where under a study for CIDOC (International Documentation Committee) CHIN had processed images from seventy museums, in nineteen countries, on the topic of Dutch and Flemish art Masters. This was a test project to study CD-ROM technology. The CD-ROM contains three hundred and eighty nine images; slides of works of art from the Dutch and Flemish Masters. On the disc are a number of formats, that can be used from VGA (a standard monitor/card set), an SVGA (super or extended VGA graphics), Targa (any of the AT&T Truevision cards), and DVI (an Intel display board set). The full database program and image access commands are also included on the disc. The resulting package is quite effective, and is available for purchase from ICOM through CHIN, as an example of the interactive technology, and the beautiful works of art.

Studies are ongoing in the area of merging sound text and images to produce an enhancement to collections information access. Old audio 78 rpm discs, are audio recorded for their sound. The image of each of the labels is also computer captured. The information on the disc is entered into a database which can be transferred onto the CHIN mainframe, or used from the host microcomputer. All three of these components, sound, text and image, are thus automated for access. This has been undertaken to provide a demonstration of DVI potential in museums.

Another field being investigated is Document Imaging. In this process of producing the "paperless office" all the paper is scanned (digitized), and connected to databases of collections. In such a fashion, additional forms related to an artifact, can be interfaced with the textual databases.

The Technology Assessment Centre, is to operate under a continual and ongoing programme of testing such products or systems that can support the museum community. It is very important that CHIN keep itself informed on technologies that constantly come on the scene. Also important is the distribution of research material. We intend that future CHIN publications will provide the museum community results of TAC research. Where we can test and produce references to applications with potential support for the museum community, we will endeavour to keep everyone informed. Through partnerships with vendors, universities and the museums, we may also investigate or test for solutions that effect their specific technology requirements. It is hoped by undertaking such programmes as technology assessment in support of the museums, that we will collectively be able to develop standards. This procedure will permit more effective interchange of information between facilities in our community which is the main objective of our programme.

The Use of Optical Disc Technology to Improve Access to Historical Photographs

by Michael B. Moir, Toronto Harbour Commission

Keepers of cultural material, be it in the form of archive or artifact, constantly face the daunting challenge of providing access to ever-growing amounts of information¹. Many museums are burdened with the knowledge that exhibit areas can accommodate only a small percentage of their collections, the veritable tip of an iceberg that lies in storage and is usually unavailable to all but the most specialized of inquiries. The situation faced by archivists is similar, and just as overwhelming. With the possible exception of a handful of records chosen for display, the treasures entrusted to their care remain locked away in stack areas, where walls of grey, beige and brown boxes create a formidable barrier to those unable to decipher the significance of the numeric codes that mark their sides. Archivists have often been eager to seize upon new technologies in the hopes of improving access to this fortress of information, but the potential of new gadgets to solve old problems does little to simplify present difficulties when archivists are hesitant to proceed with the acquisition of systems that seem out of date with the arrival of next month's trade journals.

This is particularly true for the use of optical disc technology in the management of cultural information. Within the past few years, advances in the storage of data in a digital format on an optical disc have apparently surpassed the previous limitations of analog systems. The recording of information in this more permanent and flexible format has won a place in the minds and budgets of large cultural institutions such as the National Archives of Canada. The success of the digital approach has given analog applications a reputation in the minds of many curators and archivists as being something akin to a dinosaur, facing the threat of extinction that befits all obsolete systems. Yet the situation is by no means so simple and straightforward, particularly for smaller repositories whose dollars are limited and cannot support the development of sophisticated applications. Both approaches possess strengths and shortcomings that are unique to their format which must be carefully weighed against the requirements of a specific situation. The decision is somewhat akin to an old ballad that begins with the line: "Oh you'll take the high road, and I'll take the low road, and I'll be in Scotland before you." In this case, the destination is information, particularly its speedy identification and retrieval. The paths refer not to shadowy allusions to life and death, but to the unsettling complexities inherent in choosing the appropriate storage format for an optical disc system -- a dilemma that faced the Toronto Harbour Commission when it took what some consider to be the "low road" in the face of the enticing possibilities of high technology².

Access to information is one of the primary functions of any archival repository. It is the need to consult the historical record in a timely and effective manner that provides the rationale for many a programme devoted to the management of information, particularly in a corporate setting. While physical access to the record is certainly important, the key step in this process is the preparation of finding aids that allow users to identify the desired information. Few would argue that the description of a record in a manner that best reflects its contents is perhaps the most persistent and demanding challenge that has faced the keepers of this information. Ranging from the clerks that laboured over their calendars to the 'techie's' that design data bases, much time and effort has been invested in the preparation of finding aids that bring together researchers and those ever elusive gems of information that users are certain must lurk amidst the holdings.

Textual records have generally fared well under this attention. Their original arrangement has usually reflected subject classifications or other functions that have facilitated the description of written material. A list of file titles, for instance, will help most users piece together a paper trail through mountains of information. Graphic records such as technical drawings, maps, and photographs in particular tend to be more problematic. Arranged in a manner that often reflects their chronological order of creation or, at the very worst, the order in which they were stuffed into a drawer or box, these materials usually defy easy description, analysis and classification at a collective level. While a record series or file title might pull together hundreds or even thousands of pieces of paper into an artificial unit held together by the subjective nature of its contents, photographs offer no easy solutions to dealing with the wide and disparate ranges of information that can appear within a single image.

Traditional methods employed by archival repositories to provide access to historical photographs have ranged from the preparation of photocopies or modern prints stored in file folders that are arranged by subject, to the reproduction of the entire fonds or collection as either photocopies, microform, or contact prints stored in binders that allow users to browse to their hearts' content, and to the preparation of image-bearing catalogue cards arranged by subject³. All of these finding aids share an important concept: they attempt to provide users with a visual representation of an individual image, recognizing that photographs are most likely to find an appropriate audience when handled at the item level and that at some point (sooner rather than later) researchers will need to view the image to determine its suitability not only in terms of content and date, but also in terms of mood, perspective, its visual orientation (either horizontal or vertical), and its ability to convey the editorial message that is often implicit in their use of the photograph.

Each type of traditional finding aid will eventually satisfy these requirements, but their preparation is time-consuming, needs varying levels of mechanical assistance, and offers differing degrees of success in providing reference

copies in response to user demand. The problem, in a nutshell, is to combine a visual representation of the record with its textual description, and to have this finding aid available in a format that allows the identification of relevant information through a wide variety of search criteria including subject, photographer, date, place, and format. This challenge has lain at the core of most programmes dedicated to the improvement of access to the information captured by historical photographs, whether they be planned by large, national cultural institutions, or by much smaller keepers of archives such as the Toronto Harbour Commission.

Throughout the last 80 years, the Commission has relied upon photography to document its impact upon Toronto's waterfront⁴. A succession of talented staff and freelance photographers created well in excess of 45,000 images to document the progress of construction and special events in the life of the port⁵. Traditionally employed by staff to illustrate technical and annual reports, photography has helped to establish a sense of corporate identity and to drive home the wide range of services provided by the Commission. The user group expands considerably when the photographs are transferred from the originating departments to the care of the Archivist. As one might expect, these photographs have attracted a number of people interested in ships and other means of transportation. During the past three years, however, a number of new and significant uses began to emerge that had important ramifications for the Commission's approach to managing photographs.

In the first place, there has been an increasing emphasis placed on exhibit work as the Commission became much more active in efforts to demonstrate its historical involvement with the development of Toronto. Graphic materials such as engineering and architectural drawings, cartographic records and photographs help to convey a sense of the magnitude of the changes that the organization has brought about in the past, and to create a sense of precedent for the Commission's continuing involvement in such unexpected areas as airport management.

Secondly, the preparation of site histories as part of the environmental assessments required by provincial regulations for decommissioning commercial and industrial properties prior to redevelopment has emerged as a new, and perhaps the most significant use for the Commission's historical photographs. After geochemists and environmental engineers exhaust written records, they turn to graphic materials to fill the many gaps and to determine what was where, and how it affected the site. In the face of stringent regulations and growing uncertainty about the environmental legacy of industrial land use, these records can play a crucial role in determining the scale and cost of remediation through careful research.

Finally, there has been a similar concern for the fate of the built environment as expressed through the preparation of heritage assessments⁶. The character of the city and its waterfront has changed dramatically over the last few decades, providing an opportunity for agencies and

developers to create a clean slate for new projects by removing large blocks of Toronto's industrial landscape. It is often difficult to generate the support necessary to save vacant factories, warehouses and storage elevators through the adaptive re-use of these structures, and this process has demonstrated the fragility of industrial heritage at a time when so much of it is disappearing from the evolving economic base of Toronto. Photographic evidence becomes a powerful tool in understanding this process of change, in documenting these developments, and in conveying our interpretation of how industrial land use has affected the human condition to those people who visit the waterfront.

As a result of these relatively recent initiatives, photographs have become the most frequently used component of the Commission's archives. They were also the most difficult element to use efficiently for reasons that are probably representative of the situation confronting most archival repositories that preserve historical photographs. The principal finding aids for photography collections were the registers compiled by their creators. Negatives were listed in chronological order with a brief notation regarding their contents, providing some measure of access for users who had a specific date in mind, or were patient enough to wade through hundreds of pages of lists for a caption that offered a glimmer of relevance. Subject access was provided by an even smaller number of handwritten indices that dealt with no more than 33 per cent of the holdings and were by no means an exhaustive treatment of the records that had been indexed. Perhaps most troubling of all, approximately 30 per cent of the holdings were not listed in any manner or form.

Should a user prevail against these rather daunting odds to compile a list of photographs that merited inspection, still more problems loomed on the horizon. A considerable amount of staff time was spent pulling original prints, photocopying appropriate items for reference purposes, and refiling the prints with the prospect of misfiling always lurking as a distinct possibility. This procedure also posed a threat to the longevity of the photographs due to constant handling. These problems were at least manageable because they involved photographs that survived as prints. On the other hand, thousands of images exist in only a negative format or as transparencies, and they were awkward to inspect and impossible to photocopy, a predicament that restricted the range of materials available to the researcher. In addition, the preparation of photographic reproductions for use in students' papers and theses could be prohibitively expensive from the point of view of the prospective purchaser, thereby limiting the usefulness of the photographic records.

In the face of user needs that were becoming increasingly demanding and time consuming, the Commission began to explore several strategies to improve the management of its historical photographs. Staff toyed with the use of photocopies, but this approach still required a physical arrangement that would facilitate subject access,

and would often involve the use of the original prints to produce additional photocopies in response to users' requests. Contact sheets were also prepared, but they were found to be expensive with many of the limitations inherent in the use of photocopies. Inspired by the use of micrographics at the City of Toronto Archives to make large collections of negatives readily available to the public⁷, the Commission explored the realm of this proven technology. The medium is well suited to browsing and a user can quickly cover a great deal of material in a short period of time, but it has its share of drawbacks. Extended periods of time spent scanning fiche or roll film can be physically unpleasant, while the cost of a computer-assisted retrieval system to locate individual images among processed collections is roughly equivalent to an optical disc work station that entails considerably less eye (and stomach) strain⁸. The quality of copies produced from microfilmed images of continuous-tone photographs also leave much to be desired. While micrographics offer a useful approach to the management of extensive photographic holdings for those institutions blessed with in-house production facilities, recent advances in the practical use of optical disc systems may cause other repositories to pause before investing heavily in this medium.

At roughly the same time that the Commission was investigating these methods to bring images to the user while leaving the original records undisturbed, individual applications using optical disc technology to manage graphic materials began to attract attention. Canadian archivists had been alerted to the potential of optical disc systems for the storage of large amounts of information as early as 1977⁹, but few apparently heeded the call for the profession to become involved in the design and development of this medium as the technology struggled rather unsuccessfully to cope with the expectations of information managers.

Progress in this area was much more rapid during the late 1980s. By the end of the decade, registrants to the International Congress of Archives' symposium on current records, held in Ottawa in May 1989, heard the results of a project that explored the use of optical discs and associated text-management software to store, locate and retrieve large volumes of images held by the National Geographic Society's Illustration Library¹⁰. Visitors were also invited to attend demonstrations of the National Archives of Canada's work with optical disc systems, particularly its efforts with the Canadian Centre for Caricature that led to the digital recording of some 20,000 political cartoons to take the place of the originals when needed for research or copying¹¹. While the numbers of optical disc applications were still rather limited, discussions with representatives of the service bureau involved with the latter project left at least one impressed onlooker with the feeling that an affordable system could be within the reach of a small repository.

Over the course of the next two years, matters slowly developed on two separate fronts. In the first place, the Commission had settled upon a data-base management

software, InMagic, to handle the descriptive process necessary for the preparation of automated inventories. Several factors figured prominently in the Commission's choice of this product: the relative ease it offers for the creation of data structures and report formats; its use of variable-length, repeatable fields; the simplicity of its command language when creating and searching data bases; and most of all, its flexibility in terms of making changes to the structure and contents of data bases, as well as adapting the software to new applications. This last feature would play an important role in the ensuing project.

As this decision was being made, involvement with optical media was being driven primarily by vendor persistence. A number of commercially available turn-key optical disc systems were being marketed in southern Ontario, and one supplier had a particularly attractive product that received lengthy scrutiny. Images were digitized using a flat-bed scanner, described and indexed using a resident text-based retrieval software, and eventually stored on optical disc. The record could then be retrieved to the computer monitor or printed using a standard laser printer to produce a hard-copy output suitable for reference purposes. The scanner, however, presented a serious limitation that was representative of similar commercial systems. This type of hardware is useful only when the record in question is available in a paper-based medium. Close to 50 per cent of the Commission's historical photographs take the form of negatives and transparencies, and the vendor could not accommodate these rather unwieldy formats. It became obvious that if the project was to proceed, the Commission would require a system that could be tailored not only to user needs, but also to the physical characteristics of the medium being recorded. Similar considerations would have an important role to play in the choice between a digital or analog system.

Information recorded in a digital format is considered the more permanent image¹². It is made up of a series of distinct elements that represent either an on or off state. This format accommodates error correction methods that identify and remedy errors in the data that occur as the physical properties of the disc's plastics and glues deteriorate over time. Data can be transferred from disc to disc with practically no loss of information, and it can be manipulated to remove unwanted text or details, to correct exposure, or to introduce other editorial decisions that fundamentally alter the character of the information. If done with sufficient resolution, this type of recording can also be used to produce camera-ready art that virtually eliminates the use of the original photograph for the purposes of research and publication. Exhibits, on the other hand, would still require access to the archival record for the display of historical prints or the production of high-quality modern reproductions.

These benefits do not come without some important concessions in terms of time and space due to the nature of the medium being recorded. Unlike textual records and technical drawings, which usually present information as a basic contrast between dark and light, black and

white continuous-tone photographs can include a tremendous variety of grey tones that must be registered by the scanner and transferred to the storage device. Attempts to capture this range of grey with a resolution sufficient to produce camera-ready copies suitable for publication can consume large amounts of memory. The hardware and software required to create an application that will essentially replace the use of the original record with an electronic facsimile tend to be quite expensive, and can result in a system that will take between 10 and 15 seconds to paint an image on a monitor once the appropriate data has been retrieved and decompressed from its storage device.¹³

The analog format, on the other hand, is composed of a laser-inscribed signal made up of pits, bumps or other types of markings that vary in length according to the frequency. Often referred to as videodiscs, the hardware and image-management software required to drive these storage devices are much cheaper than their digital counterparts. The technology does not involve the compression of large amounts of numeric characters that depict the range of shades within the photograph, resulting in a substantial decrease in the time required to scan an image for storage in an analog system, as well as in the retrieval time (usually within a second or two from a videodisc). The absence of digital encoding that captures the photograph's information is also the format's drawback. Deteriorating discs cannot be treated using corrective software, and hence the recorded information is inherently unstable. As the disc degrades over time, so does the quality of the image. Although manufacturers have been known to suggest that their product will last the better part of a century, the functional life span of information (in terms of the quality of the image, and its resolution in particular) recorded on a disc in an analog signal is approximately 10 years. This last point is very much open to dispute, and can only be resolved through additional testing over time.

While copies can be taken from a master recording throughout its career, subsequent generations will reflect not only the current state of the image (and, in particular, any loss of detail that might have occurred since the date of recording) but also an additional loss of resolution that varies according to a variety of factors involving the processing circuitry, such as the age and condition of the heads on the recording equipment. This secondary loss represents a very small percentage of the recorded information, and it can range from being essentially undetectable to the introduction of a slight blurring of hard edges. Resolution is also affected by the limitations placed by video technology upon the number of lines per screen that can be used for the transmission of information, as well as by the difficulties experienced when the analog signal attempts to portray the passage from clearly defined areas of the image to portions captured with a soft focus.¹⁴

The basic criteria for the Commission's decision to select either an analog or a digital system were the storage and access requirements dictated by the nature of photographs preserved in a wide variety of formats.

Similar projects at the National Archives of Canada have sought to develop applications that will essentially eliminate the use of the original photographs or drawings for reference or reproduction,¹⁵ while others look to optical disc technology to take the place of paper-based records in an attempt to deal with the growing burden of financial information in particular.¹⁶ The Commission, on the other hand, was hoping to achieve a more modest goal: the production of an electronic finding aid that was geared towards research needs rather than conservation or space requirements, although the preservation of the original records would certainly be enhanced by replacing the frequent consultation of historical prints and negatives with access to electronic counterparts. Image manipulation and the ability to produce camera-ready output were not major concerns. In any event, the quality of the hard-copy output of the analog system was acceptable. It would meet the need for reference copies, and could also produce video prints with a surprising clarity suitable for technical reports and students' papers. Original and copy negatives were available close by in the stack area to answer the needs of more demanding orders geared towards exhibits or publications, which were also much more infrequent than the requests for reference copies.

Retrieval time became an important factor, reflecting a trend among users that will have important ramifications for archives and museums. As researchers become increasingly conversant with the abilities of computers to store and process information through exposure to these machines at home and at work, they will have steadily rising expectations of cultural institutions that bring computers into areas of public inquiry.¹⁷ Users who once might have spent an afternoon happily searching through a bank of card catalogues now chaff at the passing seconds as they wait for a computer to spew out the results of its labours. A pause of up to 15 seconds as the software paints an image on a monitor can become quite bothersome, particularly when many users can decide within a second or two if a photograph is pertinent to their inquiries. The problem of improving the retrieval times of digital systems to meet user expectations can be addressed by a subsequent transfer of the data to an analog format. At the Canadian Centre for Caricature operated by the National Archives of Canada, for instance, visitors use such a videodisc produced from the digital recording to achieve greater speed of retrieval.¹⁸ This arrangement combines the best of both technologies, but it is questionable if all institutions can pursue this two-pronged approach.

In the case of the Toronto Harbour Commission, the decision was guided not only by the individual situation, but also by some important comparisons developed by the Ottawa-based service bureau that had carried out successful projects in both analog and digital formats for several departments of the Government of Canada. Working with the Commission's current holdings of some 37,500 historical photographs preserved as prints, negatives and transparencies, conversion time for an analog system would take approximately three months as opposed to between 9 and 12 months for a digital system. Storage re-

quirements differed much more considerably -- only one disc was required for the analog signal, while the digital approach would need approximately 40 discs. The most significant difference, of course, was cost. While a project devoted to a digital application would probably cost in excess of \$200,000, an analog system would cost less than \$70,000 to procure a microcomputer with laser printer to prepare reports from the data base, optical disc hardware (player, video monitor, and two types of printer), and conversion work and data entry by the service bureau at a rate of approximately \$1.00 an image that varied according to the format of the original record.

Needless to say by this point, staff recommended that the Commission pursue a project to store images of its historical photographs on optical disc in an analog format. The report was approved in August 1990 with relatively little debate, but its quick and ready acceptance by senior management and the Board of Commissioners is somewhat difficult to explain. The recent initiatives in terms of exhibits and assessments of industrial heritage and its environmental legacy had certainly raised the profile of the Commission's archives, and had perhaps made management more familiar with the importance of the historical record than they had been in the past. There is also little doubt that photographs represented the most appealing medium within the archival holdings, a type of record that readily attracted the attention and often the affection of those that viewed them. An argument can also be made that innovative projects enhance the image of the sponsoring organization by reinforcing the impression that it knows how to manage effectively its important resources. The system has certainly enhanced the profile of the organization's historical records, replacing the usual connotations of dust and inaccessibility with a bank of fast and responsive technical equipment.

In terms of this individual project, the Commission's Engineering Department had also created something of a precedent only a few months earlier when it won approval for an optical disc system to store its historical and modern technical drawings. This item came in at a figure that was comparable to the monies requested for the archival application, but the estimate represented only hardware and software costs with no funds dedicated to the conversion process. The decision to follow the "low road" of analog to manage the Commission's historical photographs may have created an impression of moderate expectations and reasonable goals, particularly when the preservation of its archives cannot not be seen as the primary operational responsibility of the organization. While large cultural institutions such as the National Archives of Canada can be expected to be in the vanguard of charting new approaches through murky waters, smaller repositories such as the Commission are perhaps better suited to the safe harbour of proven technologies.

After a month spent working out most of the details of the project, the service bureau began ferrying photographs to its Ottawa-based facilities in November 1990. The images were filmed using a 750-line camera that sent the S video signal through a switcher and into the

recorder. Photographic negatives and lantern slides were captured using a light table on a copy stand, while 35 mm slides were converted to the optical disc using a Tamron photo vix. Use of the switcher allowed the service bureau to crop extraneous details, such as framing marks and the copy stand, from around the photograph to ensure that only appropriate information was stored on the optical disc. The switcher also inverted negative images to a positive format. Once the photograph was recorded, it was entered into a data base managed by InMagic using a structure that was limited to the item's reference number, and the disc side and frame number where it could be found. Two very brief report formats were written by the service bureau to drive the optical disc player, answering the hopes of both vendor and customer that an off-the-shelf software with no additional features could be used to manage a rather specific and nontraditional application.

As work continued throughout the winter, pressure was placed on the Commission to finalize the arrangement and numbering of the photographs to ensure the timely processing of the transferred records. The project also revealed some of the incidental characteristics of storage materials that were peculiar to their composition. While polyethylene sleeves might be appropriate for the long-term storage of photographic prints, they proved to be too opaque to allow filming without removing the record from its enclosure. Polyester sleeves, on the other hand, caused no distortion in the image once a polarizing filter had been affixed to the camera, and permitted a higher rate of turnover during filming. Records that had been stored in a numbered polyester sleeve and stored in a box with no secondary enclosures also tended to be processed much faster than photographs that had been received the added protection of archival folders to separate each item. While these processing considerations had no impact on the quoted cost of the conversion, they will be kept in mind as the Commission prepares for future additions to the optical disc in an attempt to reduce the unit costs of the conversion process.

By 20 February 1991, this turn-key system was installed with over 37,500 images stored on a single 12-inch, two-sided Panasonic disc that contains room for an additional 16,500 records. Users of the equipment have been delighted by the resolution and speed of the system, as well as by the quality, convenience and affordability of the output. Surprise has been expressed that the information is actually stored in an analog signal. The installation has met several important objectives of the project, and in particular it has broadened the range of information that can be consulted by both staff and the general public. Large numbers of photographs that were previously unavailable to researchers due to their negative or transparent format are now readily viewed and copied. The beauty and information captured by fragile, hand-coloured lantern slides can be appreciated without handling the original items, and recent acquisitions of 35 mm negatives unaccompanied by prints are examined with ease and without requiring large amounts of imagination and interpretation on the part of the viewer.

The records are certainly more accessible, but the video representation of the photographs did not always turn out as expected. It has taken some adjustment on the part of the user to view a positive image of many photographic negatives because the service bureau chose to capture the item exactly as it appeared during the conversion process, without the kind of intervention that might be expected during printing by a darkroom technician. Overexposed images appear overly bright on the monitor, and underexposed photographs have the opposite effect. While this approach may be slightly annoying to the user who anticipates a crisp and clear image, it provides an accurate representation of the original record that can trigger appropriate instructions to the processing lab if the negative is sent out for printing.

The perimeters of 35 mm negatives, on the other hand, exhibit a bowing effect on screen that will not appear when producing a photographic print. The close proximity of the lens at its macro setting during recording produced the slight distortion in the image, but the final result is not displeasing as it tends to take the shape of the video monitor. The only format that did not copy well were colour negatives, which came out faint and overpowered by the photographs' blue tones. In general, the old computer maxim of "garbage in, garbage out" held true -- the better the quality of the item used in the project, the better the quality of the recorded image. While users might be frustrated by analog's inability to alter or enhance photographic images after they have been stored on the disc to correct exposure or to remove unwanted text or flaws, it actually works as a safeguard in this application, resulting in a finding aid that is a reasonably accurate representation of the original records.

The system has substantially reduced the burden previously placed on the archival holdings by serving as the principal method for the identification and copying of photographic records in response to research inquiries. Instead of being physically handled several times a day as was the norm before the installation of the system, original photographs are now consulted only once or twice a month to verify specific details. Photocopying of original photographs has been virtually replaced by the use of video printers that produce inexpensive output bearing the photograph's archival citation number, which has also eliminated a great deal of uncertainty from subsequent references to these copies. A second report format allows the production of video prints without the citation number for use in unpublished papers and reports.¹⁹

Arrangements for the identification and retrieval of the images within the confines of the system are satisfactory at present, but this aspect of the project offers the greatest room for improvement. The disc can be browsed by staff or researchers when the player has been taken off-line, or staff can use the InMagic data base to target certain collections or individual records identified using the handwritten or typescript indices that existed before the project was begun. Full descriptive cataloguing is proceeding at the item level using a considerably ex-

panded InMagic data structure, but the software will need enhancement in the near future in order to extract the greatest possible benefits from the system.

Under present arrangements, a report format is used to display the visual image by retrieving the appropriate frame after the successful completion of a search using the data base. The optical disc player is driven by a "print" command while in the software's "select" mode, which means that the image on the video monitor cannot be viewed simultaneously with the data base's textual catalogue information; the computer monitor simply reads "next." Researchers wishing to consult the data base's textual description of an individual photograph must discontinue the print run and return to the appropriate item in the search result's queue using the "display" command. At the same time, users who require a printed report of the textual description of their search results must leave the system and enter the DOS environment, where the software's "config" file can be reset to send the appropriate "print" command through the printer port, rather than through the auxiliary or COM 1 port that is used to send commands to the optical disc player.

This arrangement is awkward and requires some dexterity and patience on the part of users, but there is hope for improvement within the near future. A new version of the software is scheduled to be released shortly,²⁰ and it will enable users to hit a key while in "select" that will send the appropriate command to a third-party environment, such as an optical disc player, to display graphic information. This approach, however, is predicated on the assumption that users will continue to follow the traditional route of starting with the textual description of an archival record and then proceed to request the original document, or an image thereof. The Commission's experience with historical photographs suggests otherwise. Users prefer to employ the data base to prepare a general list of images that are selected using rather broad search criteria. They then expect the software to drive the hardware through this list of photographs in a quick and responsive manner as they watch the video monitor, turning to the textual record only when a suitable visual image has caught their eye. This approach requires a default command incorporated into a suitable "display" format so that images will be automatically retrieved and projected on the video monitor for those records that contain information in the "frame" field. Such an arrangement does not exist for this software at the present time, but given the pace of software improvements and the growing awareness of the need to incorporate image-management capabilities within the architecture of text-management software, this goal does not seem impractical or distant.

Ironically, this treatment of archival finding aids is not too far removed from the time-honoured techniques that saw users browse through binders of photocopies or reams of microfilm. Optical disc technology is simply an improvement upon these traditional approaches, but in the case of this application, the image-management capabilities of the software will require enhancement before users handle this technology with the same ease

and comfort that is offered by its predecessors. It will be some time before the system is truly interactive with the general public, and in the meantime the Commission will rely upon staff to serve as intermediaries between the researcher and the hidden mysteries of the disc.

Public programming will have to be developed as these software limitations are overcome, and long-term strategies for this system have not been clearly developed as staff continue to adjust to the implications of a new technology. A number of important issues remain to be addressed in the future: the likely possibility that the number of people wishing to use the system will steadily increase, resulting in the need for parallel access from more than one work station instead of the current arrangements for serial access to the disc; the desire to exchange information with other systems and institutions, which raises the issues of standards and the current inability to share information among different proprietary systems; and the prospect of integrating this videodisc application with other technologies (such as the storage of information in a digital format) that might subsequently be used to capture and store different media, such as text and technical drawings, that do not share the extensive memory requirements of continuous tone photographs. These situations will surely arise during the coming years, but it is equally apparent that optical disc technology will continue to evolve at an accelerating pace and that the responses prepared in five years' time will be substantially different from those developed today. The current availability of equipment that converts analog signals into a digital format offers some hope that the information recently captured by this project can be used in future applications.

In the meantime, there is little doubt that the Commission's experience with optical disc technology has been a success with relatively few qualifications. The historical photographs are resting quietly and comfortably, seldom bothered by the prying hands of staff and researchers. Users are content with a system that can take them through several thousand images in less than an hour, and can generate numbered copies within a few seconds. Staff, meanwhile, are quite happy to have new tools at their disposal to deal with that most vexing of records, the historical photograph. And yet fellow archivists who hear of this project remain coy about the merits of an analog system, assured by their peers in the information management profession that digital is the way of the future. Their reluctance to embark upon similar projects as they wait for some new path along the "high road" may yet prove to be the better way. In the meantime, as the "high road" changes direction with almost every new commercial release of optical media, the Toronto Harbour Commission can only attest to the relative comfort of the "low road." This foray into the use of analog technology has been quick and relatively painless, and the journey has been shared by other cultural institutions facing similar situations.²¹ It has helped to point the way towards a new generation of finding aid for what was, less than a year ago, the most challenging component of the holdings.

ENDNOTES

1. The author would like to acknowledge the generous assistance provided by Philip Sylvain of the National Archives of Canada during the initial planning process of this project, as well as by Christopher Paine of Multi Image Video Productions during its design and implementation. He is also indebted to Karen Teeple of the City of Toronto Archives, Bryan Davis of the Metropolitan Toronto Archives and Records Centre, and Christopher Paine for their critical comments of an earlier draft of this paper. Any remaining heresy represents the author's personal contribution to this work.

2. Under the terms of the incorporating legislation dated 19 May 1911 (Canada, Statutes, 1-2 George V, chapter 26), the organization was given the name of The Toronto Harbour Commissioners. For purposes of convenience, this paper uses the less formal style that has been employed by newspapers and government agencies throughout its history, and will usually refer to the agency as "the Commission".

3. Discussions of these various processes can be found in Robert A. Weinstein and Larry Booth, *Collection, Use, and Care of Historical Photographs* (Nashville: American Association for State and Local History, 1977), pp. 56-58, 116-117; and Mary Lynn Ritzenthaler, Gerald J. Munoff and Margery S. Long, *Archives & Manuscripts: Administration of Photographic Collections* (Chicago: Society of American Archivists, 1984), pp. 91-93.

4. General descriptions of the historical records created and preserved by this organization can be found in the author's articles, "The Toronto Harbour Commission Archives", *Urban History Review/Revue d'histoire urbaine*, 17, no.2 (October 1988), pp. 112-15, and "Toronto's Waterfront at War, 1914-1918", *Archivaria*, 28 (Summer 1989), pp. 126-140.

5. This number reflects the present extent of the holdings. At the time that new approaches to the management of historical photographs were being considered by staff, approximately 37,500 items had been preserved by the Commission. It is expected that the subsequent acquisitions will be added to the system during the current fiscal year.

6. See, for example, Christopher Andreae, *Railway Lands Precinct A, Environmental Report: Heritage* (London, Ont.: Historica Research Limited, 1986); Jeffery Stinson, *The Heritage of the Port Industrial District* (Toronto: Toronto Harbour Commissioners, 1989); and Jeffery Stinson and Michael Moir, *Built Heritage of the East Bayfront, Royal Commission on the Future of the Toronto Waterfront, Technical Paper No.7* (November 1991).

7. R. Scott James, "Microfilming Glass Negatives", *Archivaria*, 5 (Winter 1977-78), pp. 148-150.

8. These remarks are based on the personal experiences of the author, and not upon any objective analysis of the reaction of the general public to the use of microfilmed records.

9. Sam Kula, "Optical Memories: Archival Storage System of the Future, or More Pie in the Sky?", *Archivaria*, 4 (Summer 1977), pp. 43-48.

10. Maura A. Mulvihill, "Visual Data Bases: Photographs as Information Records", in *Management of Recorded Information: Converging Disciplines*, compiled by Cynthia J. Durance (New York: K.G. Saur, 1990), pp. 69-75.

11. Gerald Stone and Philip Sylvain, "ArchiVISTA: A New Horizon in Providing Access to Visual Records of the National Archives of Canada", *Library Trends*, 38, no. 4 (1990), pp. 737-750. This article also provides an interesting overview of the National Archives' various programs to improve access to graphic materials since 1964, including early work with videodiscs between 1978 and 1983 that produced rather discouraging results.

12. The technical details provided in this section are based on an unpublished paper by Philip Sylvain, "Preservation Copying using Optical Disc Technology", 2 June 1989, and on Stone and Sylvain, "ArchiVISTA", pp. 740-741.

13. Compression techniques make digitized information much more manageable. A large engineering drawing requiring some 8 million bytes of memory if stored as scanned can be reduced to some 300,000 bytes by using algorithms that extract unnecessary details and consolidate repetitious information, such as large areas of a constant shade or colour on the drawing. See "The Power of Imaging", *Solutions: The Executive Magazine from Unisys*, 11, no. 5 (November 1990), p. 8. The recent experience of the National Archives of Canada, however, suggests that compression techniques are not currently suitable for the storage of digital images of graphic materials in an archival setting. Magnification of decompressed images revealed "checker-board type patterns" that were inconsistent with the goals of its project; see Stone and Sylvain, "ArchiVISTA", p. 745.

14. The ability of video technology to project only a limited number of lines per screen has led to some contradictory and confusing statistics. For a detailed discussion of this question of resolution, as well as the issue of image definition, see Harry Mathias and Richard Patterson, *Electronic Cinematography: Achieving Photographic Control over the Video Image* (Belmont, Ca.: Wadsworth Publishing Co., 1985), pp. 54-57, 220-223.

15. *Ibid.*, pp. 737-750.

16. "The Power of Imaging", p.6.

17. This situation could well reflect the experience of librarians, who have dealt with the provision of online ac-

cess to automated catalogues for a longer period than their counterparts responsible for the management of historical records. As one consultant recently remarked, "Now that we have shown patrons a glimpse of what we can provide, there is a danger. We have gotten on the express track and can't possibly get off. We must keep running just to keep up". See Susan Baerg Epstein, "Selling Automation to Your Patrons: It's Easier Than You Feared", *Library Journal*, 15 October 1990, p. 63.

18. Stone and Sylvain, "ArchiVISTA", pp. 746-747.

19. A Sony UP-5000 video printer produces colour copies in a 5-inch by 7-inch format on a stable paper base that can be generated in less than 90 seconds for a unit cost to the repository of approximately \$2 before taxes. Although they are by no means comparable to the work of a commercial photography lab, these prints are acceptable for in-house technical reports and would satisfy most public inquiries for a considerably lower sum of money than the amount paid for a photographic print prepared by a service bureau. A Mitsubishi video copy processor generates black and white prints on thermal paper that are less stable and do not contain the same amount of detail as the copies prepared by the Sony printer, but they are prepared at a fraction of the time and cost of the Sony prints and at roughly the same dimensions, and they are generally acceptable to users for reference purposes.

20. See *INMAGIC News*, 7, no. 4 (Winter 1990-91), p. 2 for additional information on this product and its release.

21. The use of videodiscs by the Cleveland Public Library to manage a collection of 55,000 motion-picture still photographs is discussed by Harry Stainer in "Research at flip of a switch", *Cleveland Plain Dealer*, 7 February 1990. This same technology is being implemented at the Avery Architectural and Fine Arts Library of Columbia University to improve access to 45,000 architectural drawings ranging in size from a business card to 10 feet across; see the *Library Journal*, 15 April 1990, p. 16.



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LETTER TO THE EDITOR

From Roy Brown, OakTree Software Specialists
Re: Accession 2.0 reviewed in vol.5#4

You stated that 'there are times when moving backward through a search set that the links can get out of sync'. We have discussed this and realized that the problem is not related to records getting out of sync, but rather a problem with indicating an invalid link. An invalid link occurs when there are no records that meet a search criteria. We are currently using line marks on the upper corners of a window to indicate a dependent link condition. When an invalid link occurs, the last record viewed in the dependent file will continue to be seen, but without any marks to indicate a linked condition. Since the link status is a very important feature when viewing linked records, we will probably upgrade the software in order to indicate the current link status more clearly. We also hope to incorporate other helpful comments in your review in future upgrades to the software.



CALENDAR

May 7-9 Pittsburgh MARAC: "Educating Archivists for the 21st Century" [Richard Cox, SLIS Bldg, University of Pittsburgh, Pittsburgh PA 15260; 412-624-3245] \$40

May 26-29 Madison WI, IASSIST '92 "Data, Networks and Cooperation: Linking Resources in a Distributed World"

May 27-30 Albuquerque NM ASIS Mid-Year: "Telecommunications, Networking and the Networked Information Revolution" [ASIS, 8720 Georgia Ave. Suite 501, Silver Spring MD 20910; fax 301-495-0810] \$175-310

June 1-4 Washington DC, Concurrent Engineering and CALS Conference and Expo [Society for Computer-Aided Engineering, 5411 East State St., Rockford IL 61108-2392; Phone 815-399-8700; fax 815-399-7279]

June 6 Boston, Chicago, San Francisco - National Association for Museum Exhibition Workshops on "Correcting Your Museum's Under-byte: Computers in the Exhibit Process" [NAME Computer Workshop, P.O.Box 876, Bristol, CT 06011-0876; 800-227-0906] \$80. members; \$100 non-members

June 22-25 Anaheim CA Association for Information and Image Management [AIIM, 1100 Wayne Ave., Suite 1100, Silver Spring, MD 20910; fax 301-608-2446]

July 29-31 London Electronic Imaging and the Visual Arts [Brameur Ltd., 237 High St., Aldershot GU11 1TJ England; fax +44 252-22580]



Conference Reports:

Interactive Multimedia in Museums

This video conference from George Washington University was broadcast on January 28 from 1-4 pm. Eastern time. It consisted of three panel sessions, each followed by half an hour of questions from listeners gathered at University and museum sites throughout North America. Teresa LaMaster, Deputy Director of Museum Programs at the Smithsonian did a nice job of moderating all three panels. In the first, Tom Kleiman (National Park Service) presented the use of multiple sound tracks to provide description of images in conjunction with the regular narration in multi-media programs for the blind. Susan Stedman (Museum Education Consortium) discussed and showed the videotape of the MEC prototype art information system developed by Kathy Wilson, and Ray Ashton discussed and played the CD-I products developed for the Museo D'Amparo in Mexico and the Smithsonian Institution. Listeners phoned questions on evaluation of interactive multimedia and its potential impact on audiences and on costs of development.

In the second session William Lynch (GWU), Roberta Binder (IICS) and John Merrill (HiTechplanation) discussed the design and development of multimedia. Lynch emphasized the way museums with limited budgets could still exploit interactive multimedia through use of existing images and sounds and assistance from the community. Binder described the development team and its relations. And Merrill described and showed a multi-media product his firm completed for Walter Reed Army Medical Museum to allow visitors to examine a range of health issues. Questions concerned maintenance, outdoor installations, learning styles of audiences, and the fundamental concept of whether multimedia should be viewed as a way to enhance museum exhibits or as a new mode of experiencing artifacts and hence a new kind of museum in itself.

The third session was intended to discuss the future of interactive multimedia. Rockley Miller (Future Systems and Tech 2000) reviewed the plethora of new technologies emerging in the past twelve months and predicted a divergence between the computer based and home based multimedia in the next few years with compatibility of platforms and intellectual property rights as the major issues confronting museums and other content owners. W.Brewster Merrill (Society of Applied Learning Technologies) discussed the educational implications of multimedia, suggesting that they enabled our return to the individualized attention of a fabled one room school house (most likely a myth). He cited numerous examples of multimedia implementations which produced tested educational results averaging 30% faster learning and 25% greater retention than ordinary instruction.

In the question period which followed the panelists, joined by Susan Stedman, addressed the future of multi-

media databases as research tools, the potential of multi-user environments and philosophical issues about how multimedia experience can be shared in the museum community.

While no three hours on interactive multimedia in museums can be more than an appetizer, this show provided some nice taste treats, an opportunity for open discussion, and some visually tantalizing illustrations of the art. It will serve as a valuable introduction to the uninitiated and the questions posed by remote participants should be especially interesting to those in the know. Questions received during the broadcast revealed that participants from regional institutions gathered in groups at least in Sacramento California, Norfolk Virginia, Houston Texas, Boston Massachusetts, Washington DC, and Pittsburgh Pennsylvania as well as in Manitoba, Ottawa, and Nova Scotia. Audiences in these sites included experienced designers and museum novice, and the opportunity for them to meet locally, and to discuss the issues following the broadcast, was a major secondary benefit. Considering that the per site cost of connecting to the teleconference was only \$350-450, the experience was also an educational bargain for many museum employees who would not have been able to afford a similar conference if they had to travel to it. Sites which received the broadcast had the right to tape it off the air for subsequent viewing, so it may not be too late to "attend" this meeting at those sites. Similar programs are offered on other topics of interest to museums which I hope we would take advantage of as a community since the habit of subscribing to such educational offerings is one which will have to be nurtured before distance learning, or telecommunicated continuing education will realize its potential. [For tapes of this broadcast, and information about upcoming programs in the series, contact: Arlene Polansky, GW Television, 801 22nd. St. NW T306, Washington DC 20052]



Electronic Records of Science

This two day invitational meeting was called to develop a framework for a study of electronic records management issues relating to the longterm retention of scientific records which the National Research Council is proposing to conduct for NARA at NARA's invitation. Shelton Alexander (Pennsylvania State University), the chairman of the meeting, described the purposes of the exercise as being to prepare terms of reference for a more complete study.

The focus of such a study was explained by Trudy Peterson (Assistant Archivist for the National Archives) who noted that NARA was responsible for documenting science because the U.S. Government conducts scientific activity. NARA is charged with preserving evidence of the activity of the Federal government and has no choice but to consider evidence of its scientific activity. At the same time she noted that most of the data about which we would be speaking for the next two days was of informational, as opposed to evidential, value. The problem, as

NARA sees it, is that a very large volume of data could in theory be retained for its informational value and most of this data is today being generated in machine readable form. In the past NARA has required such data to be appraised under a thirty year rule, but it is assumed that after thirty years the electronic records will be difficult if not impossible to either appraise or even use. NARA therefore is asking four questions of the planning group:

Are generic guidelines for appraisal of scientific records conceptually feasible?

Is now the time to develop such guidelines?

What fields of science are ripe for such guidelines and what should be the priorities?

What steps will be necessary in the process of implementing these guidelines?

In the questioning which followed Peterson's presentation, it became clear that most members of the planning group lacked a clear sense of NARA's current endeavors in scientific records and in machine-readable records.

The meeting continued with a series of case studies intended to acquaint members of the planning committee with the range of scientific data archiving activity in several major governmental programs. Richard Davis (NOAA), reported on the work of the National Climate Data Center which was authorized as an agency records center in 1951. NCDC has had a stormy history of relations with NARA which in the past insisted that much of the data which NCDC staff felt should be retained be destroyed. Davis cited punched cards of all pre-1967 hemispheric surface data for which he recently had requests for 1953 data and early upper air observations for which he has had recent requests for data from the period 1900-1905. More recently, NARA has been somewhat more open to longer term retention, although NOAA has only had 4 of the 19 schedules it has tried to negotiate since 1981 approved. Today, U.S. treaty obligations under the terms of the World Meteorological data agreements require NOAA to keep much of this data which is generating 6250 tapes p.a. and is estimated to be 95 terabytes by 1996 and 600 terabytes by the year 2000. The fundamental challenge to NOAA and the scientific community, according to Davis, is to define the degree of resolution required by scientists, especially as the tremendous volume of data results less from scientific requirements than from instrumentation capabilities. What might one have been an hourly observation is now being recorded every second although the metadata hasn't grown at all.

In his commentary on the NCDC case study, Roy Jenne, Director of the National Center for Atmospheric Research underlined the volume dilemma by pointing out that if the Geosynchronous satellite data is retained at 1km/30min., as captured now, it produces 30 Terabytes per year. At the University of Wisconsin, where they currently hold 120TB of such data, simply copying it to new media every 6-8 years requires a continuous, 24 hr a day,

4Mb sec data stream. Decisions about lossless and lossy compression under such circumstances are clearly valuable. Jenne believes the study for NARA could help identify criteria that would be useful to the scientific community in assessing the benefits of such data, especially by identifying instrumentation capabilities that create artifacts which compromise the value of high resolution data.

Thomas Renfrew (Jet Propulsion Laboratory) presented the second case study on the archiving of planetary science data at NASA. Recently, NASA policy has been developed which requires each scientific mission to prepare a data management plan as part of its overall planning and approval process. The data management plans in principle address all the questions about what data should be collected, how it should be analyzed, what should be retained and how what is retained should be disseminated and made available for use by other scientists. However, the National Space Science Data Center, which is the repository for planetary data, holds a great deal of data that was not prepared under the terms of such plans. An experimental project has taken data from one mission, convened peer review groups to assess it, developed technology forecasts which identify in what form the data will best be supported, and defined a distribution format, in this case a CD-ROM with metadata, software to analyze the data and the data set all bundled together. The costs and effort involved in this experimental project convinced Renfrew that an important issue is how to protect the funding for archival treatment of data from operational demands and how to develop mechanisms that can be employed to create quality data sets meeting predefined standards.

In his commentary on the Planetary Data System experiment, Joe King of the National Space Science Data Center stressed the need for project data management plans because experience has shown that the effort to control data after the fact is too expensive. He also noted that continuous data migration is essential and that data needed to be moved from online to near-line over time.

William Kurth (University of Iowa) felt that the project data management plans placed more responsibility of Principal Investigators to prioritize data sets, conduct serious peer reviews of data, update older version of data and catalog data. He even used the term "curation" to describe the preparation of high quality, distributable, data sets.

On the second day of the meeting, Malcolm Chase of the National Institute for Standards and Technology Materials Reference Data Center presented the work of the Standard Reference Data Program which has been in existence since 1963. SRDP produces a very small data base of experimental measurements of very well characterized materials which is copyright and sold. They acquire other data sets and extensively reanalyze them but do not archive these data sets or the distributed databases which have been updated.

Elizabeth Buffum of the Department of Energy Office of Science/Technology Information who commented on the Chase case study, reported that DOE's OSTI operates largely through contracts, and provides abstracting and indexing services for a fee. OSTI considers itself a sort of archive, and many of the scientists in the room also thought of NTIS as a sort of archive, but neither was clear about the extent of its archival mission and both dealt largely with quasi-published reports rather than raw data sets. Kenneth Miynarki of the Bureau of Mines who was responsible for management of materials science data at the Department of the Interior noted that his organization destroys all electronic research data after 5 years and keeps laboratory notebooks in paper form only 10 or 30 years before destruction, while keeping reports permanently. Kurt Malcolm of the Department of Defense, Defense Technical Information Center reported that his repository was also essentially intended for reports and that most of its users probably thought of it as an archive for published materials. An alternative perspective on materials science data was provided by Gil Kaufman a private database distributor who felt that users needed direct access to the numeric data not just to the references.

In the discussion which followed, the group tried to decide how best to preserve the investments made by the U.S. in scientific data acquisition. In general it favored a division of responsibilities and a distribution of data. The data acquisition and retention would be driven by up front, mission based, planning and data pre-processing with peer review following the model of the planetary data systems. It was agreed that data recorded by specific instruments should be processed into integrated databases with adequate contextual and metadata to assure future usability, including future assessment of the meaning of measures, the reliability of instruments and the limits of the data interpretation.

One problem which was recognized by the group is that the degree of consensus on the future value of the data reflects the strength of the governing paradigm but a strong paradigm also limits what data is collected and retained and if overthrown in the future the data that has been kept may be seen as useless. They also acknowledged that observational data is fundamentally different from experimental data because it cannot be repeated and because the entire purpose of the investment made by the government is to capture it. In a discussion of the terms of reference for a study, the group agreed that it must include analysis of the policy framework, consider the appropriate level and locus of responsibility, determine where and how an entity can be the archive of the last resort and when to transfer records, if ever. It determined that seeking models for value added data sets was important and that the results would be to define process guidelines rather than criteria. Finally it decided that the study should explore obligations of contractors, obligations of the U.S. under treaties, and the impact of networks.

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INBOX

Reference

ITEM -Image Technology in European Museums and Art Galleries Database, Issue # 1, January 1991; 113 p., Issue #2, July 1991; 131 p. (Ipswich, UK European Visual Art Information Network, 1991)

These semi-annual volumes are directories consisting of 1-2 page data sheets on known projects, so the second includes entries from the first and the third will supersede the second. EVAIN wants you to subscribe to the online version or the printed version to be sure you will be up to date, but the amount of change between these bi-annual updates is distressingly small. The issues, despite their title, also contain reports from the USA, Japan, Singapore, Australia and other non-European locations which overlap with the updated directory of North American videodisc projects in museums by Roberta Binder, recently published through Future Systems.

Reports

Ann D. Gordon, Report of the Historical Documents Study: Using the Nation's Documentary Heritage (Washington DC, NHPRC & ACLS, 1992)

This study based on 1400 replies from 2000 members of genealogical and historical associations to questions about use of archival and published primary sources is peculiarly biased. Strange assumptions led to the initial construction of the sample, which received a questionnaire with exceptionally leading questions ("Below is a list of conditions that might prevent a person from using historical sources. Please circle..."). Many of its most interesting questions are barely analyzed in the report including a long series which describe the types of subjects being researched. Finally, the discussion is oddly flavored, often seeming to be a defense of documentary editing which the author apparently feels is under attack.

In some places this bias leads to dubious statistics such as adding the proportions of users of NHPRC documentary editions (9%) to those of users of other documentary editions (21%), giving the impression that 30% of respondents used documentary editions when the questionnaire actually asks respondents to list titles they have used in a single question which was then coded by the researchers according to whether users responded with any NHPRC or other edition titles. Apparently if they responded with both they were double counted. [available free from NHPRC (NP) National Archives Building, Washington DC 20408]

National Academy of Public Administration, The Archives of the Future: Archival Strategies for the Treatment of Electronic Databases: A Report for the National Archives and Records Administration (Washington DC, NAPA, Dec. 1991) 40p. plus appendixes

The conclusions of an in depth analysis of more than 900 major governmental database by expert panels brought together by NAPA follow closely those of the advise I offered for records management policy to the UN ACCIS panel. NARA (NAPA recommended) should get active earlier in the life of systems, it should cooperate in the creation of locator/inventory systems, it should take advantage of agency expertise and develop cooperative arrangements with agencies for appraisal, it should develop metadata guidelines consider alternatives to central custody, and address user needs. In addition, specific strategies should be developed now for electronic mail, personal computing, and online database access. Right on. Hopefully NARA will listen better but it has paid for NAPA and NIST studies previously which told it most of the same things and not taken that advise yet.

National Research Council, Commission on Geosciences, Environment and Resources, Committee on Geophysical Data, "Solving the Global Change Puzzle: A U.S. Strategy for Managing Data and Information" (Washington DC, NAS Press, 1991) 52 pp.

This slim document describes the character and volume of information which contributes to the scientific understanding of global change and the challenges of retaining this information over the long term. It advances a strategic proposal for a virtual system, with distributed data and responsibilities, grounded in a national directory of value added metadata, peer reviewed data sets, and enforced principal investigator responsibility as a means for acquiring, documenting and enhancing access to information required to understand long term trends in climate, geophysics, human materials and ecology. The framework, though it may prove to be administratively, is logically quite elegant and stands a better chance of working than any alternatives I know.

Avra Michelson and Jeff Rothenberg, Scholarly Communication, Information Technology, and Archives (Santa Monica, Rand Corporation, 1992)

This report is valuable not only to those who would consider the challenges posed by scholarly communication, but to anyone concerned with the impact of electronic networking and distributed information access on archives. The issues include both the archiving of the communications between individuals and data stores and the archiving of the changing data stores themselves, and in the process Michelson and Rothenberg touch on most of the technical, organizational and conceptual challenges posed by electronic records.

Articles & Books

Monique Attinger, "Integrated Information Management", *The Records & Retrieval Report*, vol.8#1, January 1992 16pp.

Unfortunately, because this issue of RRR addresses a timely and important issue of how to provide multi-system access to data throughout the organization, the author of this report sustains an extended argument for integrated information management without citing any empirical studies or metrics that support her position. She does propose some very general, high level requirements for systems that could integrate information management but these are both too generic to be of much value, and suspect because the author sells software to perform these tasks.

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Philip Borden, "The Future of Multimedia in Exhibit Design", *Exhibit Builder*, Vol.9#4, March/April 1992, p.6-16

A hype-free introduction to why multimedia exhibits are more realistic in 1992 than ever (compression, disk sizes, screens, authoring tools) and how to take advantage of this in the future to create self-updating, compelling and realistic (a little virtual) exhibitions.

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Documents that Move and Speak: Audiovisual Archives in the New Information Age (New York, K.G.Saur, 1992)

These Proceedings of the 1990 Ottawa conference by the same title provide access to a fascinating discussion which opened up, but did not resolve, numerous complex issues in the documentation of multimedia, to a broad audience. The papers, printed here in English or French depending on the language in which they were given, addressed large social issues including the affordability and the cultural propriety of retaining images and sounds, as well as more narrowly technical issues such as how to describe and document these records if they are kept. As a participant, I was impressed by how well the discussions following the papers, held up in summary form and again by the depth of thought in the texts.

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Stephen E. Hannestad, "Clay Tablets to Micro Chips: The Evolution of Archival Practice into the Twenty-First Century", *Library Hi Tech*, vol.9#4, 1991 p.75-96

This article should be preserved on clay tablets as evidence of the degree to which Hannestad is out of touch with archival automation trends and developments. Fortunately for readers only five pages are actually devoted to archival automation, mostly detailing different systems in development and operation at the U.S. National Archives, while the rest of the article is a primer on archival theory and practice as seen from NARA.

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Jean-Pierre Isbouts, "The Digital Renaissance: Of Bagpipes, Boccaccio and Balboa, the story of the production of The Renaissance of Florence", *Instructional Delivery Systems*, January February 1992 p.10-14

This report on the making of the "Great Art" series of CD-I's by the producer of the Van Gogh Revisited videodisk, describes the content and user interface choices made in these packages designed for popular consumption. Users may enter the program by choosing to explore painting, sculpture or architecture shown in the perspective rendered courtyard displayed on the opening screen, to interact with Giorgio Vasari, or to explore the city of Florence through a map interface. Five languages are provided. The editing process, which used the Balboa run-time environment, is described.

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Elli Mylonas, "An Interface to Classical Greek Civilization", *Journal of the American Society for Information Science*, vol.43#2 (March 1992) p.193-201

Not only is this a useful introduction to the strategies used by Project Perseus to organize and present multimedia information on classical Greece, it is useful in the context of several other articles in a special section on user interfaces for the way it defines user-interface issues for multimedia.

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Pamela Samuelson and Robert J. Glushko, "Intellectual Property Rights for Digital Library and Hypertext Publishing Systems: An Analysis of Xanadu", *Hypertext '91: Third ACM Conference on Hypertext Proceedings* (New York, Association of Computing Machinery, 1991) p.39-50

Samuelson and Glushko combine their knowledge of copyright law and of hypermedia engineering issues into a challenging discussion of the ways in which Ted Nelson's Xanadu model does and does not change our paradigms of intellectual property and in the process introduce information relevant to the likelihood of its acceptance.

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Deirdre Stam, "Taming the Beast: Guidance for Administrators on Managing Museum Computerization", *Museum Management and Curatorship*, vol.11 (1992) p.45-60

This is an excellent analytical review of the literature which extracts and presents sound advice on managing the computerization of a museum. I now consider it the best basic introduction to policy, formulating objectives, selecting applications for automation, staffing and project management for senior administrators and expect to use it heavily.

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Newsletters & Journals

Bulletin of the American Society for Information Science, vol 18 #1, October/November 1991 contained a special section, p.8-20, on government information policy with articles by Ed Bridges on state records laws, the NAGARA report on new approaches to management of electronic information systems and a summary of the NHPRC Research Issues in Electronic Records report.

CIDOC Newsletter/Bulletin published by the International Council of Museums will begin volume 3 of its bi-lingual (French and English) newsletter, still without an ISSN number. Nevertheless, the international scope, and depth of the content makes this valuable reading for museum documentation specialists. Available to members of CIDOC, joined by becoming an ICOM affiliate.

Document Management (ISSN 1057-0365) is entering volume 2 with the January/February 1992 issue. Complimentary to professionals involved in the field. For other the fee is \$48 p.a. from Pinnacle Peak Publishing, 8711 Pinnacle Peak Rd., #249 Scottsdale AZ 85255. Recent issues discuss insurance, banking, litigation support applications and such technologies as Computer-Output Laser Disk (COLD). Worth reading if you're planning some scanning.

EDUCOM Review, vol 27#1, January/February 1992 contains numerous articles on multimedia delivery in higher education including Garland Elmore on integrating a portable multimedia workstation for classroom delivery, Fred Hofstetter on institutional support requirements, Geraldine Gay on collaboration in design, and Gene Sherron on document imaging systems capabilities and the costs and benefits of implementing them.

Exhibitionist, the Newsletter of the National Association for Museum Exhibition (NAME) continues to carry interesting articles and useful reviews of publications. Membership in NAME is still only \$15 a year to AAM members. Contact Louise DeMars, POB 876, Bristol, CT 06011.

Impact Assessment Bulletin (ISSN 0734-9165) vol.9 #1/2 (1991) is a special issue on hypermedia containing a large number of very useful articles. I mention it here because it is such an unusual place to find them.

Ephemera

Archives Library Information Center, **Barcodes: A Selective Bibliography and Moving: A Selective Bibliography**, both published February 1992 (National Archives, Washington DC 20408, free)

These two bibliographies answer a need that I'm often asked to satisfy for case studies of the use of bar-codes in archives and museums collections management and on techniques for facilitating large scale collection moves. The title indexes aren't as good as a subject index, but the lists are relatively short so dive in. Some details of these studies will reveal ways of doing it right - and wrong!

Art & Architecture Thesaurus Bulletin #19, 1991 [AAT, Getty Art History Information Program, 62 Stratton Rd, Williamstown, MA 01267; 413-458-2151]

This unfortunately ephemeral document contains some of the most interesting and suggestive articles on the use of language to index and retrieve images that have ever appeared in print. Read Helene Roberts on using the AAT as a classification aid, Maryly Snow on the implementation of an AAT browser in windows mode to assist in term assignment, Mary Daniels on the problem of assigning AAT terms to artifacts, archives, photographs, and drawings, Vicki Porter on cataloging architectural drawings following the proposals of the Architectural Drawings Advisory Group which tried to combine indexing and description, and Merrill Smith on the experience of the MIT Rotch Library in assigning AAT terms to architectural photographs. Each case study testifies to the complexity of the issues involved and demonstrates how small choices of technique contribute to or detract from usability.

Richard Dougherty and Carol Hughes, **Preferred Futures for Libraries: A Summary of Six Workshops with University Provosts and Library Directors** (Mountain View CA, Research Libraries Group, 1991) 19pp.

Library directors envision the universal workstation environment tying virtual libraries to the community of scholars and consider how best to achieve these objectives in a period of limited resources.

Guidelines for Arrangement and Description of Archives and Manuscripts: A Manual for the Historical Records Programs in New York State (NY State Archives and Records Administration, Albany NY 12230) 1991, 35pp.

This is a short, clear, nicely laid out and well presented summary of the current practice of archival arrangement and description and of how the use of these practices to create a statewide online catalog of archival resources (TRAILS) and be consistent with national standards.

INTELLECTUAL PROPERTY & MULTIMEDIA

The Interactive Multimedia Association (IMA) has launched an initiative to address the intellectual property problems that inhibit the development of a broad marketplace for multimedia products and services. The problems to be addressed include:

- » lack of security and threat of uncontrolled reuse
- » lack of standards for encryption, encoding and authorization
- » lack of accepted licensing models
- » lack of common definitions
- » difficulty in locating and accessing content
- » difficulty in determining scope and ownership of needed rights
- » difficulty of anticipating technological environment uncertain scope of the market
- » lack of established market structures and mechanisms
- » developers do not understand customs of content markets
- » developers do not understand concerns of content owners
- » uncertainty with respect to fair use
- » uncertainty with respect to adaptation rights
- » uncertainty concerning other intellectual property rights
- » difficulty of establishing enforceable end-user contracts
- » divergent expectations concerning pricing and value

Five task groups of the Task Force are being established to address these issues under the headings of: Licensing Paradigms and Strategies Technical Safeguards Publishing and Library Systems Collectives Legal and Policy Issues [for further information, contact: Brian Kahin, Chair IMA Task Force on Intellectual Property, 1 Fifth St., Cambridge MA 02141; 617-864-6606; fax 617-864-0610]

BRANCUSI PROJECT

Ecaterina Geber, Coordinator of Systems Development at the Information Center for Culture & Heritage in Bucharest has sent a lengthy update (January 1992) on the Brancusi interactive multimedia project coordinated by the European Visual Arts Information Network in Ipswich UK and the Romanian Ministry of Culture. The objective is to produce a multilingual, multimedia, resource on the life and work of Brancusi through international collaboration among museums holding his works and to publish the result on CD's. The project is currently funded only through the first phase, to create a "demonstrator" with a sampling of material and an introduction to the approach. Organizations in Romania, France, the USA and UK are currently involved. [for further information contact Jeremy Rees, EVAIN, c/o European Visual Arts Centre at Ipswich, The Library, Suffolk College, Rope Walk, Ipswich, Suffolk IP4 1LT, UK; +44-473-211214; fax +44-473-230054]

CENSUS OF ANTIQUE ART AND ARCHITECTURE

A database of approximately 45,000 records representing works of art and images of works of arts from the classical world that were known in the Renaissance has been completed and made publicly available at the three cooperating institutions: the Warburg Institute (London), the Bibliotheca Hertziana (Rome) and the Getty AHIP (Santa Monica USA). The dual screen system enables users to compare a photograph of an ancient monument with a depiction of it in a Renaissance drawing and to see texts together with transcriptions of them. [for more information, contact Michael Ester, Director, Getty AHIP, 401 Wilshire Blvd., Suite 1100, Santa Monica, CA 90401-1455; 213-395-1025]

RESEARCH LIBRARIES GROUP GRANTS

The Research Libraries Group [1200 Villa St., Mountain View, CA 94041-1100; 415-962-9951] has received \$750,000 from the William & Flora Hewlett Foundation to support new initiatives including the development of a local system serving archives, museums and related repositories. It also received a grant of \$906,224 from the NEH to support the third phase of a project to microfilm almost 12,000 brittle or deteriorating volumes from scholarly collections in the U.S.. RLG also announced cooperative agreements with Retro Link Associates to provide RLG databases to RLA for retrospective conversions and with UMI/Data Courier to deliver Periodical Abstracts, Newspaper Abstracts and Dissertation Abstracts to RLG members for a fixed annual fee.

MULTIMEDIA AT LC

The Library of Congress recently appointed Robert Dierker, previously of the Smithsonian Office of Telecommunications, as senior advisor for multimedia activities in the Office of the Librarian. In addition, it opened the National Demonstration Laboratory for Interactive Technology, under the direction of Jacqueline Hess. The Lab and Ms. Hess were also previously at the Smithsonian. For more on the Lab and its purposes, see LC Information Bulletin, February 24, 1992 p.73-76.

GTE IMAGE SPAN TAKES ON ARCHIVES AND MUSEUMS

GTE ImageSpan [One Stamford Forum, Stamford CT 06904; 203-965-3533] is working with the Library of Congress on transmission of its software based collections as reported in the LC Information Bulletin. It is also demonstrating the potential of museum to museum real-time video links with the National Gallery of Art (Washington), the Victoria and Albert Museum and the Louvre on an online link between exhibits of ceramics being simultaneously opened at each site. GTE ImageSpan has also agreed to be the commercial sponsor of the International Conference on Hypermedia and Interactivity in Museums (ICHIM '93), to be held in Cambridge England, September 20-24, 1993. □

THE ICA PRINCIPLES REGARDING ARCHIVAL DESCRIPTION

by David Bearman

In January 1992, the International Council on Archives Ad Hoc Commission on Descriptive Standards approved the first revised version of its Statement of Principles Regarding Archival Description (*Principles*) and a draft General International Standard Archival Description: ISAD(G). These documents are being circulated in advance of the September ICA meetings in Montreal where the Commission will submit them for approval as standards.

The *Principles* reflect a records-oriented, descriptive cataloging tradition, as opposed to the context-oriented, life cycle data management approach which I have advocated. In this respect I find them seriously wanting and have offered an alternative set of principles in an article entitled "Documenting Documentation" to be published in *Archivaria* in the fall. Here, however, I will examine the ICA Principles in themselves.

The glossary of the *Principles* defines archival description as the:

"creation of an accurate representation of the fonds and its component parts by the process of capturing, collating, analyzing and organizing any information that serves to identify archival material and explain the context and record systems which produced it".

In practice, however, the Commission "has focused its attention on one particular aspect of archival description for the purpose of the Principles, namely the description which serves, as far as possible, as the definitive representation of the archival material and which is required to establish intellectual control over it and promote access to the information it contains. This means that the Commission has taken its stand at a point after the archival material has been selected for permanent preservation and arranged."

Thus for the ICA Commission description not only takes place after accessioning, is less a verb in most uses than a noun equivalent to "collection surrogate". The object of such archival descriptions is a "unit of description" defined in the glossary, rather unhelpfully as "any archival entity being described", but which in the *Principles* themselves clearly is, in the first instance, the fonds. The Commission asserts that the "broadest unit of description is the fonds"(2.2), and assumes that it follows from this that the fonds is the appropriate base unit for archival description. In making the fonds the focus, the *Principles* follow North American practice but ignore the fruitful Australian experience and some North American work influenced by it

which makes series the focus of archival attention because series reflect the conjunction of the context of the activity and the information system in the records creating organization.

Even if we were to treat the fonds as primary, and the Commission recognizes that doing so is far from clear cut (2.2.1-2.2.3), it doesn't necessarily follow that the primary source of information for description should be the records themselves. The *Principles* state that information for the description of the whole is obtained and compiled from analysis of the parts (3.1), ignoring the importance of structured recording of information about people, organizations, events, activities, and functions which comprise the context of record creation. The structured information they do acknowledge, which they call "authority data", is defined by the Commission as nothing more than "standardized forms of terms including names (personal, corporate, or geographic) used as access points together with some other relevant information associated with the terms, such as the source of a name, the relationship with other terms, etc". In other words, the sum of structured representation of the contexts of creation of the records is a list of headings and their semantic links with no documentation of the actual life history, activity, purposes and methods of the actors in the real world whose actions created records. The *Principles* thus fall short of documenting what is necessary about provenance or taking advantage of contextually generated sources of information.

The *Principles* also imply specific implementations, an arena more appropriately left to rules for how to produce descriptions for those settings. What can we say about the assertion that "each description, regardless of level, is composed on an ordered set of elements"(4.1), except to assume that the term ordered implies a specific output product or printed description? How are we to read the assertion "that a full developed system of archival description should include controlled vocabulary for retrieval purposes" 5.4) except as a prescription for a concrete information retrieval implementation?

The draft rules contained in ISAD(G) are also confused about their focus and not clear about their relationship to the *Principles*. Where we would expect rules to get specific, for example in the definition of acceptable data values or representations, we find nothing, in spite of assertions within the *Principles* that they are intended to guide data representation. For example, the *Principles* state that "an important means of providing for retrieval of provenance and other elements of description is the creation of access points which should be subject to authority control"(5.3), but ISAD(G) buries what the glossary calls provenance (the name of the creator) in the middle of a title statement where it is neither likely to be an access point nor meaningfully subject to authority control. The intellectual content is relegated to a prose scope and content note and no recognition of the function or activity generating the data is provided at all.

The introduction to ISAD(G), which concerns "multi-level description" certainly provides rules for one particular implementation but seems to be asserting that these are general guidelines for archival description systems. It envisions a manual finding aid systems of archival description products which it never describes in advising that "the fonds as a whole should be represented in one description" (1.1), "present the resulting descriptions in a hierarchical part-to-whole relationship proceeding from the broadest (fonds) to the more specific"(2.1), and "provide only such information as is appropriate to the level being described"(2.2). It hints that the implementation for which these descriptions are being constructed is automated because manual systems cannot "link each description to its next higher unit of description" (2.3) but only with descriptions below it. It also recommends that "at the highest appropriate level give information that is common to the component parts"(2.4) without suggesting how such inheritance of characteristics is expected to work. It certainly can't be read a generic advice since the functionality is missing from a manual environment unless we want to attribute it to an archival inventory that is read end to end.

In the body of the standard, the Commission proposes five areas of data. The first of these, the "Identity Statement Area" is fairly traditional, but in reading the document as rules for data representation, which is its stated purpose, one realizes that it is also very peculiar. For example, the first element of information is the identification of both the repository and fonds in a single field! This is followed by a title which may be transcribed but is usually constructed by the archivist. If constructed, the instructions call for the first element of the title to be what the Commission calls "form" but the examples and glossary make evident is format of the material (3.1.2). This is unfortunate since the actual, culturally significant form of material could be a useful retrieval point. This is followed by the date (3.1.3), "level of the unit of description", and quantity. While the "level" is an important idea to ISAD(G) it has different values in the diagram used to illustrate the concept for readers than in this section of the standard. The overall illustration of the title is provided by three examples each of which employs different methods of data representation. Here again the rules reveal the confusion of the Commission as to whether it is defining an output product or the data dictionary of an archival descriptive system. By constructing a title composed of elements many of which should be searchable and which require quite different search and manipulation capabilities (a thesaurus of form, an organization chart of provenance, a subject-like vocabulary consisting of "a phrase reflecting function, activity, subject, location or theme", the Commission leaves a reader in serious doubt about the rules as generally applicable guidelines.

The second area is entitled "Context and Content Area". It serves as a place to report information regarding the history of the records which effect their content, but tells us little of use about context. The first element of information "administrative/ biographical history" is said to be provided "to place the material in context and make it

better understood" but the rule asks us to "record concisely any significant information on the origin, progress, development and work of the organization or on the life and work of the individual responsible for the creation of the unit of description" and the examples show disappointingly general prose paragraphs about the life of the person or institution, without reference to aspects of that history particularly relevant to the creation of these particular records, is recorded.

The section does, however, include some useful, and somewhat unusual, elements: the dates of accumulation of the unit, its custodial history, the immediate source of acquisition, its legal status, appraisal destruction and scheduling information, on accruals, and a note on the system of arrangement. Unfortunately the Commission ignores the fact that all this data could be acquired during the life of the records prior to "description", and that failure to specify how the data should be recorded earlier in the life-cycle of the materials will result in redundant work at the "description" stage. A final field of information, the usual scope and content note, once again represents data in an undifferentiated prose field, in a manner which cannot be easily retrieved, contrary to the *Principles*.

The third area, "Conditions of Access and Use" includes language, physical characteristics, access conditions, use conditions and information on the availability of finding aids. The section misses an opportunity to provide guidance on how to make these conditions congruent with archival repository policy on access and use and with relevant national law or repository policy on conditions for reproduction, publication, dissemination etc. so that these terms could be exploited in the management of the records. It also fails to structure the physical characteristics data in a way that could contribute to material management.

The fourth area entitled "Allied Materials" allows for documentation of the location of originals, copies, related united, associated units, and published discussions. The fifth, in an enormous cop-out, consists of a single element called "Note" which covers anything not previously included.

By loosely following these *Principles* and rules, one could create a conceptually viable international union catalog of archival materials. It would require greater specificity to derive a workable system given the lack of data value definitions of the interchange record and the absence of a service profile. One certainly could not use these rules, however, to construct a viable system for archival management of records in creating organizations or in archival repositories. Nor could we use them to describe records for the purpose of remote delivery of documents, or seeking expert consultancies on conservation methods, or sharing reformatting service bureaus, or numerous other reasonable service profiles of future archival information networks. The point is that the *Principles* aren't principles and the term "General" in ISAD(G) is inappropriate unless it refers to the generality of the resulting description.

SYSTEMS

HARDWARE

JVC Information Products Company [Jack Moran, Sub-Systems Sales, 19900 Beach Blvd. Suite 1, Huntington Beach, CA 92648; fax 714-968-9071] is shipping Personal ROMMaker a form-driven, PC-based system for outputting ISO 9660 formatted CD-ROM onto 4mm DAT tape or CD-WORM drives with virtual emulation quality control software. The full system with 1GB DAT tape drives sells at c.\$7,000; with the WORM drives at \$12,000 through value added resellers and dealers.

Museum Technology Source [20 Bacon St., P.O.Box 306, Winchester MA 018980; 1-800-729-6873] has introduced a new series of audio and videodisc controllers for exhibition installations.

RGB Spectrum [950 Marina Village Parkway, Alameda CA 94501; 510-848-0180, fax. 510-848-0971] demonstrated its "MediaWall" computer graphics display at Intercomm in January and the AAM in May. The system provides for digital and analog display and the use of industry standards software for multimedia presentations on a stackable array of RGB monitors. The wall may be treated as a projection screen, or in a tiled mode an incredibly high resolution of up to 3200x2400 pixels can be displayed. The system supports splits, zooms, pans, pushes, wipes, snakes, shrinks, fades and computer overlays.

SERVICES

Avedon Associates [14 Accord Court, Potomac MD 20854; fax 301-983-0113] has published the 1992 International Imaging Source Book covering 230 companies providing hardware and software as well as conversion and value-added reselling services. 436pp. \$100 in US and Canada; \$120 overseas.

The Program for Art on Film, a joint venture of the Metropolitan Museum of Art and the J.Paul Getty Trust, [980 Madison Ave., New York, NY 10021; fax 212-628-8963] is offering low initial enrollment fees of \$30 for individuals and educational institutions, and \$65 for commercial and governmental organizations to its 17,000 record online database. First searches are free; subsequent searches are \$20 or \$40 depending on membership category and include the cost of postage of paper copies of search results. The database contains textual records with the addresses of distribution sources for each film, citations to reviews and awards and basic filmographic data including a synopsis.

SOFTWARE

Business Simulations Ltd. [30 St. James St., London SW1A 1HB; +71-925-0636; fax +71-925-0638] has added products to either side of its successful Cardbox-Plus information retrieval software. Picture Cardbox holds images in Targa, PCX or GIF formats and Term Manager supports construction and use of a thesaurus in conjunction with Cardbox-Plus data entry and retrieval. An interesting aspect of the imagebase product is that all the images are stored, compressed, in a single file. The system runs on very low end PC's (256KB) and a VGA display without any additional hardware or adapter cards.

Chadwyck-Healey Inc. [1101 King St., Alexandria VA 22314; fax 703-683-7589] has published the Museum of Modern Art Artist Files of over 200,000 items on 5200 microfiche with a machine-readable index of over 20,000 names (\$29,500). The list complements the New York Public Library Artist Files (1.5 million items on 76,000 artists; \$26,000) and NYPL Print files (printmakers, illustrators & photographers; \$15,600) published by C-H previously.

Coastal Technologies [615 Valley Rd., Upper Montclair NJ 07043; 201-744-3338] has developed "Landmark Planner", a software package built in Clipper to support all aspects of collection and site maintenance and planning. The Coastal software will be made available to museums through a contract with the Chubb Group of Insurance Companies [Warren, NJ 07059; 800-54CHUBB]. Chubb, which calls the package CHUB-BMUSE, plans to begin giving the software away to organizations it insures when a final version is completed in June, as part of a risk management program involving item documentation, condition reporting, preventive maintenance, disaster planning and off-site data storage.

ECHO Consulting Services [P.O.Box 540 Main St., Center Conway, NH 03813; 800-635-8209, fax 603-447-2037] has released a major upgrade (3.5) of the ECHO Development System with improved documentation including on-line help, expanded donor information and improved reporting facilities. ECHO also offers four integrated accounting modules (General Ledger, Accounts Payable, Payroll and Quick Receivables), also written in Clipper for DOS systems and Novell networks.

Innovative Interfaces [2344 Sixth St., Berkeley CA 94710; 800-444-2344] is known as a library systems provider, but its new "Art Reference Database" interface to the National Gallery of Art videodisc, which provides dual screen displays from artist, title, keyword, style and medium searches can be generalized to support image access to local videodisc imagebases.

Katz/Ames Software [1624 Spruce St., #4, Philadelphia PA 19103; 215-545-4360] has released Museum Monitors, a software program to help museum managers, trustees, creditors and donors measure museum achievements. Based on performance ratios developed by Peter Ames in his capacity as Special Assistant to the President of the Boston Museum of Science, the indicators measure such ratios as capacity utilization, low income accessibility, staff contributions to the profession, and marketing efficiency and permit managers to compare their institution with target ranges established by Ames. The current version of Museum Monitors, which contains about half the measures developed by Ames, runs on a Macintosh and retails for \$150.

Magnetic Reports [496-A Hudson St. (Dept. X-6), New York NY 10014; 212-243-4132] is selling the Catalogue Raisonne Software System (CRSS), a Fox-base/TurboPascal program for creating an exhibition catalog, catalogue raisonne, or collection inventory of art works. The system consists of four primary files: works, provenance, exhibitions and bibliography. Functions are essentially data entry, retrieval and printing of the catalogs.

MIS Software Development Inc. [1349 Cross Creek Way, Tallahassee FL 32301; 904-878-3096; fax 904-877-1771] has released version 2.01 of its Archives Integrated Information Management System (AIIMS) which was first developed for the Florida State Archives. The system includes collection description (MARC compatible with OCLC export function) with agency control, patron registration, action tracking and collection usage reporting. Single user versions are priced at \$4500; five users at \$8500, including installation and training.

OMNIBUS, developed by Clinton Richmond [423 Washington St., Brookline MA, 02146-6127; 617-739-7978] is being used by non-profits in Massachusetts to create media libraries, archives and museums and in educational projects such as hyperbooks and exhibits. At the Tsongas Industrial History Center in Lowell, OMNIBUS was used to develop an educational tool for school groups called "The Industrial City" which teaches students to use primary materials, including maps, photographs and raw data in research. In the North Adams Project, OMNIBUS is the basis for an interactive exhibit using about 5000 pages of material from 15 distinct collections. Richmond is interested in having non-profits adapt the hypercard based system for local uses and data sharing.

Paciolan Systems [2875 Temple Ave., Long Beach, CA 90806; 310-595-1092; fax 310-595-7900] offers a number of software modules to manage and enhance income, including a complete accounting package (general ledger, budget control and forecasting, accounts payable, purchasing, accounts receivable, payroll and fixed assets) as

well as packages for ticket reservation, membership, development, inventory and retail sales, and events scheduling. The firm, which has been in business since 1980 and is widely installed in the higher education market has recently formed a strategic marketing alliance with Questor Systems. Like Questor, Paciolan migrated from Pick to Unix in the recent past and supports a variety of platforms. Data can be moved between applications, with all financial data reported to the General Ledger. Paciolan is working on a full resource scheduling application and on group tours.

2b Technology Inc. [One North 5th St., Suite 300; Richmond VA 23219; 804-344-8464; fax 804-344-8549] has released Vista, a group reservation and resource scheduling system written in DataFlex and the FlexQL report writer for IBM compatibles. Vista was developed for Jamestown Plantations and was been implemented in two other museums before making its commercial debut in April. It maintains data on tour operators or schools and on tour groups or classes, allows the museum to define programs and their pricing, the resources they require (personnel, facilities, equipment etc.), and to maintain resource schedules. The system also allows museums to capture and analyze visitor information, including demographics which can be compared with general market data, and to prepare the reports and correspondence required in public programming functions.

Slideware [P.O.Box 194; Sausalito, CA 94966; 707-942-5167] was at the VRA meeting with a list of more than 30 clients who have installed its Visual Resources Management System (VRMS) software since it first became available in 1985. This electronic card catalog for slides, with its slide labeling features, is still planning multi-user access, AAT based authority control and barcoded circulation.

Visual Information Inc. [600 17th St., Suite 415, Denver CO 80202; 303-892-0304] has introduced ImageBASE, an image capture, indexing, searching and reproduction ordering system which it is selling with the highly unusual condition that it owns the digital marketing rights to images captured in ImageBASE. It will be interesting to see if this gets any takers.

COMPUTER WORKPLACE ERGONOMICS

An useful summary of the research findings on computer workplace ergonomics, reprinted from a publication by Clifford Gross and Charles Hessel, is available free from Action Computer Supplies, 1-800-822-3132.

STANDARDS

CIMI COMPARES ISO 2709, SGML and ASN.1

Staff and volunteers working with the Committee on Computer Interchange of Museum Information (CIMI) completed an analysis of the three options for interchange of museum collections catalog and reference databases requested by the Committee at its fall 1991 meeting. The document (42pp.) includes discussions of the suitability of ISO 2709 (the parent of the MARC formats), Standard Generalized Markup Language (SGML) and Abstract Syntax Notation 1 (ASN.1) as well as samples of several records containing data provided by the National Gallery of Canada together with images of the items they represent in each format. The committee decision document demonstrates that each of the protocols was able to convey the records and images, but in the answers to a series of questions concerning each discussion that accompanies each protocol differences were exposed whose significance the Committee debated at its meeting on April 21-23. While CIMI did not endorse any one of the three approaches, its discussions prepared the way for choices in how to map concrete data and service requirements being developed by its museum community task groups in the coming year. [for copies of this and other CIMI background papers and to participate in the development of formats for museum data interchange once selection of protocol options is completed, contact John Perkins, Project Manager, 5659 Merkel St., Halifax NS B3K 2J1, CANADA; 902-454-4077; fax 902-453-6153]



NISO DRAFT PATRON REGISTRATION DATA Z39.69-199x

The National Information Standards Organization has been circulating a draft standard for patron registration data. As would be expected the terminology in the data element naming reflects library practices, but the general framework probably would suit any patron registration database. Unfortunately the developers did not envision the registration data as part of a full client database, so the record lacks a "role" (= registered user) field and specific ways of representing other organizational relations of the user but it will nevertheless do for most archives and museums. [for further information contact NISO, P.O.Box 1056 Bethesda MD 20827; 301-975-2814]



OPEN EDI

In a paper presented to the World EDI Forum in Brussels in September, Jake Knoppers of CANAGLOBE International suggested a model for "Open-edi" development of future EDI which included criteria for assessing if an interchange was suitable to EDI. These were that the transaction involves "commitment" (pre-defined states of agreement regarding obligations) and that the roles of the agents are "rule-based", "automated", invoke defined "states of the parties" to the transaction, require

"autonomy of the parties" and permit the parties to engage in "multiple simultaneous transactions". These six criteria along with a definition of a generic business operation led to the definition of "Open edi" as: "electronic data interchange among autonomous parties using public and non-proprietary standards aiming towards global interoperability over time, business sectors, information technology systems and data types" While the determination of "what the business and organizational requirements are (or should be) is outside the model" the paper suggests a method of "Business Scenario Modeling" which proved useful to CIMI in identifying areas of museum data interchange likely to be served by EDI. [contact Canaglobe International Inc., 154 Slater St., Suite #2, Ottawa K1P 5H6; fax 613-234-3935]



INTERNATIONAL MUSEUM and CULTURAL HERITAGE DOCUMENTATION

Representatives of numerous international museum standards and documentation initiatives took part in a meeting in Canterbury UK, September 7-8 1991 under the auspices of the International Council of Museums Documentation Committee (CIDOC) and the J. Paul Getty Trust Art History Information Program (AHIP). The meeting provided an opportunity for coordination between efforts of CIDOC, including its working groups on Reconciliation of Standards, Documentation Standards and Terminology Control, AHIP, ICOM, the ICOM Committee for Musical Instruments, Council of Europe Cultural Heritage Commission, the European Commission DGX Cultural Action Unit, the Council of Europe Cultural Heritage Committee, the Network of Art Research Computer Image Systems in Europe (NARCISSE), the Museum Documentation Association (MDA), the Canadian Heritage Information Network (CHIN), the Romanian Center for Culture and Heritage, CNUCE and the Italian Institute for Cataloging and Documentation, and the Committee on Computer Interchange of Museum Information (CIMI). The meeting also resulted in the preparation of a reference report "Museum and Cultural Information Standards: International Developments" which summarizes efforts worldwide. [for more information contact Andrew Roberts, Chair CIDOC, 53 Shelford Rd., Cambridge CB2 2LZ, UK; fax +44-223-842136, or Eleanor Fink, Getty AHIP, 401 Wilshire Blvd., Santa Monica CA 90401 USA; fax 310-451-5570]



CONCISE GUIDE TO US MARC FORMATS UPDATE

The first complete update to the Concise Guide to US Marc Formats first issued in 1988 has been published. It includes content designation for the New MARC Format for Classification Data as well as the latest versions of the format for Bibliographic Data, Authority Data and Holdings Data. [Contact Library of Congress, Customer Services Section CDS, Washington DC 20541-5017; fax 202-707-1334; \$28 in North America; \$30 overseas].