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Jim Suderman Case study leader

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A. Case Study Overview and Conclusions

Overview

The Archives of Ontario's case study on Web exhibits was approved by the InterPARES 2 International Team at their meeting in June, 2002. The case study was proposed and led by Jim Suderman. The study team was comprised of Marta Braun (Ryerson U), Barbara Craig (U of Toronto), Terra Dickson (U of British Columbia), and Michael Murphy (Ryerson U). Invaluable assistance was provided by Deidre Brocklehurst in transcribing the recorded interviews and providing initial analysis of them, and by Peggy Heger, in completing a survey of relevant literature

The case study is in the process of examining the creation and posting of institutional Web exhibits within the operational contexts of two publicly funded archival institutions. Subjects from both institutions were interviewed. From the larger institution, subjects were selected for their relationship with the following three Web exhibits:

- 1 The Government of Ontario Art Collection,
- 2. Toys of our Childhood [Eaton's Christmas toy exhibit], and
- 3. The War of 1812.¹

The Archives of Ontario's mandate includes enhancing access to its "rich and varied holdings via the internet." To this end, the Archives' 2000-2003 strategic plan identifies the development and implementation of tools to communicate and promote its holdings as a key strategy. To fulfil this strategy, the Archives has and continues to develop Web exhibits. These exhibits are open to anyone able to access the Archives' Web site.²

The exhibits are created by archivists, support staff and the Archives' Web site Coordinator; they are approved by management before they are placed on the Web site. The exhibits are created from scanned images, recorded sound, and text files-all combined into Web pages using HTML and accessed using Web browser applications. The process of creation involves decisions by Archives' staff on the subject of the exhibit, on the choice of records used to include in the exhibit, and on how to present the chosen records. To date, maintenance of the exhibits primarily involves making revisions to them. The records that are the subject of this case study are primarily the final format of the exhibit records, and secondarily the records created and used during the actual creation of the Web exhibit. The records created to support the development and maintenance of a Web exhibit can include conventional records such as meeting minutes, retrieval request slips, etc.

The records generated in the development of Web exhibits, from conception to posting, at the Archives of Ontario are of interest to the InterPARES 2 project because they correspond to the fundamental criteria formulated for accepting case studies: 1) that the case study fit within one focus (artistic, scientific, or governmental); 2) that the case study examine a class of records and

¹ Note that two of these exhibits are not those originally proposed. The "War of 1812" exhibit was introduced as it was a work in progress. This would give the study currency and would rely less on memory. The "Toys" exhibit replaced the other Eaton's exhibit because it had greater appeal to the study group. These changes were not seen as altering in any substantive sense the scope and relevance of the approved case study proposal. ² See http://www.archives.gov.on.ca/english/index.html.

a type of records creation which are not unique but of a kind likely to be repeated in other circumstances; and 3) that the case study examine dynamic, interactive, or experiential records.³

The process by which exhibits are created may provide indicators of authenticity, accuracy and reliability in experiential and interactive records.

Summary of Conclusions

The following summary of conclusions or tentative findings of the case study draw primarily on Sections C (Context), D (23 questions), and E (Research questions). The conclusions are listed in order from the general, i.e., environmental, contextual issues, to the specific, i.e., pertaining to the Web exhibits under study.

1. Web exhibits are experiential digital objects

The InterPARES 2 Project Proposal (p. 1.1-3) defines experiential digital objects "as objects whose essence goes beyond the bits that constitute the object to incorporate the behaviour of the rendering system, or at least the interaction between the object and the rendering system." Although the Web exhibits studied here were static documents from the creator's perspective, the interaction of the rendering system with the exhibits can cause considerable variance in the user's perspective of the records. Corporate standards for Web site development exist in the jurisdictions of both institutions participating in this study specifically to diminish or minimize the vagaries of this interaction. A specific finding here was that details of the preferred or "target" rendering system were assumed, but not conveyed by the creator along with the exhibits themselves.

2. Decentralized technological environment

Both institutions that provided the environment for the case study were organizations within larger, governmental structures—in one case a municipal government, in the other a provincial government. These larger organizations maintain a technological environment within which the two case study organizations must operate. These environments are themselves in a state of some change. For these reasons, interview subjects were unable to provide any details about system security, which, for example, is directly relevant to the benchmark authenticity requirement A.3 *Protective Procedures: Loss and Corruption of Records* identified in InterPARES 1. Because of the decentralized technological environment, technological contributions to record authenticity, reliability and accuracy were not explored in this study.

3. Nascent business process

During the study, development of institutional Web sites generally appeared to be an emerging business process (one case study researcher phrased this as a "trust-based work ecology") in that the Web-based resources were being developed to fulfil a "big idea" but there was no procedural context established in terms of which officers would fulfil which roles (e.g., sometimes the manager would also be the exhibit curator), or what records needed

³ Email message from Dr. Duranti, Project Director, to Jim Suderman, dated 28 June 2002.

to be created and how they would be maintained. Rather, various individuals participated in the creation of Web exhibits on an as needed basis, sometimes through business activities that were already being undertaken but were now adapted or applied to the creation of Web exhibits. Each individual's involvement was "trust-based." For example, the scanning technician was not required to report on the setting chosen for scanning a particular item. The scanned component was used on a basis of trust—the scanning technician's judgement in the matter was neither recorded nor challenged.

4. Limited or non-existent recordkeeping environment

The recordkeeping environments of the two institutions studied differed in some important ways. The city Archives, as one organization within a larger corporate entity, followed the corporate recordkeeping requirements, including a corporate recordkeeping file classification plan. Records created (on paper) in the development of Web exhibits at the city were filed according to this plan and retention was governed by existing retention authorities. However, interviewees did not believe that electronic records, including the Web exhibits themselves, were governed by these corporate procedures. Recordkeeping at the provincial Archives was not governed by any corporate or institutional requirements. Record creation and maintenance was *ad hoc*, at the discretion of individuals participating in the development and maintenance of Web exhibits. In the absence of a defined business process, neither record creation requirements were specified, with the exception of the Web exhibit itself, nor were retention requirements stipulated.

5. Legal and moral issues

Legal issues identified were those connected with laws governing governmental communication with citizens, including copyright (e.g., the use of images in Web exhibits), translation into French (a legal requirement for the provincial organization), accessibility to users with disabilities, protecting individual privacy (e.g., of donors of materials used in the exhibits), and using source materials consistent with the requirements stipulated in governing donation agreements.

Two moral issues were identified by this study. The first concerned the selection of exhibit topics and of source materials used within an exhibit. The issue was likened to self-censorship by one interviewee, and simple avoidance of controversy that might affect living individuals by another. The second moral issue identified had to do with accuracy, defined by one interviewee in terms of interpretive text being factually correct, and by another in terms of making choices (of facts or images) transparent to the user/visitor to the exhibit.

One identified ethical issue was the obligation of public archival institutions and professional archivists to utilize Web technology to make holdings as accessible as possible. Other issues identified included questioning who was excluded by the use of Web technology, and delivering Web content in such a way that would not be insulting or lead to bad feeling.

6. Web exhibits as records

Generally speaking, interviewees considered Web exhibits to be business records of the creating organization. One interviewee who thought that Web exhibits were not records did attribute them with unique characteristics, specifically bringing together source materials that would not otherwise be related by the institution, and with fulfilling the business purposes the institution set for the exhibits. The study team also considered whether the Web exhibits were simply publications, but, at least in the provincial corporate environment, there existed specific requirements for publications, most of which were not met by Web exhibits. The case study team concluded that Web exhibits were records of the creating institution because

- they were created to fulfil identified business purposes,
- they are unique, and
- the three sample Web sites did not meet the criteria for publications.
- 7. Record values

Because no appraisal of Web exhibits had been undertaken at either institution, it was not possible to identify what values (e.g., legal, fiscal, administrative) the creating organization attributed to them. In the absence of well-defined business processes for Web exhibit creation, the study team was not able to independently determine what these might be. This report incorporates speculation that, beyond the conventional values (identified above), values connected with open content and possibly publications as well might be attributable to Web exhibits. Understanding the values the creating organization places on the records is critical for determining authenticity requirements of Web exhibits.

8. Authenticity, accuracy and reliability

Generally speaking, the creators of Web exhibits based authenticity, accuracy and reliability considerations on principles or practices external to the actual business process. This is likely due to several factors: predominantly the nascent business process, the specialized (and trusted) competencies of the staff involved, and the presence of practices imposed from outside the institution (e.g., security of corporate Web servers on which the institutional Web site resides).

The applicability and comprehensiveness of the InterPARES 1 Benchmark Authenticity requirements were examined in the case of Web exhibits. Some of the requirements were absent, assumed, or unknown to the interviewees. Record authenticity was generally considered to be established and maintained by Web server security, for which procedural and technological details were unknown to the interviewees because they are outside the scope of the institution's competence. Also contributing to record authenticity are the corporate Web page templates provided for both institutions for all Web content. The template dictates much of the structure of a Web page, and includes visual cues (e.g., corporate logo), and mandatory relationships to other parts of the corporate Web environment. In the absence of record creation and keeping processes, record identity and integrity (Requirement A.1) were inconsistent.

Since one of the main purposes of Web exhibits is to represent institutional archival holdings, reliability was based on relationships established with the source records. At one institution, this was accomplished through reference code citations or hyperlinks from the Web exhibit to the relevant archival description in the institution's descriptive database. This links reliability within Web exhibits to reliability of records created in much better defined institutional business processes; in this case, the practice of archival description resulting in archival descriptive records. Reliability is also based on scholarly research practices.

Interviewees generally felt that Web exhibit contents were accurate both in terms of the components that comprise the exhibit and in terms of the exhibit as a whole. The accuracy of a digitized image, for example, was based on the skills and eye of the scanning technician as well as technology such as a calibrated display monitor, even while it was recognized that the digitized image might be poorly rendered by the user's platform. The trust in the technician's experience and judgement, as with reliability above, is based on the technician's primary function of digitizing analogue images (prints, negatives, slides, etc.) and creating high-resolution digital images of publication quality. From these high quality images, derivative images (with smaller file sizes) are created for use within Web exhibits.

For the exhibit as a whole, accuracy was based on principles of scholarly research, e.g., citing sources.

9. Digital components

Web exhibits at both institutions are formed by groups of Web pages. Each Web page is comprised of several digital components, ranging from a cascading style sheet for the whole institutional Web site to one or more image files for presentation on a specific Web page within a specific exhibit. In some instances, particularly the digitized images, the components may be copies of records. That is, in the context of Web exhibits an image may be a component of the record. In the context of the institution's visual holdings, the image may itself be a record. It is reasonable to conclude that the authenticity, reliability, and accuracy of a record that is used as a component in another record, contributes to the authenticity, reliability, and accuracy of that other record.

10. User response

Both institutions create Web exhibits not for their own internal business purposes but specifically as a tool of outreach to remote and new clients. For this reason, the fact that the records creator has no control over the client's choice of platform to render the Web exhibit is very relevant. Little user response information was available for study in this case, and what little there was tended to be anecdotal in nature. For example, one exhibit is apparently being used as a resource for teaching a course. In terms of determining the effectiveness of the efforts by the creators to establish authenticity, reliability, and accuracy in their Web exhibits, knowledge of the user's viewpoint is important. It is they, after all, who will be making use of the Web exhibits.

Regrettably it proved beyond the capabilities of this case study to gather data of user response to the Web exhibits under study. The best information on this aspect presented here is found among the user studies identified in the literature survey.

B. Statement of Methodology

The primary data gathering method was to interview Web exhibit creators. A slate of interview questions was developed in consultation with Ciaran Trace (UCLA), and reviewed by the study team. Once the questions were approved, four pilot interviews were undertaken at the City of Toronto Archives. Two study team members conducted these interviews and 'debriefed' each other after each interview. The four interviewees were defined by their roles as manager, Web site coordinator, scanning technician and exhibit curator. The interviews were recorded on digital audio tape, copied to CD-R and transcribed.

The results of these four interviews were analyzed by comparing interviewe responses with the (then 22) 23 questions. Because the interview questions appeared to effectively elicit the information needed to answer the 23 questions, the study team approved the interview questions following some minor modifications (e.g., splitting one question into two, changing some word choices). It was also decided that since no significant changes were made to the questions, the pilot interviews could form part of the research data.

The six subsequent interviews were undertaken at the Archives of Ontario, by the same two study team members as had conducted the pilot interviews. Interviewees included a manager, Web site coordinator, scanning technician, and three exhibit curators. As with the pilot interviews, these were recorded on digital audio tape, copied to CD-R and transcribed. For both sets of interviews, interviewees who identified documents or other reference materials in the course of their interviews were asked for copies of these documents. In all instances the documents were provided, although some in draft form. A literature survey on Web exhibits was undertaken at the same time as the interviews were conducted. Relevant literature is incorporated into this report. The survey results form Section F of this report.

For all interviews, the participation by the interviewees was voluntary and the interviews were done with the explicit permission of each institution's management. Approval for the study was obtained from the University of Toronto's Ethics Review Board⁴ and written permission to tape and transcribe the interviews for use in the study was obtained from each interviewee.

Analysis of the research data was an iterative process. An initial response to the 23 questions was developed and was modified over time as the study team used the data to address the Project's research questions. A process model of the creation of the Web exhibits was developed. Interviewees were asked if they would be willing to address follow-up questions and in all cases the response was positive.

The case study proposal called for a second gathering of data from two exercises:

- 1. a diplomatic analysis of the Web exhibits, and
- 2. subjecting the Web exhibits to a 'walk-through' of the InterPARES 2 Chain of Preservation model.

A diplomatic analysis was not undertaken for any of the exhibits because as the overall InterPARES Project developed, it appeared that a general diplomatic analysis would follow at

⁴ University of Toronto, Social Science and Humanities Review Committee, Ethics Review #9629.

the conclusion of the case studies. Note that elements of a diplomatic analysis were undertaken in response to question four (4) in Section D, below. The appraisal and preservation walkthroughs were not undertaken because it became clear from the interviews that Web exhibits have been appraised and preserved in neither host institution.

The study team planned to gather data from exhibit visitors using a short survey (12 questions were drafted) posted to each Web exhibit. Government requirements for the collection of information via a government Web site required a very strong business justification, and must be approved at the highest levels. Because any justification would be based on supporting InterPARES research goals as opposed to any defined requirement by the government, the online survey was dropped.

C. Context of Creation and Management of Web Exhibits

This section describes the different categories of context for the records being examined. It is normally the contexts that both define records and make clear their value. Traditionally, legal, fiscal and administrative record values have been assigned based on the creator's need for them, as set out in terms of the relationship of the records with the business activity that led to their creation. Secondary values may be assigned on the basis of the usefulness of records to subsequent users. In the case of Web exhibits it is difficult to determine value in conventional ways. For example, because a Web exhibit is unlikely to affect the legal rights and obligations of an individual or institution, Web exhibits will have a negligible legal value for their creating institutions. Since Web exhibits can be defined as open content—access to and use of them is effectively unrestricted—bases of value that are relevant to open content might be considered as forming a relevant context for Web exhibits.

"There is not a simple equivalency of the needs of the customers to the content offered on a given Web site," claims Magnus Cedergren. "On the contrary, it seems as if producers and creators decide what to offer, based on what they *would like to offer* as open content."⁵ Cedergren asserts that stimuli that control value exchange in a commercial environment are much less complex than those that control value in exchanges around open content. The following are some of the bases for value he identifies that are relevant to this study. For the producer or creator, these include:

- the stimulation provided to creators by cooperative projects,
- altruism,
- the opportunity to learn new things,
- the possibility of feedback or response from users, or
- just general publicity.

For the user, values include:

- the ability to respond to what is seen, and
- the ability to reuse the content.

⁵ Magnus Cedergren. "Open Content and Value Creation." *First Monday*, VIII, #8 (August 2003). Italics are Cedergren's. Note that Cedergren defines open content as "content produced not-for-profit – often collectively – with the intentional purpose of making content available for further distribution and improvement by others at no cost." (Article available at <u>http://www.firstmonday.dk/issues/issues_8/cedergren/</u> (accessed 14 January 2004).

Besides values based on open content, consideration of values normally connected with publications may be relevant.

Provenancial Context⁶

The two participating institutions are entities located within the central administrative governments of the City of Toronto and the Province of Ontario. The Toronto Archives is under the administration of the City Clerk, while the Archives of Ontario is within the Management Board Secretariat, the structure that supports the Management Board [Committee] of Cabinet.

The mandate of the Archives of Ontario is expressed in several documents. The first of these, *The Archives Act*, passed in 1923, authorizes the Archives to take custody of government records and undertake the following activities:

(a) the classification, safekeeping, indexing and cataloguing of all matters transferred to the Archives under section 3;

(b) the discovery, collection and preservation of material having any bearing upon the history of Ontario;

(c) the copying and printing of important public documents relating to the legislative or general history of Ontario;

(d) through (h) deal with collection of various types of records or records from various sources;

(i) the conducting of research with a view to preserving the memory of pioneer settlers in Ontario and of their early exploits and the part taken by them in opening up and developing the Province.⁷

More recently, the Archivist of Ontario has stated:

The Archives of Ontario belongs to the people of the province. Our records date back to 1729, document the history of 9 generations of Ontarians, and reflect all aspects of public and private life in Ontario.

On average 20,000 people visit the Archives Main Reading Room every year and the Archives handles 40,000 research requests annually. We are always looking for new and better ways to serve the public and reach the people of Ontario, and *our Web site has become an important tool for people interested in accessing the Archives' records.* In fiscal year 2002-2003 the Archives Web site received over 14,000,000 hits.⁸

The mandate of the City of Toronto Archives is found in the minutes of the Administration Committee of the City:

⁶ The creating body, its mandate, structure, and functions (indicators include organizational charts, annual reports, the classification scheme, etc.).

⁷ The Archives Act, R.S.O. 1990, c. A.27, s. 5.

⁸ "Reaching the Public" at <u>http://www.archives.gov.on.ca/english/about/use.htm</u> (accessed 12 January 2004). Emphasis added for this report.

The City of Toronto Archives preserves and provides access to records of enduring value regardless of media or format, that provide evidence of the decisions, policies, and activities of the City of Toronto, its predecessor municipalities, and its agencies, boards, and commissions which do not have their own archival programs. The Archives also acquires, preserves, and provides access to non-government records that make a significant contribution to an understanding of the development of the City, its natural and built environment, and the people who lived, worked, or had an impact upon Toronto.⁹

Juridical-Administrative Context¹⁰

The fundamental juridical context for the Archives of Ontario is provided by *The Archives Act* (1923). Within its operating environment, the Ontario Public Service, the *Management of Recorded Information Directive* (1992) provides a regulatory framework for the creation, management and disposition of recorded information. This Directive is supported by five advisory guidelines.

The *Directive* identifies the records management roles and responsibilities for all government offices. For program managers, i.e., managers of business areas, these include:

- ensuring that all recorded information under their immediate control is scheduled and in a manner consistent with government policies and guidelines;
- defining appropriate retention periods during the scheduling of recorded information;
- ensuring efficient storage and retrieval of recorded information under their control or custody;
- ensuring that recorded information under their control or custody is protected from physical damage and from unauthorized access, alteration, removal or destruction;
- ensuring compliance with the guidelines and standards for the management, development and use of ministry forms.

The Archives as an institution and the Archivist of Ontario as a Government officer have specific and central responsibilities to direct and support effective records management. Similarly, the City Archivist is responsible for developing and overseeing the implementation of effective policies and procedures for records management.

Other relevant legislation includes:

- Freedom of Information and Protection of Privacy Act (R.S.O. 1990, c. F.31);
- French Language Services Act (R.S.O. 1990, c. F.32);
- Human Rights Code (R.S.O. 1990, c. H.19); and
- Ontarians with Disabilities Act (S.O. 2001, c. 32).

⁹ Council Meeting, 13 July 1999, minute 3-23(1). Available at

http://www.city.toronto.on.ca/legdocs/1999/minutes/committees/adm/ad990713.htm (accessed 14 January 2004).

¹⁰ The legal and organizational system in which the creating body operates (indicated by laws, regulations, etc.).

Procedural Context¹¹

In both institutions, the business process leading to the creation of Web exhibits was in a formative stage. In each organization, some aspects of the process were clearly defined, whereas others appeared to vary or be *ad hoc* in nature.

The study took place in 2003, the year the provincial Archives' celebrated its 100th anniversary. In recognition of that milestone the Archivist of Ontario wrote,

[T]he 100th anniversary is about much more than just ourselves. It is a time to showcase Ontario's rich and diverse history through the varied documents preserved as one of the province's most valuable resources... These records constitute our society's memory, recognizing our individual and collective identities and histories. ...*The Archives of Ontario will be mounting onsite, Web, and travelling exhibits* on such wide-ranging themes as movie theatres in Ontario; Six Nations peoples; sports; natural resources; women's diaries; the War of 1812; architectural plans; and maps.¹²

The list of exhibit themes in this message resulted from a call by Archives' management for exhibit concepts. An ambitious schedule of on-line and physical exhibits was planned. As exhibits began to take shape, the Archivist of Ontario circulated an exhibit approval form created to clarify and track the exhibition planning process from start to finish. The archivist/curator responsible for an approved exhibit concept was to complete the form, forward it to his/her manager, who was to forward it in turn to senior management, including the institutional head. All final work was to be saved to a common drive (read only access by all Archives' employees) in the 'Anniversary/Exhibits' folder.

The mandate of the Toronto Archives includes arranging tours for organized groups, offering reference help, and *providing access to historic materials* to develop a better understanding of the City's history, its current issues, and its future directions.¹³

Creation of exhibits is not a new activity for archival institutions, but creation of Web exhibits is an emerging business activity not only in the sense that institutions are only recently investing in this activity, but also in that these records used within the exhibit are placed in a narrative context by the creator, rather than leaving it to the client to develop the narrative. Web exhibits reverse the normal archival practice of describing or representing holdings from the general to the specific. Exhibits focus on specific records with the purpose of attracting new users to the institution.

¹¹ The business procedure in the course of which the digital entity is created (indicators include workflow rules, codes of administrative procedure, classification schemes, etc.).

¹² See "A message from the Archivist of Ontario" at <u>http://www.archives.gov.on.ca/english/about/message.htm</u> (accessed 16 January 2004). Emphasis added for this report.

¹³ See "More on the City of Toronto Archives" at <u>http://www.city.toronto.on.ca/archives/index.htm</u>, emphasis for this report (accessed 20 January 2004).

Documentary Context¹⁴

For both institutions, Web exhibits form part of the fonds of the creating archival organization. In a portal-based Web environment, institutional Web sites such as those for both the City and the provincial Archives are 'nested' within the corporate database. This is not to say that they cannot be "deep-linked"¹⁵ but these Web sites and their contents need to be seen within the context of a corporate Web site that has some aspects of a recordkeeping system.

There is a corporate file classification plan in place for the City, which includes all the records of the City Archives. It is unclear, and appears to have been unclear to the interviewees, how this plan, and accompanying records retention authorities, governs records in electronic format such as Web exhibits, or the emails, scanned images, etc., that are their components.

Within the Web site of the provincial Archives, a site map provides the most comprehensive inventory of Web-based records. It is not integrated with any larger recordkeeping system, e.g., one that incorporates the records generated in the creation of the exhibits. There is no one recordkeeping system for records generated in the creation of exhibits. Different contributors (most notably the curator, Webmaster, scanning technician, and manager) each create and maintain their own records of this process. The Web site component files exist on both the development and production servers only. Thus, there is no common classification scheme or file naming convention.

A Government standard defines the requirements for the visual representation of the Ontario government on the Internet World Wide Web information network.¹⁶ A companion *Government of Ontario Internet Style Guide* sets out organizational schemes for Web site information, navigational aids, page design and page elements.¹⁷

For the purposes of this report it is important to understand that there are three categories of digital entities created in the development of Web exhibits. The first category contains what might be considered the digital components of the exhibit. Some of these components, in other contexts, may themselves be records, but in the context of Web exhibit creation, they are components and include digitized images, text, sound, and video files. The second category is the individual HTML-coded Web pages. These contain marked up narrative text, callouts to thumbnail and larger images, sound or moving image files in duplicate formats (i.e., for access on different computer platforms); in other words, the components of Web pages. Related to the Web pages are style sheets that are the means to efficiently create a common structure, including font size and type, for each Web page. The third category is the exhibits themselves, of which the Web pages are components. Recordkeeping practices for the first category may exist independently of recordkeeping for the other two categories.

¹⁶ GO-ITS 23.1 – Internet Public Access – Product Design. Available on the Government of Ontario intranet at <u>http://www.gov.on.ca/mbs/techstan/GOITS 23_1_Internet_Public_Access_Product_Design.htm</u> (accessed 20 January 2004).

¹⁴ The fonds to which the digital entity belongs and its internal structure (indicators include classification schemes, record inventories, indexes, registers, etc.).

¹⁵ "Deep-linked" refers to the ability to utilize URL's to provide a direct link to deep within a corporate Web site. This means that the navigation path can be direct, and does not need to begin from the corporate home page.

¹⁷ Available on the Government of Ontario intranet at <u>http://Webmaster.gov.on.ca/st/style_guide.htm</u> (accessed 20 January 2004).

Technological Context¹⁸

Both the City and the provincial Archives operate within a distributed technological environment. Five specific technological areas were identified:

- 1. security;
- 2. establishment of Web site standards;
- 3. Web site hosting;
- 4. recordkeeping technologies decentralized in both institutions; and
- 5. creation of Web site and exhibit components

In both institutions, the first two areas were completely outside the jurisdiction and responsibility of the institutions. Web hosting and recordkeeping (which in the case of the City Archives is governed by a records management application) were also addressed outside the institutions that create the exhibits. For this reason, information gathered by the case study has focussed almost entirely on the last area—the actual creation of Web site and exhibit components.

Both organizations use HTML coding to create Web pages (i.e., text marked up using HTML version 4.01 transitional). Web pages must follow a centrally defined form or template. The template conforms to the corporate visual identity policies and is created using components (e.g., logos) and mandatory structure requirements (e.g., header menus). Web pages are governed by style sheets that provide consistency in terms of font size, type and color. Besides presenting a common "look and feel" for visitors wherever they are in the corporate Web site, Web pages also incorporate requirements that have been established to minimize the impact of Web page rendering by the widely varying technology base of users or visitors to the Web sites (i.e., the nature of the user's connection to the Web, processing capacity of the computer used to access the Web sites).

Neither organization hosts its own site, but rather its site is hosted by a central IT unit within the respective corporation. Only the provincial Archives has direct access to the production server that hosts the institutional Web site. This configuration is consistent with the centralization of specialist skills (e.g., site security, Web site management, etc.).

¹⁸ The characteristics of the technical components of the electronic system in which the record is created.

D. Addressing the 23 Core Research Questions

1. What activities of the creator have you investigated?

The two creators investigated, the City of Toronto Archives and the Archives of Ontario, have mandates to undertake many activities. The case study investigated activities contributing to the creation and maintenance of Web exhibits; these include the promotion, publicizing and management of archival outreach activities through the maintenance of an institutional Web site, the curating of Web exhibits, and the provision of specialized access to records. This latter function utilizes specialist subject knowledge by archives staff to support researcher access.

2. Which of these activities generate the digital entities that are the objects of your case study?

Building and maintaining a Web site are activities that support the generation and preservation of Web exhibits. Promotional activities require oversight and coordination: "[D]etermining where we are with our exhibits and other activities associated with that site" occupies a large portion of managerial time through coordinating media conversions (primarily scanning of documents), developing accompanying exhibit materials, and supporting how these are brought together to meet institutional goals and constraints (e.g., appropriate content). Curating is the primary activity that generates Web exhibits.

3. For what purpose(s) are the digital entities you have examined created?

Interviewees identified a number of purposes served by Web exhibits. Generally, Web exhibits support provision of access, identified by seven of the ten interviewees. Access is defined both in terms of access to unpublished or previously poorly described materials as well as in terms of remote and around-the-clock access. Individual exhibits can also serve particular purposes. For example, the Government of Ontario Art Collection exhibit provides a means of bringing into a gallery-like setting a collection that is and will likely remain scattered across a huge province.

Martin Kalfatovic identifies five types of exhibitions:

- Aesthetic: organized around the beauty of the objects
- Emotive: designed to elicit an emotion in the viewer
- Evocative: designed to create an atmosphere
- Didactic: constructed to teach about something specific
- Entertaining: presented just for fun.¹⁹

Interviewees often attributed more than one purpose to the exhibits they had helped create. For example, the Eaton's exhibit was created to be informational, entertaining and emotive

¹⁹ Martin R. Kalfatovic. *Creating a Winning Online Exhibition. A Guide for Libraries, Archives, and Museums* (Chicago and London: American Library Association, 2002), p 3.

(nostalgic). There was considerable emphasis on the "fun" aspect of Web exhibits, as part of their purpose was to draw in new users of archival resources.

Other stated purposes for Web exhibits included:

- evidence of how archival institutions are preserving societal memory;
- illustrating the relevance of archival institutions in "the information age;"
- they are seen to "humanize" archival institutions, with theme phrases like "Bringing the Archives to Life;"
- providing links to other products, especially on-line ones like an images database or descriptive database;
- provision of creative projects for archivists and related staff involved in the creation of the exhibits.

All these purposes are accomplished at less cost and with greater flexibility in a Web environment than in a physical one.

4. What form do these digital entities take? (e.g., e-mail, CAD, database)

Web exhibits, at least those created by the two institutions under study, are in the form of hyperlinked Web pages, containing narrative text and images, and differentiated by visual cues specific to each exhibit. Supporting administrative records establish the relationship of each exhibit to institutional business practices and the source records used to create the exhibits. The pages are created from digital components. In each case, the exhibits reside in a larger, corporate Web site.

The form exhibits take varies with how they are accessed. Curators or Web site administrators can go "behind the scenes" where the digital components, and the file structures in which they reside, are evident. Viewers access the exhibits through an internet browser (e.g., Microsoft Internet Explorer), which accesses the digital components within the context of the Web page, i.e., the browser structures their view according to the HTML coding. Note that if their browser supports the functionality, viewers may view the HTML coding, but that still does not allow them direct access to the components of the Web page.

4a. What are the key formal elements, attributes, and behaviour (if any) of the digital entities?

In the context of this case study, this question is understood to refer to intrinsic and extrinsic elements of the Web exhibits.²⁰ Elements were determined based on how the exhibits are normally accessed, i.e., via a Web browser. Some of the interviewees, because of their roles and responsibilities vis-à-vis Web exhibits, were able to access exhibit components directly using a file manager, but this is not how the records were designed to be viewed.

²⁰ The terms "intrinsic" and "extrinsic" are from the science of diplomatics. See Luciana Duranti, "Diplomatics: New Uses for an Old Science (Part V)" *Archivaria* 32 (Summer 1991), pp. 6-24, for a listing and explanation of extrinsic and intrinsic elements for traditional documents.

Elements and attributes²¹ that are considered integral to the validity and completeness of the document include (intrinsic elements):

- navigation links from the institutional home page to a listing (with or without a précis of the exhibit);
- exhibit content, normally comprised of Web pages containing text, images, and occasionally with sound or video files;²²
- government visual identity signs, especially the provincial and city logos and the institutional name²³ (note that on the opening page of "Canada's First Subway" there is no explicit reference to the City Archives although it is suggested by the contents navigation bar on the left);
 - Provided by a central body for all Ontario Web sites are:
 - Standard disclaimers;
 - Instructions for accessing and installing plug-ins;²⁴
 - Copyright statements;
 - Privacy statements;
 - Graphics (.gif format) are provided for every ministry name;
 - Graphics for mandatory toolbars [navigation links] are provided;
 - Ontario logo, mandatory for every government Web page, and footer graphics are provided.
 - The last three are compliant with the W3C's WAI (Web site Accessibility Initiative) requirements, and all text is provided in English and French.
- because of the self-determined navigational potential provided by Web technology, there is no obvious "conclusion" or "closing" of an exhibit, i.e., no eschatocol²⁵;

Elements that constitute the material make-up of the document and its external appearance include:

- A corporate standard Web page template²⁶ (see Appendix 2);
- The cascading style sheet created for the Web site as a whole;
- The institutional Web site (contains other exhibits, links to databases, external links, etc.);

²¹ "Element" is defined in the InterPARES Terminology database as "A constituent part of a record's documentary form. "Attribute" is defined as "A defining characteristic of a record or of a record element. (Diplomatics)." The relational database management definition is not applicable here(database accessed 27 January 2004). No distinction is made between elements and attributes in the following.

 ²² Content is defined as follows in the glossary: "The content of a document refers to what it says to the user through natural language, images, sounds, movies, animations, etc." W3C. Web Content Accessibility Guidelines 1.0 (5 May 1999). Available at www.w3.org/TR/WAI-WEBCONTENT/ (accessed 29 January 2004).
²³ On the opening page of "Canada's First Subway" there is no explicit reference to the City Archives although it is suggested by

²³ On the opening page of "Canada's First Subway" there is no explicit reference to the City Archives although it is suggested by the contents navigation bar on the left, see <u>http://www.city.toronto.on.ca/archives/canada_first_subway/index_subway.htm</u> (accessed 30 July 2004).

²⁴ A "plug-in" is an application that interacts with the browser and is needed to access certain formats of Web content.

²⁵ See Duranti, "Diplomatics (Part V)" Archivaria 32 (Summer 1991), p. 11, for a description of the eschatocol.

²⁶ Ontario government Web standards are heavily based on the W3C Web Accessibility Initiative (WAI). Ontario IT standard, *GO-ITS 23.1 – Internet Public Access – Product Design*, requires that Government Web sites "conform to the Priority 1 and Priority 2 Web Content Accessibility Guidelines of the W3C Web site." [section 1.7.4] The Guideline is organized around two general themes: 1) ensuring graceful transformations, i.e., pages that remain accessible despite physical, sensory, and cognitive disabilities, work constraints and technological barriers; and 2) making content understandable and navigable, i.e., using clear and simple language and providing understandable mechanisms for navigating within and between pages. Of the 14 'Web content accessibility' guidelines identified, the first eleven are related primarily to graceful transformations, with the last three relating to making content understandable and navigable.

- The corporate Web environment (contains links to all government Web sites, news releases, etc.);
- HyperText Markup Language, specification version 4.01²⁷;
- Navigation bars required at the top / bottom / side of each Web page; and
- A "feedback form" that utilizes Common Gateway Interface (CGI) script to interface with an email application.

The source coding for "The Toys of Our Childhood" exhibit was reviewed by Jim Suderman in some detail. It is worthwhile noting that some elements identified as intrinsic elements appear within each Web page of the exhibit. For example, each page has sections labeled "head" and "body." In this particular instance as well there were remarks within the coding indicating where "content" began and ended.

Additional attributes may be found in the specifics of the HTML coding. The study team did not have the expertise to undertake any such analysis.

The behaviour²⁸ of the rendering platform takes place on two levels:

- 1. the feedback form is a CGI program executed in real-time; and
- 2. the way the user's browser interacts with the HTML coding of the exhibits.

The feedback form activates the CGI script, which resides on the hosting Web server. The CGI script activates an email application to open a blank message template. The customer's comments are loaded into this template. The email application then sends the email to the Archives.

Figure 1 illustrates how different browser applications and display technologies affect the presentation of Web exhibits. The differences reflect some of the interaction between the different systems for hosting and accessing the exhibits. Experiments also showed that browsers handle off-line Web content differently from on-line content. For example, Figure 2 shows part of the index (opening) page of "The Toys of Our Childhood" exhibit at the Archives of Ontario Web site, as opened from off-line storage (a CD-R) using Microsoft Internet Explorer, version 6. Figure 3 shows the same page, opened from the same source, using Opera, version 7.²⁹

Note that the addressing syntax for each browser is different, even though the source is the same CD-R. This may account for the problems Opera has with finding or loading all the images and the style sheet. When the same browsers are used to access the exhibit in an on-line environment, both correctly present the exhibit. In fact, the Web site coordinator tests the consistency of presentation using three different browsers (Microsoft Internet Explorer, Netscape Navigator, and Opera).

²⁷ See "HTML 4.01 Specification" at <u>http://www.w3.org/TR/html401/</u> (accessed 27 January 2004).

²⁸ "Behaviour" is not defined in the InterPARES Terminology database. (checked 27 January 2004).

²⁹ In both figures, the operating system is Windows 2000.



Figure 1. Comparing the effect of browser applications and display technologies



Figure 2. Off-line display using MS Internet Explorer



Figure 3. Off-line display using Opera

4b. What are the digital components of which they consist and their specifications?

Of the three Web exhibits identified in the case study proposal, only two have been posted to date. Internal components, i.e., digital components within the internal computer file structure of each exhibit, are the following:

• HTML Web page files

The HTML page files created for the Archives of Ontario exhibits are created using the HTML 4.01 transitional specification. "Transitional" here refers to a 'flavour' of HTML 4.01 that allows Web page developers to take advantage of this specification's features while making small adjustments for the benefit of those viewing the pages with older browsers, i.e., it is not "pure" or "strict" usage of the HTML 4.01 specification.³⁰

• Text

Text is provided in up to four formats: primarily HTML, occasionally in Microsoft Word, Adobe Portable Document Format (.pdf), or ASCII text.

• Image files ("full size," "small" and "thumbnail")

All are in jpeg [Joint Photographic Experts Group] format, a lossy compression format for images. These components are derivatives of high resolution tiff images.³¹ The jpeg format is now ISO standard *Digital Compression and Coding of Continuous-tone Still Images, Part 1: Requirements and Guidelines* (ISO/IEC IS 10918-1). The jpeg format appears to have a baseline specification, from which additional extensions are added, which may or may not be supported by supporting applications.³² Note that colours for images can be defined in at least nine ways in HTML style attributes and in Cascading Style Sheets.³³ Full size jpeg file sizes are in the 85-500 KB range, "small" images are in the 15-66 KB range, thumbnails are in the 11-25 KB range.

Some graphics interchange format (.gif) images are used, although not for exhibit images per se, but rather for enhancing the presentation of the exhibit, e.g., lines.³⁴

Kalfatovic indicates that Web-deliverable images "could include full-size images, thumbnail images, and enlargements of portions of the objects. These images are cropped, de-skewed, and rotated. Each image is resized according to the project/item plans (discussed below). Also, since these images are designed for viewing on the Web, you should reduce each to between 72 and 75 dpi to create a smaller file. Generally, these files will be in jpeg format at Photoshop quality level 7 (high).

From the first jpegs, the following Web-deliverable images may be created:

• Full-size images (ranging from 500 to 800 pixels);

³⁰ See W3C "HTML 4.01 Specification" at <u>http://www.w3.org/TR/html401/</u> for details (accessed 29 January 2004).

 ³¹ Tiff stands for Tagged Image File Format, a popular, flexible and public domain raster file format. The tiff specification is available at <u>http://partners.adobe.com/asn/developer/pdfs/tn/TIFF6.pdf</u> (accessed 29 January 2004).
³² See "JPEG Compression" at <u>http://netghost.narod.ru/gff/graphics/book/ch09_06.htm#JPCO</u> and "JPEG File Interchange

³² See "JPEG Compression" at <u>http://netghost.narod.ru/gff/graphics/book/ch09_06.htm#JPCO</u> and "JPEG File Interchange Format" at <u>http://netghost.narod.ru/gff/graphics/summary/jff.htm</u> (both sites accessed 29 January 2004).

³³ See *Defining Colors* at "HTML Station" at <u>http://www.december.com/html/spec/colordef.html</u> (accessed 2 March 2004). Not all browsers support all nine ways of representing colors.

³⁴ See CompuServe Incorporated. (1990) *Graphics Interchange Format, Version 89a.* <u>http://www.w3.org/Graphics/GIF/spec-gif89a.txt</u> (accessed 30 Aug 2006).

- Mid-size images (pixel size will depend on use)
- Thumbnails (generally 100 and 200 pixels for portrait- and landscapeoriented images respectively)."³⁵
- Sound files
 - Sound files are in .wav [waveform] (PC) or .aif (Mac) formats.³⁶
- Video files

Video files are in Windows Media Player (.wmv) for PC's or Quicktime movie file format (.mov) for Mac computers.³⁷ Video files, because they can become so large for just a few seconds of running, are not only provided in two different versions, but in three different resolutions as well.

A significant consideration in the development of Web pages is loading time. Small files load faster. Since the target audience is intended to be as wide as possible, accommodating older, less powerful technology such as modems to access the Web is important. This is done by minimizing file sizes and eliminating or minimizing reliance on "plug-in" applications like Adobe's Acrobat Reader. Similarly, because it is known that some of the viewing audience are disabled, *The Government of Ontario Internet Style Guide* recommends the provision of "equivalent alternatives to auditory and visual content. These include <alt> tags for images, redundant text links for active regions of image maps, transcripts of audio and descriptions of video content."³⁸

Components that contribute directly to the appearance or functionality of the Web exhibits include:

• Style sheets³⁹

For the Archives of Ontario, a single style sheet is used for its entire Web site.

• CGI script⁴⁰

Although use of CGI is limited within the exhibits under study, the CGI script enables visitors to the Web exhibits to communicate with the exhibit creators using email. Because CGI scripting negotiates an interface through the government firewall between an external user and the hosting Web server, it poses

³⁵ Kalfatovic identified 650 and 1000 pixels for full-size images, and thumbnails sizes of 150 and 250 pixels for portrait- and landscape-oriented images respectively. Kalfatovic, pp. 50-51.

³⁶ See summaries of the .wav format specification at <u>http://www.borg.com/~jglatt/tech/wave.htm</u> (accessed 29 January 2004) and at <u>http://www.sonicspot.com/guide/wavefiles.html</u> (accessed 27 July 2004). I gather the specification has something to do with chunks. Anyway, good luck. See also *Specification of the Broadcast Wave Format: A format for audio data files in broadcasting, Supplement 1 – MPEG audio* at <u>http://www.ebu.ch/departments/technical/tech/tech_32/tech_t3285_s1.pdf</u> (accessed 29 January 2004).

For Audio Interchange File Format specification see Audio Interchange File Format: "AIFF" A Standard for Sampled Sound Files, Version 1.2, Apple Computer, Inc., available from "Wotsit's Format" at <u>http://www.wotsit.org/search.asp</u> (accessed 29 January 2004). This format also involves chunks.

³⁷ The .mov file format specification is available from "Wotsit's Format" at <u>http://www.wotsit.org/search.asp</u> (accessed 30

January 2004). All that was found for the .wmv format was a Microsoft reference describing this format as a "Windows Media based file which contains both video and audio." *Guide to Windows Media File Extensions* at

http://www.microsoft.com/windows/windows/windows/media/format/extensions.aspx (accessed 30 January 2004).

³⁸ Government of Ontario Internet Style Guide, section IV.3.4. Screen Readers and Public Terminals. Available on the Government of Ontario intranet at <u>http://Webmaster.gov.on.ca/st/style_guide.htm#V11</u> (accessed 30 January 2004).

³⁹ See W3C, *Cascading Style Sheets, level 1*, for style sheet specification. Available at <u>http://www.w3.org/TR/REC-CSS1</u> (accessed 30 January 2004).

⁴⁰ See *The Common Gateway Interface* for specification of CGI/1.1. Available at <u>http://hoohoo.ncsa.uiuc.edu/cgi/overview.html</u> (accessed 30 January 2004).

a security risk. For this reason, CGI scripting is undertaken centrally, rather than in the creator's organization.

• Required visual identity images

The components required for inclusion by the larger corporate environment to support the corporation's visual identity and compliance with corporate Web site standards are specified, at least for the Archives of Ontario, at an intranet site. These components are in graphics interchange format (.gif). Detailed specifications are available at the intranet site; for example, the provincial "Internet Logo used in W3C WAI compliant templates" (figure 4) is 246 by 61 pixels. There is a repository of standard graphics maintained by the Province.



Figure 4. Ontario Government logo

• Browser specifications

These are only indirectly within the control of the creating organization. The Archives of Ontario tests its Web exhibits against three browsers—Microsoft Internet Explorer, Netscape Navigator, and Opera from Opera Software. The goal is to create exhibits that will be properly presented regardless of the user's browser or version. The three browser applications used for testing are proprietary and so access to the software specifications is at the discretion of the corporations that own these applications.

• Display specifications

This component, like the preceding browser specifications, is only indirectly within the control of the creating organization. Currently, the target for the Archives of Ontario Web site as a whole is that it will display properly on a monitor with a 640 x 480 pixel setting.⁴¹

4c. What is the relationship between the intellectual aspects and the technical components?

If the intellectual aspects are defined as the content, structure, and context of the Web exhibits, then the relationship between these aspects and the digital components varies. The narrative text, accompanied by image, sound and video files, is related to the content and structure of the exhibits. That is, the content and much of the structure of the exhibits would be unaffected if these files resided on and were accessed from any other institution's Web server.

The underlying components and mandatory graphics relate to aspects of the structure and the context of the Web exhibits. It is these components that tie the Web exhibits to the

⁴¹ See Government of Ontario "Internet Style Guide," section IV.3.3.1 "Screen Resolution." Available on the Government of Ontario intranet at <u>http://Webmaster.gov.on.ca/st/style_guide.htm#V11</u> (accessed 27 July 2004). See also Figure 1, which contrasts an image of part of a 17" monitor using Internet Explorer, version 6, with the display on a Audiovox cell phone using a generic 'micro'-browser.

context of their creation and the structure of Web pages imposed by the creator's administrative and technological contexts.

Finally, the user's components (browser and choice of display platform) can significantly affect what of the content, structure, and context provided by the creator is actually retrieved and accessible. In Figure 1, for example, where an older cell phone was used to access "The Toys" exhibit, the browser did not support graphics (or sound or video) and did not recognize the "alt tags" included to alert the viewer that graphics were there. The display platform was a tiny screen that displayed only in monochrome. Some of the components required by the Archives' corporate environment were in evidence in this platform, including the navigation links found in the top right of the "conventional" image.

4d. How are the digital entities identified (e.g., is there a [persistent] unique identifier)?

Within the institutional Web sites, each Web exhibit is identified by its title. When viewing the source coding for each Web page within each exhibit, each page is also titled, although this may be simply a practice of the individual Web site developers rather than any institutional requirement or record creation best practice. The identification of the components of the exhibit proceeds in a variety of ways. The imaging technician prepares most images used in the exhibits, and the master copies of these images are assigned two unique identifiers. The first links the image to its larger, provenancial context (i.e., to the context of its creation), the second is an "image number" that identifies the image within the larger visual database.

The Web exhibits themselves have a URL (Universal Resource Locator) assigned within the institution's Web domain. It is expected that these URLs will remain constant indefinitely, meaning as long as the host institutions have their own defined Web space, but it is not a Persistent URL (PURL).⁴² Also, it is possible to "deep link" the pages of Web exhibits, i.e., URLs can be provided to specific pages within exhibits, rather than only to the index page from which the user would have to navigate independently to an exhibit or specific page within one.

4e. In the organization of the digital entities, what kind of aggregation levels exist, if any?

Within the Web exhibits themselves, the Web pages reflect aggregations of text, images, and other components of the exhibit that are conceptually linked. For example, "The Toys" exhibit has a page for each decade of the twentieth century.

⁴² A PURL is a Uniform Resource Name, i.e., a reference to the resource content rather than its technological address, which is maintained in a server. The technological address is monitored for currency and any changes are recorded in the PURL server. Clients requesting a resource use the PURL and are then redirected to the current URL for the resource. PURL is an Online Computer Library Center initiative. <u>http://purl.oclc.org/docs/new_purl_summary.html</u> (accessed 20 July 2004).

Within the institutional Web sites, the Web exhibits are grouped together for the navigational convenience of the user.

4f. What determines the way in which the digital entities are organized?

The interviews did not provide specific information on how Web exhibits were organized. However, it seems that the presentation of Web exhibits is planned primarily by the Web site coordinator to enhance the experience of the user. The goals appear to be simplicity and flexibility: it should not be complicated for the viewer to navigate through the exhibit and s/he should be free to navigate through however s/he pleases. To support these goals, the exhibit content as a whole is conceptually divided into segments, referred to as "chapters," which are designed to stand as independently as possible within each exhibit.

Within individual exhibits the organization appears to be at the convenience of the Web site developer. In the few exhibits examined, the "index" page appeared in the root folder for each exhibit. Images used in each exhibit were generally grouped within a single sub-folder.

In terms of the organization of all Web exhibits within the Web site of each institution, the Archives of Ontario exhibits were simply listed in the reverse order of appearance, i.e., the first exhibit appears last on the list. The Toronto Archives appears to follow the same arrangement.

5. How are those digital entities created?

This question will look at the information system as a technological environment within which Web exhibits are created. Question 6 will look at the processes and procedures that provide the substance and authority for Web exhibits.

The Web site coordinators at each institution use servers for the development of the exhibits themselves. These development servers behave in all ways as a production server, i.e., the server supports general or public access to the institution's Web site, except that they are available only to those developing Web content. The development server is not, however, a mirror of whatever goes into production because rejected images, text, or structural components (how the exhibit is actually readied for presentation) may reside on the development server, but are not transferred to the production one.

Using specialized software like DreamWeaver, Web site coordinators size and format text and images provided by exhibit curators. The coordinators also decide how large each Web page within an exhibit will be—partly on the basis of download times (a user consideration), partly on the basis of how best to develop the exhibit narrative. When all the participants (Web site coordinator, curator, manager) are satisfied with the exhibit product, it is moved from the development server to the production server, thereby becoming accessible to all via the Web.

Neither creating institution controls the production environment. Their control extends only to moving prepared content to the production server. The production environment is centrally administered, i.e., all administrative units within the larger corporate entity, such as the archival institutions in this study, share one production environment. Reasons for this centralized control include maintenance of a common Web environment and security for all institutions within the enterprise. Accomplishing this requires specialized skills and tools and the cost of acquiring and maintaining these for every institution would be prohibitive and unnecessary.

5a. What is the nature of the system(s) with which they are created? (e.g., functionality, software, hardware, peripherals, etc.)

The system consists of Web development software, a personal computer in a Local Area Network (LAN) environment used by the Web site coordinator, linked to a development server, linked to a production server. The various technological platforms support different permissions for the different participating individuals. Finally, the system includes, indirectly, the platform (hardware and software) of the user.

The Web development software enhances the Web site coordinator's productivity by minimizing the writing of HTML code. This is undertaken either directly by the software through the coordinator's manipulation of it, or indirectly through the creation of templates and style sheets. The Web site coordinator works on a personal computer, linked by a LAN to the development server, networked storage space, local storage space, the corporate intranet, and to an email exchange server to facilitate communication with other contributors to the Web exhibit. Permission levels vary for each of these servers and storage spaces. The nature of the link to the production server is not clear. It may be that a file transfer protocol is used by the production environment to load new content onto the institution's Web site.

The user accesses the Web hosting server (the production server?) utilizing their own access device and browser software. The functionality of the user's platform can vary considerably.

5b. Does the system manage the complete range of digital entities created in the identified activity or activities for the organization (or part of it) in which they operate?

Each institution's Web site maintains all Web exhibits created to date by that institution. That is, these are maintained on the production server on behalf of the creating organizations.

6. From what precise process(es) or procedure(s), or part thereof, do the digital entities result?

There are three main processes that contribute to the creation of Web exhibits: research, administrative, and technological. These three processes are, for the most part, concurrent. Each

of these processes incorporates aspects of quality assurance, which might be considered as a fourth process. Although both the research and the technological processes are highly creative, i.e., how the processes are completed will vary with each exhibit, they are also both constrained by external requirements (e.g., corporate Web page template) or conventions (academic research). Each of these processes may draw upon existing processes or procedures within the respective organizations. For example, the creation of scanned images for use within Web exhibits is an existing process for creation of reproductions for institutional clients and for populating the database of visual images.

Research process

One interviewee (exhibit curator) specified three main phases: 1) getting started; 2) the investigative work; and 3) the *mise en place*. Statements from other interviewees were consistent with these phases.

- 1. Getting started involves setting the subject and focus for an exhibit. This can be done in many different ways. For the exhibit curator who identified the three phases (above), the exhibit allowed him to combine his passion for his proposed topic with the opportunity to present relevant records in the institution's holdings to the public.
- 2. Researching the topic begins with a review of secondary (i.e., published) sources, which can help determine where to look for relevant records from among the archival holdings. Use of the database of descriptions of archival holdings follows. At this point, a first selection of items for use within the exhibit is made. This may involve examining the materials at the individual document level and applying predetermined selection criteria, such as
 - authenticity of the records
 - variety of narrative viewpoints
 - crisp or colourful quotations that provide context for the narrative
 - documents with visual appeal.

This research phase includes gathering of quotations and citations of materials consulted or identified for possible inclusion within the exhibit.

This phase might draw upon the institution's existing process for retrieving archival materials. This would generate retrieval request forms and other documents related to this process. Similarly, an outcome of this phase might be the preparation of a new, or modification of an existing, finding aid in accordance with the institutional processes for such an activity.

3. The *mise en place*: With the list of selected documents, the story line is finalized and a short list of items chosen.43 "Between the selection of records and their publication on a Web page, many steps are required, including conservation work and digitization. Often enough, larger or more fragile documents need to be photographed prior to be[ing] digitized." Similarly, selected quotations and images are insufficient to the creation of an effective exhibit. Writing of texts, including revising and proofing them, involved input from both experts in the field and the potential audience.

⁴³ In one case the curator identified 2400 images initially, from which 50 were finally selected for inclusion in the exhibit.

The responsibility for this process belongs primarily to the curator.

Administrative process

This process reflects the connection of the Web exhibit creation with the mandate and competence of the creating institution. This process is also not defined in step-by-step terms, but rather in terms of approvals that must occur at various points in the other processes. There are two key approvals. The initial approval is for the exhibit topic itself. This approval clears the way for the research and technological processes to begin. The final approval governs the final draft of the exhibit and is given by the manager of the Web site and the institutional head. Interim approvals govern the focus of the narrative, selection of images and text, allocation of resources—photographing oversize items, e.g., paintings, or conservation work required on source items—and the 'look and feel' of the technological components of the exhibit.

Generally, this process seemed fairly informal and would likely vary between institutions and between exhibits created within the same institution. It is likely that it would follow a pattern consistent with the general approach to supervision and managerial oversight within the institution and the approaches to these tasks taken by individual managers. At one institution, the manager reports on the Web site and its contents bi-weekly. The administrative process is primarily a management responsibility.

Technological process

The technological process has two distinct sub-processes: the creation of the Web exhibit itself, normally the responsibility of the Web site coordinator; and the creation of the components to be used within the Web exhibit, a responsibility shared by the Web site coordinator with the scanning technician.

The creation of digital components—predominantly scanned images, narrative and attribution text (i.e., citations), sound or video files—may be straightforward (i.e., simply scanning an item), or complex, if conservation work, or a preliminary photograph must be undertaken prior to scanning. For images, it appears that a high quality image in tiff format is created from which derivative jpeg format images are created for use as components. This may be a result of an existing process within both institutions of maintaining a database of images. Similarly, the documentation for the creation of the initial scanned images may utilize existing processes for handling reproduction requests from the public or inclusion of images in the images or visual database. The responsibility for the creation of digital components is generally shared between the imaging technician and the Web site coordinator.

Utilizing reference documents developed by the curator in the research process, ranging from hand-drawn sketches to MS PowerPoint slides to tables in MS Word linking images to reference codes, the Web site coordinator incorporates the chosen components into the exhibit structure. Each HTML-encoded page of each exhibit is created within the corporate Web page template and in accordance with other requirements, e.g., translation or provision of access for individuals with disabilities. Within these boundaries, the Web site coordinator creates an overall design and navigational concept, i.e., the "look and feel," to create an appealing exhibit that supports an appreciation of the content. This collaborative activity uses space on the development server involving the curator and manager, and provides the manager an ongoing opportunity to monitor

the quality and content. The responsibility for creating the Web pages of the exhibit belongs to the Web site coordinator.

The processes outlined above are consistent with Kalfatovic, who generalizes the creation of Web exhibits as comprising of the following steps:

- Preparation of the exhibition proposal
- Proposal evaluation
- Selection of objects
- Drafting of the script
- Preparation of objects
- Exhibition design and Web creation
- Final editing
- Additions, changes, corrections⁴⁴

7. To what other digital or non-digital entities are they connected in either a conceptual or a technical way? Is such connection documented or captured?

The following entities are connected to Web exhibits in a conceptual way:

Research	process
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	Retrieval requests—paper forms for requesting the retrieval of archival records
	used for institutional retrieval activities;
	Permissions (copyright)—hard copy correspondence recording permissions;
NT 1° '4 1	Hand-drawn sketches—created by curators to help conceptualize exhibit ⁴⁵ ;
	Physical exhibits—a number of Web exhibits had physical counterparts;
Non-uighai	Source documents—the actual archival documents from which text was
	excerpted or digital reproductions made;
	Collection management files—the files maintained to administer archival
	holdings and the art collection;
	Physical exhibits—counterparts to the Web exhibits;

	Definition document—a document (word-processed) that identifies source
	records with reference codes and story line;
	Exhibit mockups—created by curators (e.g., using PowerPoint) to help
Digital	conceptualize exhibit;
_	Descriptive database—reference codes to archival descriptions of source
	materials;
	Visual/images database—reference database to individual images.

⁴⁴ Martin R. Kalfatovic, p. 20.

⁴⁵ The various documents identified under the research and administrative processes may be compiled, or partly compiled, in project files created and maintained by exhibit curators pertaining to each Web exhibit. One interviewee was confident that her paper files were governed by corporate recordkeeping, but did not know whether her complementary computer files were.

p. 000000
Approval form—a paper record complete with signatures (although circulated as a policy this does not look like it has actually come into use);
Translations—where required, translation of text and descriptions;

Administrative process

Digital	Internal emails—reflecting ongoing consultations and approvals;
	External emails—"feedback" emails from visitors to Web exhibits;
	Announcements—notifications on Web site home page of new exhibits.

Technological processes

Non-digital	Reproduction request form—a paper form used to record and administer requests for copies of records, elements from this form are also entered into a database to administer payment;
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Digital	Project folders-containing exhibit components, emails, and other documents
	pertaining to a particular Web exhibit;

The following entities are connected to Web exhibits in a technological way:

Digital	Development server site—the Web site coordinator's "sandbox" for developing Web content in an environment where that content behaves as it will in the production environment:
	Institutional Web site—In each case, the Web exhibits are connected
	technologically to the institution's (production) Web site as a whole. Similarly,
	each institution's Web site forms a component of the larger corporate or
	enterprise Web site;
	Other Web exhibits—Web exhibits are grouped together within the institutional
	Web sites;
	Web site log files—Software monitors various quantifiable details concerning
	use of the Web site, and can report it in various ways and various levels of
	detail. At the Archives of Ontario, only summary reports for the Web site as a
	whole are kept, i.e., there are no specific reports on Web exhibits.

Generally speaking, there appeared to be no consistency in terms of whether connections to the entities identified above were captured or documented. Because the processes are generally creative or still emerging, it is unlikely that they are centrally documented.

8. What are the documentary and technological processes or procedures that the creator follows to identify, retrieve, and access the digital entities?

The following processes are used by the creator to identify, retrieve, and access the Web exhibits. It should be emphasized here that all of an institution's Web exhibits are maintained on the Web site of that institution.

Identification	Web exhibits are given unique titles;
	Corporate Web page templates identify exhibits as belonging to both the
	creating institution and the larger corporate entity;

Retrieval	Although meta tags are created and used to assist retrieval by Web search engines, the larger search engines, such as Google, search the content of Web pages. For this reason, contents of the first page are developed to support the finding of the first page of an exhibit, rather than any other page.
	Web exhibits are constructed to allow "deep-linking," i.e., the ability to link to a specific page within a Web site, rather than to the exhibit's opening page;

Access	Staged navigational hyperlinks are created for Web exhibits and are provided on each of the institution's home pages. A new exhibit can be accessed directly from the home page. As newer exhibits emerge, they are accessed from a table of contents or menu-like set of links.
	Generalized navigation links, required by the corporate Web page templates,
	also support access to the Web exhibits;
	Web page creators test for accessibility using different Web browsers;
	Provincial Web sites are maintained in French and English;
	Provincial Web sites are required to meet identified standards to support access
	to Web content for people with disabilities.

9. Are those processes and procedures documented? How? In what form?

The processes identified in the response to Question 8 for identifying, retrieving and accessing Web exhibits are not documented. Several of the processes are required by corporate standards or guidelines for practice, but there is no requirement to document the usage of Web page templates or how guidelines to improve access to Web content for people with disabilities are met, for example.

Web site logging software, i.e., software that logs activity on the Web site host server, gathers general information. Logging information is available for all Ontario government Web sites, but different organizations utilize it differently. This is the only source of documentation pertaining to access and retrieval from the user's perspective. The Archives of Ontario utilizes this information to provide summary reports on "hits," "user sessions" and "database activity" (usage of databases accessible via the Web site). There is no breakdown of where the "hits" or "sessions" occur within the Web site, and so it is not possible to determine how active the Web exhibits are. At least part of the reason given for this lack of breakdown is that the Web site components are not well identified; that is, it would be difficult to determine hits and sessions to specific parts of the Web site.

What is documented through the processes identified in response to Question 7 is how to access the source documents that are represented within a Web exhibit. The documentation for this varies, including files created pertaining to the Web site, or links (hyperlinks or through a control number) to databases. The types of databases range from administrative (for the Government Art Collection), to descriptive (the Archives Descriptive Database), to reference (the Visual Database).

10. What measures does the creator take to ensure the quality, reliability and authenticity of the digital entities and their documentation?

Many measures the creator has undertaken to ensure the quality, reliability and authenticity of the Web exhibits and their documentation have already been addressed. These will simply be enumerated below, with any additional measures indicated in detail.

Quality

This is the aspect to which the creator is most attentive. The ongoing consultation over narrative text and images, the research expertise, the care in selection of source documents, and the approvals are all procedural measures undertaken to ensure the quality of the exhibits. The scanning process, exhibit design, and testing of the most common user platforms are technological processes to support exhibit quality.

There are few measures to ensure the quality of the supporting documentation (other than the source records, of course). Recordkeeping throughout the creation process of a Web exhibit is ad hoc and at the discretion of the participating individuals.

*Reliability*⁴⁶

As defined by the Project Terminology group, reliability refers to the record's trustworthiness as a statement of fact. This can be understood in two ways in terms of Web exhibits. It may refer to the factual presentation of the exhibit subject matter. It may also refer to the factual representation of a portion of its records by the hosting institution.

As is clear from the response to Question 6 (above), there is a considerable amount of control exercised over the process by which exhibits are created. This control is inconsistently reflected by supporting records. So, for example, retrieval requests or reproduction orders, perhaps because they are processes independent of Web exhibit creation, provide effective documentation over parts of the exhibit creation process. The research and Web page construction processes, on the other hand, are not consistently documented. The research process may be the one most concerned with the factual presentation of the exhibit subject matter. However, citations and links within the exhibit to archival descriptions and reference codes suggest that it also plays a significant role in the trustworthiness of the exhibit as a factual representation of aspects of the institution's archival holdings.

The form of the record is governed by two factors. The corporate Web page template with its navigation links and identification images (logo, standard ministry names) defines, in considerable detail and including required components, a structure for each page of an exhibit.

⁴⁶ "The trustworthiness of a record as a statement of fact. It exists when a record can stand for the fact it is about, and is established by examining the completeness of the record's form and the amount of control exercised on the process of its creation." *Reliability*, InterPARES 2 Terminology database (accessed 6 February 2004).

The character of the exhibit as a whole, and possibly its completeness, may be defined by its "look and feel" as imparted to it by the exhibit designer, usually the Web site coordinator.

Authenticity⁴⁷

For Web exhibits to be trusted as records, it is critical that their purpose be understood. The response to Question 3 (above) indicates that an exhibit can have more than one purpose. It is also evident that while the identified purposes may not be contradictory, different contributors to a Web exhibit may emphasize different purposes in their contributions.

Because every Web page must display components that tie it to the entire government, Web exhibits must not damage the image of the government. This is true whether it is for the government of the day, or more generally. This requirement is perhaps the most immediate element of accountability that Web exhibits must accommodate. A second accountability element is that the exhibit content, including the representation of the institution's holdings, must be trustworthy, as the exhibits are developed for the general public to access. They must not misrepresent the institution or its holdings, as one of the identified purposes of creating Web exhibits is to entice new patrons to the institution itself.

It is clear that the technical process of scanning source materials for inclusion in exhibits emphasizes that the visual qualities of those source records be maintained as far as is consistent with representing the image on a computer screen. For example, an image of a large painting will often be shown much smaller than the original, because if it were the actual size then only part of the image would be visible on the computer screen at one time and the viewer would need to scroll around to see the whole image. In this way aspects of authenticity are incorporated into exhibit components. A technological process not explored in this case study that addresses aspects of the integrity of the exhibits is the maintenance of a secure environment. Exhibits are located behind the corporate firewall and access to the institutional Web sites themselves in their entirety on the development and production servers is limited.

11. Does the creator think that the authenticity of his digital entities is assured, and if so, why?

In technological terms, the creating institutions perceive no significant threat to the authenticity of the Web exhibits. At the Archives of Ontario, the Web site coordinator is the only person with administrative access to the Web site components on the production server, which hosts the Archives' Web site on equipment maintained by another office external to the Archives. The private company that maintains the Archives' databases also has access to the Web site. Beyond these groups there is no one with administrative access to the Web site components. Except in terms of individual administrative access privileges to the Web site components, there are no technological security procedures in place within the creating institution.

Because the Government's legal and security interests are caught up in the Web environment, protection standards and guidelines for Web site development have been created.⁴⁸ These

⁴⁷ "The trustworthiness of a record as a record." *Authenticity*, InterPARES 2 Terminology database (accessed 6 February 2004).

⁴⁸ See GO-ITS 23.1, Purpose statement:

standards define requirements in the areas of corporate identity, copyright and authorization for ministries implementing applications for public access to government information through the Internet World Wide Web, and include:

- 1. Mandatory requirements for ministries and agencies;
- 2. Guidelines outlining directions that should be followed unless there are compelling reasons not to; and
- 3. Preferred practices to better help ministries and agencies position themselves for the future.

The objectives of the standard are:

- 1. To ensure a consistent public interface to the government;
- 2. To define quality standards;
- 3. To avoid the costs of duplicated effort; and
- 4. To protect the government's legal and security interests.

In conceptual terms, contributors to a completed Web exhibit generally indicated that their processes of exhibit creation assured the authenticity of the final record. In relation to the representation of records in exhibits, the curator of the Government Art Collection exhibit commented that viewers are considered to be sophisticated enough to understand the limitations of the [computer] medium, of what they're seeing on screen. And we do provide the medium of the work [and] the size...I think that's an accepted part of the limitation of what you're seeing on the screen. And if you're interested in the work, you can always come and see it.⁴⁹ She added that, in her own experience as an art history student, "90% of what you see is on a slide on a screen in a seminar room."

The War of 1812 exhibit, not yet mounted on the Web site, will include an introductory section on the creation of the exhibit. This will outline the process by which documents and images were selected. This section was thought necessary because the images are not contemporary to the war.

12. How does the creator use the digital entities under examination?

The creators use Web exhibits for promotional purposes within their own institutions, throughout their larger corporate environments, and within the general public. Promotion to the public is general but also contains specific focuses, such as having educational sites include links to the exhibits. Comments were made that Web exhibits can be superior to physical exhibits because with the former there are fewer restrictions on accessing and interacting. One interviewee noted that Web exhibits extend the business of the archives outside the confines of the physical walls.

Web exhibits are also used as a means to increase access to the holdings of the archives through citations that link the exhibit narrative to bodies of records held by the Archives. Unlike more conventional representations of records through traditional archival finding aids, an interviewee

⁴⁹ Interviewee 56A, response to question 28b.
commented that creating a Web exhibit requires the curator to not simply reflect what the records are, but to use the records and make something from them.⁵⁰

In the opinion of another, Web exhibits are not just used to highlight archival holdings, but serve the long-term goal as well of being a basis for "distance archives" and "distance education."⁵¹

It is curious to juxtapose the statements above with the comment from managers and Web site coordinators that although Web site statistics are captured each month, they "haven't been broken down for the exhibits. Too complex."⁵²

13. How are changes to the digital entities made and recorded?

A few interviewees did not know if changes were ever made to exhibits once they were on the production site. Most, however, acknowledged that changes were made and of these unanimously noted that the changes were undocumented. This may be an oversimplification, as the following types of changes were described:

- reformatting early exhibits "to bring them up to the current look and feel"⁵³
- minimal changes: typographical corrections, correcting a reversed image
- planned changes (e.g., promoting an art competition has outcome announcement or • activating a link)

It is likely that where there were minor corrections, e.g., typographical errors, there would be no documentation. The consultative nature of the processes by which exhibits are created suggests that there would be at least some supporting documentation of planned changes. It is possible that while such intended changes are documented, there may be no evidence as to when (or if) those planned changes were ever made.

There was no indication of any documentation around the reformatting of older exhibits to bring them up to current standards. It was the opinion of one interviewee that recording changes to exhibits was important for audit purposes: "You have to document why you have decided to make those changes."54

The Web sites are periodically captured. It was thought by one interviewee that changes might be detectable by comparing pages from different "captures."⁵⁵

⁵⁰ Interviewee 56P, response to question 32.

⁵¹ Interviewee 36P, response to question 5. ⁵² Interviewee 106P, response to question 19.

⁵³ Interviewee 36A, response to question 10b.

⁵⁴ Interviewee 56P, in response to question 23.

⁵⁵ Interviewee 106P, in response to question 23.

Supplement to Question 13⁵⁶

Ontario government staff responsible for the government's internet (i.e., public) Web sites were instructed to "freeze" Web content when the provincial election was called in 2003. This meant that no changes were to be made to government Web sites. Following the change of government in October 2003, changes to all government Web sites were required. A memo dated 10 June 2003 from the Office of the Corporate Chief Information Officer instructs Chief Administrative Officers, Chief Information Officers, and Communications Directors to

carefully review the material on their Web sites and adopt a phased approach to content changes once the "freeze" is lifted. One approach is to begin by identifying material containing messaging that can be stripped from your sites while maintaining factual information. Identify materials such as press releases, speeches, fact sheets, introductory paragraphs and similar types of information on your respective sites. We will discuss options with you on how to treat these materials regarding public access.

A supplementary memo, dated 21 October 2003 from Richard McKinnell, directs government Communications Directors to

proceed with work to ensure that priority items are updated on your Web sites to go live on October 23, 2003 [date of government transition]. This would include the archiving of information relating to the outgoing government, the removal of outdated information and the posting of your new minister's picture and biography.

The accompanying guideline to McKinnell's memo suggests that Web content be edited: "Ministries should update that information on Web sites, as required, to reflect the change in government." The instructions do not at any point indicate a requirement that a record of changes made be created, with the exception that prior to making changes a backup copy of the Web site should be made.

The following describes how these requirements affected the exhibits on the Archives of Ontario Web site. Superficial changes required changing the main color bar on government Web sites from blue to a red-brown. A substantial change was made to the "A Celebration of Ontario Artists" exhibit, created for an art competition sponsored by the Archives of Ontario. The competition concluded prior to the election and, following the transfer of government, the picture of the former minister's participation in the competition was removed from the exhibit. This exhibit has since been further modified and now only refers to the fact that a competition was held. There is no longer any statement or evidence of ministerial involvement in the exhibit. Figure 5 shows the opening page of the exhibit prior to the election (July 2003). Figure 6 shows the opening page as it existed in June 2004.

⁵⁶ This supplement describes changes to Web exhibits at the Archives of Ontario that occurred during the period following the interviews to the completion of this report. It was completed by Jim Suderman on 18 June 2004.







Figure 6. Ontario Artists exhibit opening page, June 2004

A second change, unrelated to the first, that has occurred is that one of the earliest exhibits, "Preserving Black History – The Alvin D. McCurdy Collection," has been substantially altered and is now called "Black History in Ontario. The End of Slavery." Figure 7 below illustrates the first page of the original version of the exhibit. Figure 8 illustrates the first page of the current version.



Figure 7. Black History opening page, December 2003

Figure 8. Black History opening page, July 2004

The reasons cited by the Web site coordinator for the changes included a very different look and feel from current exhibits, a broader topical focus, and a much improved quality of images used in the current version of the exhibit.

These reasons could indicate qualities of accuracy, reliability or authenticity—certainly the improved image quality suggests this—about these exhibits as records.

The change in exhibit title and content focus might also suggest that the earlier exhibit was retired, i.e., reached its inactive state, and the later exhibit is in fact a new exhibit, although dealing with similar subject matter.

If it is considered that the earlier exhibit reached the inactive state of its existence as a record, then the reasons provided may suggest criteria for determining the stages of the lifecycle for this type of record.

The older version of the exhibit is no longer available via the Web site (i.e., on the production server), although it is retained on the development server and on monthly CD-R copies of the development server.

14. Do external users have access to the digital entities in question? If so, how, and what kind of uses do they make of the entities?

Web exhibits are created specifically for external users to access. External users would not normally have access to documentation, electronic or otherwise, supporting the development and maintenance of Web exhibits. Furthermore they would not have access to the production server except through their Web browser. This means that the components of the Web exhibits would not be individually accessible to them and that however the exhibit is used, it is used as a single entity.

Neither of the creating organizations is undertaking any specific study or survey of usage of Web exhibits. However emails (via "feedback forms") and generalized Web site statistics indicate an ever-growing use of the Web sites in general, presumably including the exhibits.

Anecdotal information indicates that some exhibits are being used as reference materials in courses up to the university level, although the two such exhibits so named are not among the three that are the specific focus of this study. Feedback from the first Eaton's exhibit The Archives of Ontario Remembers an Eaton's Christmas was "dramatic. We got far more than we anticipated."57 At one institution the email "feedback form" was removed from the exhibit because of the volume of research requests that were coming through that avenue.⁵⁸

Survey results from a recent study of Web site users of art museum Web sites indicated that about 25% of users were researching information on specific content, 32% were interested in specific information about the creating institution, 12% were looking for fun activities, and only 2.4% were interested in shopping. Results also indicated that for 39% of users, "actually getting the information they wanted" was the most engaging part of the experience.⁵⁹ Another study in connection with Web exhibits at the National Archives of Singapore reported that 87% of survey respondents felt that Web exhibits have considerable educational value.⁶⁰

Supplement to Question 14⁶¹

An informal examination of Web usage was undertaken at the Archives of Ontario using the statistics gathered from Web logs dating February to May 2004, inclusive. Of an approximate total of 8,933,430 hits on the Archives' Web site, just over one guarter, 2,372,147, were on the Web exhibits.

⁵⁷ Interviewee 106P, in response to question 7.

⁵⁸ Interviewee 17 Feb, in response to questions 31.

⁵⁹ John Vergo, Clare-Marie Karat, John Karat, Claudio Pinhanez, Renee Arora, Thomas Cofino, Doug Riecken, Mark Podlaseck Less Clicking, More Watching": Results from the User-Centered Design of a Multi-Institutional Web Site for Art and Culture "Web site Survey Results" section. Available at http://www.archimuse.com/mw2001/papers/vergo/vergo.html (accessed 10 February 2004).

⁶⁰ Leong Chee Khoon, Chennupati K. Ramaiah and Schubert Foo, The Design and Development of an Online Exhibition for Heritage Information Awareness "Requirements Gathering" section. Available at

http://www.archimuse.com/mw2002/papers/ramaiah/ramaiah.html (accessed 10 February 2004). ⁶¹ This supplement describes changes to Web exhibits at the Archives of Ontario which occurred during the period following the interviews to the completion of this report. It was completed by Jim Suderman on 18 June 2004.

15. Are there specific job competencies (or responsibilities) with respect to the creation, maintenance, and/or use of the digital entities? If yes, what are they?

Specific job competencies are listed here in relation to the three general processes outlined in question 6 above. These are primarily relevant to the creation of Web exhibits, although knowledge of technological standards supports their maintenance as well. There are no competencies identified for the use of the digital entities. Some general comments from reference documents or published sources follow.

Research

- writing;
- text editing;
- quality assurance (especially effective research skills);
- creativity.

Administrative

- adequate resources must be allocated;
- flexibility (to support creativity in the research process);
- sensitivity to what is appropriate.

Technological

- design skills;
- knowledge of technological standards (e.g., HTML);
- knowledge of software (applications listed by interviewees include Photoshop, Dreamweaver MX, Fireworks, Flash, Final Cut Pro, Cleaner, Excel, Page Maker);
- knowledge of corporate requirements.

Kalfatovic identifies the following positions that will be involved with an on-line exhibition:

- Archive director (responsible to approve concepts, resources);
- Curator (responsible for displaying objects in coherent and informative or educational ways);
- Designer (responsible for knowing tools and practices for good Web design, ability to take a design through development, ability to conceptualize a design based on the exhibition idea);
- Technical staff (responsible for scanning, Web page creation, etc.);
- Conservator (responsible for preparing materials for scanning or photography):
- Editor (responsible for grammar, effective writing styles, and clarity of text, as well as (possibly) copyright compliance, translation);
- Education consultant (responsible for related or supplemental products such as lesson plans for teachers or specific reading lists).⁶²

Relevant to the maintenance of Web sites generally, the Ontario internal administration defines three roles:

- Manager (overall responsibility for the content and maintenance of the Web site);
- Content contact (responsible for coordinating content and handling content-related inquiries);

⁶² Martin R. Kalfatovic, p. 39.

• Technical contact (responsible for technical development and answering technical inquiries).⁶³

16. Are the access rights (to objects and/or systems) connected to the job competence of the responsible person? If yes, what are they?

The InterPARES Terminology database defines a *digital object* as "[a] unit of digital information that includes properties of the object and may also include methods of performing operations on the object." Thus, for the purposes of this study, objects include the Web exhibits, including their components, source records, and documentation supporting exhibit creation and maintenance. The InterPARES Terminology database defines a *digital system* as "[a]ny system handling binary data, as opposed to an analogue system." More specifically within the context of records management, a *system* can be conceptualized of a as a set of rules governing the management of records and the tools and mechanisms used to implement these rules.⁶⁴ Thus, for the purposes of this study, systems refer to the technological (hardware and software) platform that supports the Web sites, and therefore the exhibits, as well as the rules (policies and procedures) governing the management of the technological platform and the exhibits, including access rights.

Access rights are connected to the competence of the participating individuals. Web site coordinators and managers have access to the Web development server system. Only the Web site coordinator has access to the Web production server system. Exhibit curators have access to the development server system on an as needed basis, i.e., while the exhibit they are curating is in development. Outside the creating institutions, a limited number of other staff have access to the production system for maintaining security.

Because recordkeeping is not centralized (except for paper records in one of the two institutions), access to most supporting documentation is effectively connected to the job competence of the participating individuals. Conceptually, a manager should be able to access electronic files of institutional staff, but the technology is not deployed this way in terms of access rights, i.e., individuals are assigned exclusive storage space. As needed, managers can instruct IT support staff to bypass the normal access permissions. Similarly, where scanned images are created to populate a visual database, the scanning technician has sole access to the master images. The general public, through the Web-based interface to the visual database, may also individually access derivative images used as exhibit components.

⁶³ GO Web Committee intranet site, "Add or Update Site Listing" page, available at <u>http://Webmaster.gov.on.ca/cts/add_update.htm</u> (accessed 10 February 2004).

⁶⁴ For example, a "recordkeeping system" is defined in the InterPARES Terminology database as "A set of rules governing the capture and storage of records and/or information about records and the tools and mechanisms used to implement these rules." Likewise, a "preservation system" is defined as "The preservation rules and procedures, preservation strategies, and preservation technological requirements within the permanent preservation system, together with the tools and mechanisms needed to effect preservation of records" (database accessed 8 July 2006).

17. Among its digital entities, which ones does the creator consider to be records and why?

This study has examined the activity of creating Web exhibits. The study has made it clear that existing institutional activities are drawn upon in the course of creating Web exhibits. The digital entities that result from those other activities are not considered in this question. In effect, this question therefore becomes "Does the creator consider Web exhibits to be records and why?" and "Are documents supporting the development and maintenance of Web exhibits records?"

Most interviewees indicated that Web exhibits were business records of the creating institution. Reasons given included their unique characteristics (usually expressed in terms of interactivity or flexibility to the user and the hyperlinked relationships to other records); their relationship to the mandate and outreach function of the creating archival institutions; and their support of institutional operations (e.g., reference services). Perhaps the most interesting comment, with reference to a records lifecycle, was that source records presented digitally in a Web exhibit are brought to life.⁶⁵

The two interviewees who unequivocally thought that Web exhibits were not business records of their creating institutions were, surprisingly, the Web site coordinators, i.e., the individuals most immediately concerned with the production of the exhibits. In one institution, the scanning technician was not sure whether exhibits formed business records or not, but went on to observe that the institution sells copies of images, which may be found within exhibits.

Documents created in the development and maintenance of Web exhibits were generally considered to be records because this documentation was considered evidence of the development of Web exhibits. Even those interviewees who felt that the exhibits themselves were not records maintained that documents created in the process of creating Web exhibits were records.

Human resource records, accounting records, and archival finding aids were identified as illustrative examples of business records of the institution. Responses would likely have differed had the interviewees been asked if Web exhibits were like archival records, i.e., those collected rather than created by the institution.

18. Does the creator keep the digital entities that are currently being examined? That is, are these digital entities part of a recordkeeping system? If so, what are its features?

The creators do keep Web exhibits. In neither institution are they kept in a recordkeeping system as defined by the InterPARES Project.⁶⁶ Web exhibits are kept active in the larger environment of the institution's Web environment. Components of Web exhibits are stored in various places, with the only complete source being in the development server and ultimately the production

⁶⁵ Interviewee 106P, in response to question 29.

⁶⁶ The definition of "recordkeeping system" in the Project's Terminology database is "A set of internally consistent rules governing the making, receiving, setting aside, and handling of active and semi-active records and the intellectual and physical maintenance of semi-active and inactive records by the records creator, and the tools and mechanisms used to implement those rules" (database accessed 11 February 2004).

server. Supporting records are not centrally stored, but rather in relation to the various individuals through their roles in Web exhibit development and maintenance.

At the Archives of Ontario, an "Exhibit Approval Form"⁶⁷ requires staff to "save all final work on the P:Drive under Anniversary/Exhibits."⁶⁸ No written policies or procedures were provided concerning the preservation of Web exhibits. Of the twelve exhibits posted since the beginning of 2003, only one file has been saved to the P: drive (a common access area stored on a file, as opposed to a Web, server) and it is for an exhibit that has not yet been posted to the Web site.⁶⁹

By looking at the Web site as a recordkeeping environment for the exhibits themselves it is clear that there is no lifecycle to exhibits, at least none has yet emerged. This may be due to the emerging nature of the exhibit activity itself within the creating institutions. It may also be due to the absence of legal or other evidential requirements that define the lifecycle for more conventional records. The value basis for open content suggested by Cedergren (related in the introduction to Section C of this report, above) may also indicate a reason for the apparent absence of a conventional records lifecycle for Web exhibits.

In terms of "rules governing the making, receiving, setting aside, and handling of active and semi-active records," the rules governing the development server determine how a Web exhibit is made. The rules governing the production server preclude exhibit creation, but this server can "receive" a complete exhibit (record) from the development server. To date no exhibits have been set aside.

In neither institution are Web exhibits governed by a records retention authority. At the Archives of Ontario, the entire Web site is copied to removeable media (CD-R, DVD-R) on roughly a monthly schedule. However, what is usually copied are the contents of the development server, which may contain files (e.g., drafts) that were never forwarded to the production environment, i.e., the live Web site.

Exhibit components and records supporting the creation and maintenance of Web exhibits also are kept, but not within one recordkeeping system. Supporting records are, generally speaking, maintained in a manner consistent with the roles of each participant in the development of exhibits.

18a. Do the recordkeeping system(s) (or processes) routinely capture all digital entities within the scope of the activity it covers?

Taking the view that the Web site is the recordkeeping "system" it can be asserted that it captures all exhibits and the components of which they are made. It does not capture any supporting documentation emerging from the research or administrative processes (as defined above).

⁶⁷ This form was launched on 2 December 2002.

⁶⁸ The "P: drive" is a common or shared on-line storage area. All staff have viewing privileges to documents on this drive. Only a few staff can create, modify or delete documents on this drive, and most of these staff are limited to specific folders pertinent to their roles within the institution.

⁶⁹ It is the definition document pertaining to *The War of 1812* exhibit. As of 11 February 2004 it has not been posted to the Archives' Web site.

The recordkeeping process described in one institution in the Exhibit Approval Form has evidently not been followed. Interviewee comments confirm that recordkeeping of supporting documentation is done individually in terms of what is created and captured, how and where it is filed. One interviewee described a (paper) file containing the original text, listing of images, and a print out of the entire Web exhibit complete with images.⁷⁰

18b. From what applications do the recordkeeping system(s) inherit or capture the digital entities and the related metadata (e.g. e-mail, tracking systems, workflow systems, office systems, databases, etc.)?

The exhibits are created using DreamWeaver and Page Maker software applications. Neither of the Web coordinators made reference to adding elements beyond the defaults of these applications to the document properties. Web site log statistics are gathered using Analog, version 5.31,⁷¹ by Corporate Internet Hosting Services (CIHS) and deleted after 90 days.

Applications used to create supporting documentation include Microsoft Word, Outlook (email), and PowerPoint. Metadata captured would normally be what is automatically captured by the default settings of those applications. None of the interviewees commented that they used the document properties function to add any specific metadata.

18c. Are the digital entities organized in a way that reflects the creation processes? What is the schema, if any, for organising the digital entities?

The entire body of exhibits on the institution's Web site are organized in chronological order (by date of posting). Each exhibit is organized internally in a way that reflects the creation process, an essentially conceptual process. The narrative is reflected in the "chapters" or Web pages comprising the exhibit. The exhibit components are conventionally organized with each Web page appearing in the root folder, with common sub-folders for image, sound, or moving image files, i.e., one sub-folder will contain all images for a particular exhibit. There is no evidence within a file manager of which image components, for example, are linked to which Web pages.

The scanning technician at one institution organized the supporting documentation he maintained by curator's name, then by exhibit. Within each exhibit sub-folder would reside copies of the images prepared (not necessarily used) for that exhibit.⁷² The manager at the other institution commented, "file naming conventions have been somewhat erratic."⁷³ Comments by other interviewees made in passing throughout the interviews suggest that organization of supporting documentation is idiosyncratic.

⁷⁰ Interviewee 56A, in response to question 18.

 ⁷¹ See <u>http://www.analog.cx/</u> for further information about Analog (accessed 12 February 2004).
 ⁷² Interviewee 106A, in response to question 18.

⁷³ Interviewee 18 Feb, in response to question 22 (CD 2, Track 4).

18d. Does the recordkeeping system provide ready access to all relevant digital entities and related metadata?

Certainly, the Web site provides ready access to all Web exhibits. The absence of a recordkeeping system and lack of consistent recordkeeping processes around the provision of access to Web exhibits within the two institutions means that related metadata are not readily accessible, even if they have been captured.

18e. Does the recordkeeping system document all actions/ transactions that take place in the system re: the digital entities? If so, what are the metadata captured?

The Web logging software documents aspects of all interactions with the institution's Web site. There are twenty-one reports generated by Analog based on the data it gathers. These are made available to the creating institutions, and include:

- 1. A general summary containing overall statistics;
- 2. A weekly report listing activity (i.e., "requests for pages") for each week;
- 3. A daily report listing activity (in terms of "requests for pages") for each day;
- 4. An hourly report listing activity (in terms of "requests for pages") for each hour;
- 5. A daily summary showing total activity for each day of the week;
- 6. An hourly summary showing total activity for each hour of each day;
- 7. A domain report summarizing the countries of computers that requested files;
- 8. An organization report summarizing the organizations (in terms of internet service providers, e.g., sympatico.ca) of computers that requested files;
- 9. A host report listing the computers that requested files;
- 10. A redirected referrer report listing the referrers that caused redirected requests;
- 11. A failed referrer report listing the referrers containing broken links to the site;
- 12. A referrer report listing the referrers (where people followed links from, or pages that included this site's images);
- 13. A referring site report listing which servers people followed links from;
- 14. A browser report listing the browsers used by visitors;
- 15. An operating system report listing the operating systems used by visitors;
- 16. A status code report listing the HTTP status codes of all requests;
- 17. A file size report listing the sizes of files;
- 18. A file type report listing the extensions of files;
- 19. A directory report listing the directories from which files were requested (figures for each directory include all of its subdirectories);
- 20. A redirection report listing the files that caused requests to be redirected to another file (i.e., usually directories with the final slash missing, or CGI scripts that forced redirections);
- 21. A failure report listing the files that caused failures (e.g., files not found); and
- 22. A request report listing the files on the site.

Changes to Web exhibits may be made by the creator without consistent, or even any, documentation.

19. How does the creator maintain its digital entities through technological change?

Currently all Web exhibits are maintained on the active Web site. Both institutions have updated some of their older exhibits, one from as early as 1996 or 1997. In neither institution are there formal or informal policies for preservation of the exhibits through technological change.

19a. What preservation strategies and/or methods are implemented and how?

Although there are no preservation strategies in place, there are practices in use that would almost certainly become components if a preservation strategy were developed and implemented. Web exhibits are coded so that they remain compatible with older browsers developed before the current version of HTML. Also, HTML coding is done in such a way that the exhibits will present properly on the widest range of user platforms. The widespread use of HTML and the backwards compatible approach taken would provide a flexible basis for making preservation choices over the long-term. Related to this is the decision to use basic, rather than the most advanced, components in the make-up of the exhibit. Using basic components will minimize preservation requirements, e.g., around migration or emulation, for the long-term preservation of Web exhibits.

19b. Are these strategies or methods determined by the type of digital entities (in a technical sense) or by other criteria? If the latter, what criteria?

Using HTML to maximize backward compatibility and optimize proper presentation of the Web exhibits on the widest possible range of user platforms is an approach that is determined by the kind of entity that Web exhibits are. This method does not support any of the supporting documentation, for example, or capture any particular associated metadata.

20. To what extent do policies, procedures, and standards currently control records creation, maintenance, preservation and use in the context of the creator's activity? Do these policies, procedures, and standards need to be modified or augmented?

Some policies, procedures, and standards exist that currently control aspects of Web exhibit creation, maintenance, preservation and use in the creating institution's context. The Ontario government has developed a standard look and feel to which all government Web content must adhere. These are standards created or adopted within the Ontario Public Service. They primarily affect creation and include:

- *Internet Public Access Product Design* (GO-ITS 23.1) This standard has ten mandatory requirements for:
 - Identification of Web sites/corporate identity;
 - Copyright;
 - Publishing;
 - Timeliness features;
 - Naming conventions (i.e., for URL's);
 - Use of multi-media;

- Accessibility (among other things this requires conformity with Priority 1 and Priority 2 Web content accessibility guidelines of the W3C);
- Usability requirements;
- Metadata (refers to title, keyword, description and classification meta tags); and
 Reporting.

In addition to these there are six guidelines, i.e., practices that should be followed, and seven "preferred" practices, i.e., that are recommended to be followed. These guidelines and practices are not listed here.

- *World Wide Web Content Standard* (GO-ITS 23.2)
- Internet Web Application Interface (GO-ITS 23.3)
- Government of Ontario Internet Style Guide (July 1999);
- Visual Identity

These standards have been established to provide a common "look and feel" for all Web sites within the government's domain: every page is to display properly on a 640 x 480 pixel monitor; a consistent series of navigational links is to appear on every page; a "feedback form" is always available, etc. They have also been established to create and maintain a secure Web environment.

On the same Web page, reference is made to W3C specifications, guidelines, software and tools, with specific mention of:

- HTML specifications;
- Cascading Style Sheets specifications; and
- Web Accessibility guidelines (Web Accessibility Initiative WAI).

These guidelines and specifications are standards⁷⁴ within the Ontario government because they are specifically designated as such within the GO-IT Standards.

There are no internal, i.e., to the Archives of Ontario, policies governing creation, storage, or access to Web exhibits. Unwritten but generally understood standards and procedures include:

- an academic style for developing exhibit narratives and citing source documents referred to or used in exhibits;
- finalization, including inspection and authorization, of Web exhibits before they are copied to the production server;
- the use of metric measurements and consistent image labeling;
- striving towards "a certain level of accuracy and presentation. We're always concerned about how, for instance, images look and that we've done the best we can to present them as faithful to the originals as we can, within the limitations of the technology"⁷⁵;
- the taking of monthly "snapshots" of the Web site as a whole;
- scanning all images at a resolution of 600 pixels per inch; and
- policies for color balance, image density, and dealing with flaws in the source records.

⁷⁴ Interviewee 36A, in response to question 10a, drew a distinction between standards and policies. "…we've just kind of developed a way of working, I guess…we have standards, but I don't think I'd use the word policy particularly. That formalizes it."

⁷⁵ Interviewee 56A, in response to question 12.

The *Management of Recorded Information Directive*,⁷⁶ the existing Ontario Government recordkeeping policy, is not adhered to, e.g., Web exhibits are not governed by a records retention schedule. Other than corporate recordkeeping policy, the previously identified policies, standards and procedures appear to be consistently applied.

There was no consensus among the interviewees as to whether there were plans in place to modify or augment policies. Some interviewees indicated that there were no such plans in place; others indicated that there were. In one instance an interviewee asserted that "some guidelines are being put together. I guess they're probably almost in final draft form now about exhibits in general, both physical and Web."⁷⁷ The interviewee emphasized that these would be guidelines, rather than policies. One interviewee expected that additional policies and procedures would emerge as the scanning program was increased to accommodate maps and architectural drawings. And some others saw a need for augmenting or modifying policies and procedures, but did not necessarily foresee when this might occur.

21. What legal, moral (e.g., control over artistic expression) or ethical obligations, concerns or issues exist regarding the creation, maintenance, preservation and use of the records in the context of the creator's activity?

Moral and ethical obligations or issues were frequently lumped together by the interviewees in their responses. The following is an attempt to separate them, based on a definition of "moral" as "of or relating to principles of right and wrong; conforming to a standard of right behaviour," and "ethical" as "conforming to accepted and especially professional standards of conduct."⁷⁸

An interesting moral issue identified by an interviewee was the selection of "what records and what portions of records to present."⁷⁹ S/he went on to observe that because a public institution maintains the exhibit, "nothing [is] going to make it to the Web site that's particularly controversial." Two other interviewees also considered the moral aspects of selection. The first thought selection of exhibit materials in the institutional environment might be thought of as a form of censorship, asking "Are we displaying the cultural diversity of the community when we make topic decisions?"⁸⁰ The second did not consider it an issue of self-censorship, but rather an avoidance of "controversial issues where living people are going to be affected by it."⁸¹

Providing accurate content was identified as a moral concern. Where it was defined, accuracy seemed to relate most to presentation of correct, factual information. One interviewee commented that because people are using the exhibits for many different purposes, viewers should be "able to use [the exhibit] believing it is the authoritative text."⁸² Another interviewee

⁷⁶ Details of the *Management of Recorded Information Directive* are provided in Section C, b), above.

⁷⁷ Interviewee 36A, in response to question 12.

⁷⁸ The Merriam-Webster dictionary, 1974.

⁷⁹ Interviewee 36A, in response to question 32.

⁸⁰ Interviewee 56P, in response to question 32.

⁸¹ Interviewee 36P, in response to question 32.

⁸² Interviewee 106P, in response to question 32.

felt that accuracy was achieved through transparency, "always pointing out our motivations, intentions and choices"⁸³ in the selection of exhibit content.

Ethical issues identified pertained to accessibility: who would be excluded by the technology used to make Web exhibits available, and what were the responsibilities to people with disabilities (i.e., this was not seen as a purely legal responsibility). Delivery of exhibit content "in a way that is not insulting or can create bad feelings" was another ethical concern, linked to accuracy of content. One interviewee observed that simply delivering content via the Web fulfilled an ethical obligation of public archives to make their holdings accessible.⁸⁴ Confirming the authenticity of information and content was identified as an ethical concern by one interviewee, but s/he did not define authenticity.⁸⁵ In the context of this interview the term seems to have been understood to mean a clearly established relationship of exhibit content to the source records, perhaps on the assumption that the archival source records were themselves authentic.

Legal issues identified by the interviewees included:

- honoring copyright in using source records;
- honoring individual privacy;
- abiding by the provisions of the *French Language Services Act* (Ontario government only); and
- honoring the requirements of contracts governing source records donated to the institution.

One ethical concern related was that where copyright status of source materials was not clear it was a matter of good public relations to request the donor's permission to use the materials.⁸⁶

All the issues identified above relate to each other in the context of the creation or use of Web exhibits. It is probably fair to say that interviewees expected that Web exhibits created in a certain way would be maintained in that way, but as is evident in the responses to question 19 (above), there has been little consideration of the preservation of Web exhibits.

22. What descriptive or other metadata schema or standards are currently being used in the creation, maintenance, use and preservation of the recordkeeping system or environment being studied?

InterPARES 2 defines metadata as: 1) Data that describes other data. Data dictionaries and repositories are examples of meta-data; 2) Any file or database that holds information about a document, record, aggregation of records or another database's structure, attributes, processing or changes.⁸⁷ The response to this question should be read in conjunction with the response to question 18 above.

⁸³ Interviewee 56P, in response to question 32.

⁸⁴ Interviewee 17 Feb, in response to question 32.

⁸⁵ Interviewee 18 Feb, in response to question 29.

⁸⁶ Interviewee 36P, in response to question 10a.

⁸⁷ InterPARES 2 Terminology database (accessed 16 February 2004).

The Government of Ontario identifies "Category Metadata" a standard for Government of Ontario Web sites, providing examples and links to: 1) a listing of twenty-nine categories;⁸⁸ 2) a listing of keywords;⁸⁹ and 3) a guide entitled *Using and Maintaining Category and Keyword Lists*. Because of his unfamiliarity with meta tags, the Archives of Ontario's Web site coordinator initially ignored the standard, but has now retroactively applied meta tags to Web pages. However, since major Web search engines such as Google and Yahoo "don't look at meta tags" but rather at the actual page contents, meta tags are not applied except to "key pages."⁹⁰ There is nothing that distinguishes an exhibit page from any other page on the Web site. The Web coordinator for the City Archives stated that he determines the meta tags he uses.

Scanned images are identified by a unique reference number when they are entered into the Archives of Ontario's Visual Database. Technical data fields used in the Visual Database include: Reference Code, Image file, Box No., Data of scan, Colour, Scanned setting, Unsharp mask? [if yes, then the following fields are completed: Amt, Rad, Thres], Resolution, Size of original, Levels, Image size, and Actions (see Appendix 3 for screen shot showing fields). Exhibit components are linked to source records via the archival descriptions. In the *Government of Ontario Art Collection* exhibit, artworks are cited in the same way as would the actual works:

For example, if you've just got four lines, then you usually either put the title of the work first or the artist, followed by the date, and then you put the medium, comma, size and the collection. That's a very standard way of describing a work of art in a citation.⁹¹

A tracking database is also maintained for the art collection. Database elements include artist name, title of the work, accession number, and location.

The only comprehensive source of metadata governing the entirety of an exhibit appears to be the "definition document" created for *The War of 1812* exhibit. This document includes the title, reference code, image number (where applicable), location information, and a summary of the document/image.

23. What is the source of these descriptive or other metadata schema or standards (institutional convention, professional body, international standard, individual practice, etc.?)

There is no identified source for the Government of Ontario Category Metadata rules. The City's Web coordinator stated that the meta tags he uses do not conform to any standards.

Both institutions maintain databases of archival description. In these databases, the Canadian *Rules for Archival Description* is the standard for description. The definition document created

⁸⁸ <u>http://Webmaster.gov.on.ca/GO_Docs/categori.doc</u> (intranet site) (accessed 16 February 2004).

⁸⁹ <u>http://Webmaster.gov.on.ca/GO_Docs/Keywords.doc (intranet site)</u> (accessed 16 February 2004). Keyword entries include scope notes, synonyms, broad terms, narrow terms, related terms in English and French.

⁹⁰ Interviewee 36A, in response to question 25b.

⁹¹ Interviewee 56A, in response to question 26.

for *The War of 1812* exhibit is the result of individual practice. Government artworks follow professional practices of labeling. A database of artworks that links each art work to a file containing details of each work's provenance and conservation history is maintained by the Government art collection curator. No source is identified for the tracking metadata in the art collection database.

E. Addressing the Domain and Cross-Domain Research Questions

In this section, responses are sketched to selected Domain and Cross-domain questions from the InterPARES 2 research proposal document. Domain and Cross-domain questions that are not addressed here are those where the case study findings did not seem relevant.

Domain 1 (Record creation)

What are the formal elements and attributes of the documents generated by these processes in both a traditional and a digital environment? What is the function of each element and the significance of each attribute? Specifically, what is the manifestation of authorship in the records of each activity and its implications for the exercise of intellectual property rights and the attribution of responsibilities?

Elements and attributes, including their function and significance, are addressed in Section D, question 4.a. Authorship is manifested through URLs that indicate the corporate domain. For example, the "gov.on.ca" in the following URL indicates that the site resides in the domain of the Government of Ontario, Canada: <u>http://www.archives.gov.on.ca/english/exhibits/index.html</u>. Authorship also is indicated through primarily visual cues such as the Government of Ontario and City of Toronto logos, and navigation paths and bars, all of which are required by the Web page template in use within each jurisdiction. In both Web domains, copyright is claimed by the jurisdiction as a textual component of the Web page template.

Does the definition of a record adopted by InterPARES 1 apply to all or part of the documents generated by these processes? If yes, given the different manifestations of the record's nature in such documents, how do we recognize and demonstrate the necessary components that the definition identifies? If not, is it possible to change the definition maintaining theoretical consistency in the identification of documents as records across the spectrum of human activities? In other words, should we be looking at other factors that make of a document a record than those that diplomatics and archival science have considered so far?

The InterPARES 1 Glossary defines "record" as "a document made or received and set aside in the course of a practical activity."⁹² Although this definition does apply to Web exhibit documents, its simplicity may mask aspects of the way the technology allows 'creation' and 'setting aside' to be decentralized. The impact of the technology on the record can be considered to be part of the record's "identifiable context," as the record is inextricably tied to technical aspects of the technology of the medium. For example, a Web exhibit as a record would be difficult to comprehend if not in a Web-like environment, but the creator of the record does not create the World Wide Web (although in the context of this case study it does participate in the

⁹² The Authenticity Task Force Report expands this definition, stating that "an electronic record, like its

traditional counterpart, is a complex of elements and their relationships. It possesses a number of identifiable characteristics, including a fixed documentary form, a stable content, an archival bond with other records either inside or outside the system, and an identifiable context. It participates in or supports an action, either procedurally or as part of the decision-making process (meaning its creation may be mandatory or discretionary), and at least three persons (author, writer, and addressee) are involved in its creation (although these three conceptual persons may in fact be only one physical or juridical person)."

creation of the "Web space" in which Web exhibits are maintained). Recognition and demonstration of the record must therefore take into account how the technology assembles the digital components manifesting the record.

Domain 2 (Concepts of authenticity, accuracy, reliability)

What does record accuracy mean in the context of each activity? To what extent can the electronic records created in the course of each type of activity be considered accurate and why? What controls on their creation would make us presume that these records are accurate?

For Web exhibits that involve retelling of past events or representing archival records created within publicly-sponsored archival institutions, accuracy means an emphasis on factual accounts where interpretation of past events is minimized. Interpretation remains, to the greatest extent possible, the responsibility of the exhibit visitor. This notion reflects a long-held archival conviction that archivists are disinterested and trusted custodians who will not manipulate information for any specific end.⁹³ The source for the principle guiding practices for ensuring accuracy within Web exhibits created by government archives is the academic tradition of providing a thoroughly researched, factual basis for the narrative, complete with citations for sources consulted and used. Interpretation of the exhibit and sources is left to the users.

What does authenticity mean in the context of each activity? To what extent is the definition of record authenticity adopted by InterPARES 1 relevant to the records resulting from each type of activity and from the use of increasingly complex digital technology?

Neither government jurisdiction (i.e., municipal and provincial) specifically defines authenticity. Both jurisdictions make considerable efforts to ensure that visitors to the respective Web domains are aware that they are visiting a government Web site, through secure storage to protect the identity and integrity of the Web sites and through the use of Web page templates. As indicated in Section C under the "Technological Context," provision of security and development of Web standards falls outside the jurisdiction of the creator of the Web content. Establishing and preserving the archival bond between Web exhibits and other records through tools such as a classification system and records management application may also fall outside the authority of the creator of the content. In both institutions, approval/acceptance of Web exhibits at senior executive levels is included as part of the process of creating Web exhibits, thus assuring that the exhibits are duly authorized by the creating institution.

On what basis can the records created in the course of each activity be presumed authentic? How, in the absence of such presumption, can their authenticity be verified?

For the purposes of this study, Web exhibits can be presumed authentic within the creator's environment because they have not been transmitted through space and time, i.e., they continue to be authentic for use by the creator.

⁹³ "[Archivists] should resist pressure from any source to manipulate evidence so as to conceal or distort facts." From the International Council of Archives Code of Ethics, explanatory comments to article 1: Archivists should protect the integrity of archival material and thus guarantee that it continues to be reliable evidence of the past.

Web exhibits are designed to be accessed remotely, so that by definition the records are transmitted through space and time: from the Archives' Web server to the viewer's hosting platform. The Web exhibits that formed the focus of this study are designed and tested to display correctly on specific platforms, e.g., 640 x 480 pixel display, using a common browser application. Web exhibits can be presumed authentic in these environments. Web exhibits accessed using other technology, e.g., a cell phone, will not display properly and authenticity cannot be presumed. Authenticity can still be verified, albeit laboriously, by determining how the technology interprets the HTML coding (what it does when it encounters a pointer to an image file, for example). It may, however, be problematic to actually access all the HTML code with some technologies.

How is the authenticity of these records affected by their transmission across space and time? What controls on the process of transmission would ensure that these records will continue to be recognized as authentic?

The authenticity of these records currently appears little affected by their transmission across space and time. Part of the explanation for this may be that the records are still maintained in an active environment, and in keeping with recently established organizational (Web page template) and technological (HTML specification) standards. The following controls on transmission would ensure that these records continue to be recognized as authentic:

- Web exhibits continue to be treated as "fixed" records (i.e., that they not be changed or that changes be authorized and recorded);
- Web exhibits be maintained / preserved by the creator or a trusted preserver;
- all the components of Web exhibits continue to be correctly integrated in the exhibits; and
- browser applications remain backward compatible to correctly and completely support the HTML specification used to create the Web exhibits, or that as the HTML specification changes, that the HTML coding in Web exhibits is updated accordingly by an authorized and trusted party.

Domain 3 (Appraisal and preservation)

It became clear from the interviews that neither institution has undertaken any archival or preservation work on the Web exhibits they host. For this reason, it was felt that the case study findings did not contribute anything to the Domain 3 research questions.

Policy Cross-domain

To what extent do policies, procedures, and standards currently control records creation, maintenance, preservation and use in each focus area? Do these policies, procedures, and standards need to be modified or augmented?

The Web exhibits that were the focus of this study exist within a governmental, as opposed to a scientific or artistic, environment. Therefore this question is addressed in relation to the governmental focus in the response to question 20 in Section D.

Can an intellectual framework or frameworks be developed to facilitate the translation of policies, procedures, and standards into different national environments, sectors, and domains?

Given the reliance on standards created and maintained by the W3C, and the existence of records management standards such as ISO 15489, it seems likely that a framework for translating policies and procedures can be developed.

What legal or moral obligations exist regarding the creation, maintenance, preservation, and use of the records of artistic and scientific activities?

This question is addressed in the context of governmental activities in the response to question 21, in Section D.

What principles should guide the formulation of policies, strategies and standards related to the creation of reliable, accurate and authentic records in the digital environments under investigation? What principles should guide the formulation of policies, strategies and standards related to the appraisal of those records?

Given that records are created for reference or to guide actions, the principles that should guide the creation of trustworthy electronic records must be based on the value structure in which the records were created. To date, archival theory has relied heavily on an evidential value structure, although other value structures, such as those around open content, identified at the beginning of section C, may influence recordkeeping principles. If different value structures affect how authentic, accurate and reliable records are created, then archival appraisal must take those values into account.

What should be the criteria for developing organizational policies, strategies and standards?

Web exhibits are products of the emerging business processes of the two institutions considered in this case study. Organizational policies, strategies and standards are being developed on the basis of the purpose of Web content. Where Web content serves traditional transactional purposes, organizational policies, strategies and standards are generally in place. Where Web content serves newer, possibly non-transactional purposes, organizational policies, strategies and standards are undefined. Publication standards for the Web are not yet as comprehensive as those established for conventional print publications, for example. The criteria in this latter situation must be based on a clear understanding of the purpose of the business process generating the records.

Description Cross-domain

What is the role of descriptive schemas and instruments in records creation, control, maintenance, appraisal, preservation, and use in emerging recordkeeping systems in digital and Web-based environments in the three focus areas? Do new tools need to be developed, and if so, what should they be? If not, should present instruments be broadened, enriched, adapted?

With the exception of meta tags, we discovered no descriptive schemas used in the creation of Web exhibits—see questions 18, 22 and 23 in Section D. It was clear that descriptive schemas were used in the preparation of Web exhibits (descriptive databases were consulted for source materials, for example) and also to manage some of the components (such as digitized images). Navigation tools, such as site maps, and HTML encoding might be considered as descriptive instruments, however.

Navigational tools do not 'represent' records in the way that archival descriptions are designed to do, but they are clearly developed as a means of assisting resource discovery, just as the archival descriptive metadata. Since the Web exhibits studied reside in much larger Web site environments, and since Web exhibits can themselves be quite large, the navigation tools play a clear role in placing the information within the context(s) chosen by the creator, in a way that is analogous to navigating a multi-level file classification scheme to file, find, or understand a record maintained in a more conventional recordkeeping system.

HTML encoding on Web pages might be considered a micro-level descriptive instrument since it contains much information about the structure of Web content, and can also contain descriptive information about contents or components of Web pages. It may contain color codes used by the Web page, for example. HTML coding uses a highly technical metadata schema for defining colors—see the response to question 4.b. in Section D for more detail on color metadata. Color codes may not frequently be a critical descriptive element for records resulting from government activities, but may be much more important where records from artistic activities are concerned.

New tools could be created or existing tools enhanced to accommodate and make available descriptive and metadata elements, such as navigation tools and HTML coding, used in the maintenance of components of the Web exhibits. Elements of the technical metadata recorded for images in the Visual Database at the Archives of Ontario might usefully form part of an archival description—see question 22 in Section D.

What is the role of descriptive schemas and instruments in addressing reliability, accuracy and authenticity requirements (including the InterPARES 1 Benchmark and Baseline Authenticity Requirements) concerning the records investigated by InterPARES 2?

Descriptive instruments like <alt> tags, which provide alternative representations of Web exhibit content, contribute to reliability of records by reliably representing content in alternative ways. For example, a non-graphical browser might still present a record so that it is reliable if the <alt> tags accurately reflect the content that is not displayed. Similarly, meta tags, whether they are relied upon by Web search engines or not, can help convey the meaning and intent of a record. These elements would serve a role in terms of reliability, accuracy and authenticity only if the processes that bring them into being are themselves effective processes.

Navigation tools may also contribute to the authenticity of records by helping establish documentary form (authenticity requirement A.5) for Web content.

What is the role of descriptive schemas and instruments in archival processes concerned with the long-term preservation of the records in question?

InterPARES 1 identified the output of electronic records as part of the preservation business process. In any environment where the means of accessing the record is not in the control of the producer of the record, then instruments such as <alt> tags, meta tags, and navigational tools would continue to contribute to the authenticity and reliability of records. That is, preserved Web exhibits will continue to be experiential digital objects as long as the behavior of the user's technological platform can affect how they are rendered.

What are the implications of the answers to the above questions for traditional archival descriptive standards, systems and strategies? Will they need to be modified to enable archival programs to meet new requirements, or will new ones need to be developed? If so, what should they be?

The reliability and authenticity of Web exhibits may, in part, be based on the reliability and authenticity of each component that makes up the record when those components are themselves records in other contexts. This suggests the need for a "sub-record" level of description to reflect and represent relationships of record components within a record and record components external to the record.

What is the role of descriptive schemas and instruments in rights management and in identifying and tracking records components, versions, expressions, performances, and other manifestations, and derivative works?

The 'performance' of the record may be key in determining rights management. For example, if the Web pages of a Web exhibit exist but are not linked in any way, what is the relationship of the unlinked Web pages with the Web exhibit in terms of rights management? Similarly, rights governing record components affect a creator's right to create a Web exhibit in the first place and may affect the creator's rights over any exhibit developed using those components.

F. Literature Survey Findings

InterPARES 2 Case Study: Archives of Ontario Web Exhibits

Report on Case Study Literature Survey

Produced By: Peggy Heger, Research Assistant, UBC

Submitted: November 3, 2003.

1.1 Introduction

The attached literature survey was produced by Peggy Heger, InterPARES 2 Research Assistant (RA), at the request of the Lead Investigator for the *Archives of Ontario Web site Exhibits* case study, Jim Suderman.

The purpose of this literature survey was to identify, record and briefly summarize literature that would be relevant to the case study and, in particular, to provide sources that will be included in the case study literature review.

The survey was begun by another research assistant, in September 2003, and completed by Peggy Heger at the end of October. It includes 46 entries comprising bibliographic citation, comments upon the relevance, type and viewpoint of each entry, and a brief summary and/or analysis of the entry.

What follows is a more detailed description on the methodology used in the creation of this literature survey, as well as a commentary on the results.

2.1 Methodology

2.2 Parameters for inclusions

The materials to be chosen for inclusion in the literature review needed to reflect the subject matter of the *Archives of Ontario Web site Exhibits* case study. Broadly speaking, this means that the research assistants sought literature on the topic of on-line or virtual museum exhibits.

Moreover, the Lead Investigator requested inclusions related to the following topics:

- The creation process and business requirements surrounding on-line or Web exhibits;
- User studies detailing the demographics of museum Web sites or virtual exhibits users, as well as user requirements and preferences;
- Web site and virtual exhibit evaluations from the creator's point of view; and
- Any sources that dealt with on-line museum Web sites or virtual exhibits in context of the key InterPARES 2 concepts, such as preservation, authenticity, recordkeeping issues, etc.

The types of literature that were considered for the literature survey included primarily peerreviewed academic research papers; private organization and cultural institution reports, media articles, monographs and manuals were also considered. To provide the most up-to-date and relevant references, only materials from 1998 to the present were included.

The compilation of a literature survey is to some degree always a subjective process. More resources exist than were included. The research assistant weighed many factors in deciding which were pertinent or important. These included the research methodologies used, quality of content and writing, type of material and source, quality of references, and most of all, degree of applicability. For example, if a paper was on the topic of on-line museum Web sites but was poorly written or in any way outside the interests of the *Archives of Ontario Web site Exhibit* case study (on the topic of museum educational programming on-line, for example), then it was not added. Likewise, materials on the topic of key InterPARES 2 concepts such as preservation

that were not equally concerned directly with on-line museum exhibits or virtual exhibits were not included, as such information may be gained by means of other InterPARES 2 resources.

2.3 **Project Management**

To track the methods and time used in this project and to avoid repetition of effort and provide an easy means of reference for possible inclusions, two project management tools were created by the research assistant. The first was a working list of possible inclusions for the survey. This list, compiled using an Excel spreadsheet, included author names, titles and initially source locations and details on the material's type, relevance, and viewpoint. In its final form, columns on location, type, relevance and viewpoint were replaced by columns noting the material's inclusion status (yes or no) and a column to list reasons for non-inclusion.

The second tool, called the "Literature Survey Planning Sheet," also compiled on an Excel spreadsheet, listed the sources or methods used to find possible inclusions, notes on the success of the various sources or methods, and a listing of hours spent on the project.

These tools will be submitted with the survey and the report although it should be noted that these two Excel sheets are not part of the survey or the report per se, but merely tools that help document the process involved in conducting this project. As such, some of the column titles and information included may not have meaning other than to the RA.

2.4 Sources and methodologies used in searching for possible inclusions

Beginning with the methodology notes, citations, annotations and photocopied articles complied by the RA who began the project, Ms. Heger mined keywords and references from the bibliographies of the photocopied articles, and compiled a list of possible sources. Next, she searched the Internet for possible hints regarding pertinent keywords, source locations, relevant sub-topics, prominent authors in the field, etc. A professional librarian had been consulted by the previous RA with little success and so this resource was not consulted again.

Three broad categories of sources were identified: 1. academic journal indexes; 2. general Web sources, including on-line journals, professional association Web sites, and academic and cultural institution Web sites; and 3. library catalogues (searched for monographs and government publications). The planning sheet was then constructed with these three broad categories in mind.

Over the month of September, sources from within these three categories were systematically explored and tracked. Approximately nine academic journal indexes were queried. A high-powered, multi-index search engine, Dialog, was to be used but was inaccessible as the RA's time limit on her student account had run out. Twenty-four sources were included in the "General Web Sources" section of the planning sheet, although the number of sites and Web resources consulted was actually much higher: less applicable sites were not added to the sheet.

In general, the academic journal indexes proved to be relatively unhelpful in providing references to possible inclusions: only eight references from the indexes were used in total. One possible reason why these indexes were not useful is that the field of museum studies is a relatively small and obscure one. It may be that such material "falls through the cracks" when it

comes to gathering citations for the large commercial indexes. Similarly, only one applicable monograph was found in the library catalogue.

The general Web sources also provided few possible inclusions, with the exception of the museums and the Web conference papers from the *Archives & Museum Informatics* site, a service that offers conferences, consulting, publishing and training for cultural heritage professionals (<u>http://www.archimuse.com/index.html</u>). In fact, most of the inclusions of this survey were gathered from this resource.

The second largest source of possible inclusions for the survey was the bibliographic references within papers that were found. In this case, the references of each relevant paper were mined for possible inclusions. It should be noted that the numbers from this source are approximate. One means of deciding on the inclusion of an item is the extent to which different sources refer to it. For example, many of the papers included in this survey were referred to within many sources and other papers. At some point during the information gathering phase it became meaningless to track where an inclusion came from when it already had been referred to in a dozen different places or sources.

2.4 The process for adding entries to the survey

The parameters of potential inclusions are described above. Subsequently, every selected inclusion was tracked, collected and scanned for content, format, type, methodology, the presence of references, etc. Many citations in the initial list of potential inclusions immediately proved to be unsuitable for the purposes of this survey. Such materials were either found to be outside of the required date range, were unsuitable in content, poorly written or overly brief in format. In some cases, materials were inaccessible due to dead links or were not generally accessible on-line or through UBC library on-line journal accounts. In some cases, an interlibrary loan was requested for such materials if they appeared to be highly relevant. Some of the materials were marked for further consideration and were later either added to the survey or discarded on the basis of further analysis.

Materials that seemed more suitable were read and then either added to the survey or discarded immediately thereafter. Throughout this process, inclusions were listed for the purpose of tracking at what step inclusions were in the review process and for noting of reasons for inclusion or elimination.

Each survey entry includes the citation, a comment on the inclusion's relevance, type and viewpoint and a summary or annotation. Citations are in Turabian style, with links being doublechecked to ensure correctness. The relevance of each inclusion was graded "High," "Somewhat" or "Slight." The note under "Type" describes the format of the inclusion, its presentation or its underpinning methodology, including theoretical studies, case studies, user studies, and Web surveys. Notes under "View" identify whether the focus or viewpoint of the paper was on the user or creator, or, in some cases, the exhibitor. In some circumstances, other comments were added, including "preservation" or "security" to identify topics out of the ordinary.

Level of detail or description in the annotation depended upon the level of relevance. All annotations, however, contain at least a brief summary of the content of the inclusion. In

addition, most of the annotations include a brief comment on why the paper, article, etc. is useful for the purposes of the survey, or any particular weaknesses the inclusion may have. The style of the annotations may appear to vary somewhat as inclusions that were written by the first RA were kept 'as is' by the second RA.

3.1 Results – The completed literature survey

The completed literature survey includes a total of 46 entries. The entries may be categorized, according to relevance, as follows:

- Relevance: High 6 entries
- Relevance: Somewhat 8 entries
- Relevance: Slight 31 entries

The survey is organized by two separate formats, both of which have been provided to the Lead Investigator. The first format lists entries by relevance, then in alphabetical order by author within each relevance category. The second lists all entries in alphabetical order by author. It was decided that other methods of organization, including by type and by viewpoint, were impractical due to the highly repetitive content and form of the literature on this topic.

To a large degree, the entries consist of user studies of museum Web site or on-line exhibit users, and include information such as demographics, requirements, and preferences. Given the newness of this subject field (i.e., Web exhibits), there are also more general theoretical discussions on the nature of museum resources on-line based upon existing literature. In searching for possible inclusions, the RA noticed a wealth of case studies of museum Web sites. These studies were only included in the survey if they contained relevant and generalizable results or discussion as well as presentation of the details of the case itself. As well, the case studies included in this survey are those from which the author has drawn implications for future on-line exhibit creation processes.

Not surprisingly, few papers or materials were found on the topic of on-line or virtual museum exhibits that focus on the key InterPARES concepts. One notable exception is a recommendations paper written for the Smithsonian Institution by Charles Dollar Consulting, *Archival Preservation of Smithsonian Web Resources; Strategies, Principles, and Best Practices,* which deals with many of the concepts and considerations that are of importance to InterPARES. All others, however, deal with these concepts in the most cursory manner, if at all.

Generally, the RA tended to be inclusive rather than exclusive in her choices. Some seem not immediately relevant to the purposes of this case study but were included as a means of expanding upon the topic. For example, a few inclusions were added because they contain a good description of the interactive, dynamic or experiential capabilities that on-line museum exhibits currently have or may have in the future. In these cases, the reason for their inclusion is explained in the annotation. It is hoped their inclusion may provide the Web exhibit study team with a more complete picture of the current body of literature on the topic from which to complete their literature review. Finally, the RA feels that this survey is a good indication of the literature that exists on this topic. As mentioned, there is a high degree of cross-reference among the inclusions, a good indication of the completeness of a literature survey.

4.1 Submission of Literature Survey

The literature survey was submitted to the Lead investigator in both formats on 3 November 2003, along with the Literature Survey Report, Possible Inclusions List and Literature Survey Planning spreadsheets.

InterPARES 2 Case Study: Archives of Ontario Web Exhibits Literature Survey

Produced by: Peggy Heger, InterPARES 2 Research Assistant Submitted: November 3, 2003

Survey findings, ordered by relevance (High, Somewhat, Slight)

RELEVANCE: HIGH

Kalfotovic, Martin R. *Creating a Winning Online Exhibition: A Guide for Libraries, Archives, and Museums.* Chicago and London: American Library Association, 2002. Type of Study: Manual

View: Creator

This manual, written by a digital librarian and published by the American Library Association seeks to help librarians, archivists and museum creators conceive, design, and execute on-line exhibits. The manual is 117 pages, including appendices, and is organized into ten brief chapters.

The first chapter provides a concise definition of on-line exhibits (as opposed to on-line collections); it gives a brief history of their introduction to the cultural scene, and describes their uses and types. Chapters 2 through 4 lead the creator through the conception phase of exhibit creation, the execution of the exhibit idea, and staff considerations needed for an on-line exhibit creation project. Chapters 5 through 7 focus upon technical issues including the digitization of collections, markup languages and programming, scripting, databases and making the exhibit accessible. Chapters 8 and 9 discuss matters of design, with chapter 9 providing examples of award-winning on-line exhibits and including a discussion of their merits. Finally, chapter 10 provides a concluding discussion on what the creators may expect of their new on-line exhibits in terms of visitation statistics. The chapter also raises a few related questions such as "will the introduction of my on-line exhibit mean fewer bricks and mortar visitors?"

This manual is aimed at the layperson rather than those familiar with the creation of Web site content. Its chapters are concise, easy to understand and filled with illustrations and examples. After each chapter there is a full list of sources cited, which will allow the reader to quickly access more information. The book's easy-to-read and easy-to-manage format comes at a price, however: it would scarcely provide enough information to take a creator from start to finish of an on-line exhibition creation project. The technical chapters, for example, include an introduction to markup languages best described as 'introductory,' providing a paragraph each for SGML, XML, XHTML, and HTML. In addition, not enough information is given on such important topics as general project management. In fact, this manual's inclusive but brief treatment of the important elements of the creation process mean that it would be especially suitable to an individual who is required to work within a project team and needs to acquire a level of literacy rather than an individual carrying out the project him or herself.

For the purposes of this literature survey there are also some interesting omissions from the manual. For example, there is no consideration given to issues surrounding long-term preservation measures. More surprising, however, is the lack of information regarding security, a

significant issue where it is easy to copy content of copyrighted material or intellectual property. In fact, the only (cursory) mention of security within this manual is in reference to the use of a Common Gateway Interface and JavaScript. In addition, the variety of interactivity components described in this monograph do not go beyond a basic display of collection images and labels (which is perhaps to be expected in a layman's manual). Overall, however, the manual still provides a comprehensive, if shallow look at the creation process from the view of the creator, and provides a good idea of just how complicated the creation of an on-line exhibit can be.

Khoon, Leong Chee, Chennupati K. Ramaiah, and Schubert Foo. (2002) "The Design and Development of an Online Exhibition for Heritage Information Awareness." *Museums and the Web Conference, Boston, April 17-20, 2002.* Internet. Available at http://www.archimuse.com/mw2002/papers/ramaiah/ramaiah.html; accessed October 16, 2003. Type of Study: User Study Viewpoint: Creator

This study addresses the needs of the user in the creation of an on-line exhibition. It is based on co-operative evaluation, and a questionnaire survey. The 77 respondents, mostly postgraduate students in their mid- to late-20s with an equal proportion of males and females were asked to evaluate five on-line exhibitions as well as provide computer use information. In the co-operative evaluation the users discuss user interface problems encountered. This study concluded that in order to service the majority of users the site should be designed using an IBM-PC with windows and a 800x600 pixel monitor setting. A site with crossbrowser compatibility was needed. Textual sites with moderate interactivity were preferred over highly interactive sites that make use of Flash and Shockwave. When video clips were included the majority preferred shorter video clips with less download time. The majority stated that on-line exhibitions have considerable educational value and expressed interest in getting more information from the archival organization. It was therefore necessary to provide links for more information. To retrieve information effectively, it was deemed necessary to provide a search engine. Other points include the necessity for: content accuracy; the addition of quizzes, tutorial and games to bring the educational message across; different information formats to cater to different modem speed; and, free access to all the archived materials on a topic and links to other relevant materials. It was suggested that the system cater to the visually impaired and to provide virtual reality and video on demand for advanced users.

The second study of an on-line exhibit was based on the findings of the first study. 30 participants mostly of students, librarians, teachers and IT professionals, half of whom were in their mid-twenties with 63% female and 37% male, took part. Some of the findings concluded that 90% of the users did not read the help pages, 73% agreed that the multimedia enhanced the learning experience, 67% said the organization was good and the majority found the font colors, buttons and icons were appropriate. In conclusion it was noted that the user interface must be kept simple to reach as many users as possible. The user preferred a moderate level of interactivity and the simplest and best design would attract the visitor again and again.

Kravchyna, V., and S. K. Hastings. (2002). "Informational Value of Museum Web Sites." *First Monday: Peer Reviewed Journal on the Internet* 7, vol. 2 (February). Internet. Available at http://www.firstmonday.dk/issues/issue7_2/kravchyna/index.html; accessed 26 October 2003. Type of Study: User Study View: User

This paper reports upon a museum Web site user study conducted by two researchers from the School of Library and Informational Sciences, University of North Texas. The purpose of the user study was to answer the question: what information are visitors to museum Web sites looking for? The study was prompted by difficulties experienced during a photographic collection database and Web site design project for the African American Museum. During this project, the team experienced problems in defining the parameters of what should be contained on the site, including issues pertaining to the quality and quantity of digital images. As a result, research on visitor needs was deemed necessary. In conducting a literature survey for such studies, the researchers found that there was none available.

This study is to serve as a starting point for further research that will look at the informational value of museum Web sites. The methodology chosen by the researchers includes a literature survey on the informational needs of museum Web site visitors and a Web-based interactive questionnaire that was distributed on the Internet. Participants in this study included teachers, students, museum educators, scholars, museum staff, and general museum visitors.

The survey consisted of sections that gauged: 1. the software capabilities of the respondents' technology; 2. Information regarding the respondent's museum visits (when, how often); and 3. How or why the respondent uses the Web site. In total, there were 149 responses, 124 of which were valid for analysis, including: 14 scholars; 21 teachers; 34 students; 35 visitors; and, 20 members of museum staff.

In answer to the first question results of the study showed that a high percentage of all respondents are able to listen to audio files and to view video files. This, the researchers concluded, would have implications on how museums should present their information and collections through their Web sites. In answer to the second question the researchers found that the majority of users visit the Web sites before and after a physical visitation. The group of scholars, however, was the only group to show significant visits to museum Web sites even when they were not going to make a physical visit. The rest of the answers could be summarized with the finding that the greatest majority of the respondents (68%) visit sites to look for information about recent exhibits, and that they also use the sites to browse collections (63%). In third place regarding reported uses was the use of the sites to find information on special events (60%). Other uses including purchasing gifts and tickets, getting directions, conducting research and harvesting images, were also acknowledged as reasons for using the site, but to a lesser degree. As expected, the uses of a museum Web site also varied according to which group the respondent was in.

As the researchers state, this study was merely exploratory, and more detailed user studies are needed to expand and inform on this topic. This study is a simplistic but good step in the right direction. The methodology used is carefully devised and repeatable unlike much of the research in this area. The article itself is fairly easy to understand, with some useful background being provided in the Literature Survey section. Perhaps because it is considered to be an exploratory study little discussion on the implications of the results is provided. For purposes of InterPARES, it does not provide much information on the components and formats that users would like to see in the Web sites. Nevertheless, it is a good addition to the literature.

Ocklucky, Jim, Minneapolis Institute of Arts. (2003). "What Clicks? An Interim Report on Audience Research." *Museums and the Web Conference, held in Charlotte, NC, March 19-*22. Internet. Available at http://www.archimuse.com/mw2003/papers/ockuly/ockuly.html; accessed 17 October 2003. Type of Study: User study Viewpoint: Creator/User

Presented at the Museums and the Web Conference in 2003, this paper describes the major user study currently being conducted at the Minneapolis Institute of Arts. The paper serves as a mid-project report on this study, which seeks to assess user awareness, usage and satisfaction with the museum's Interactive Directory, Learning Stations, and Web site. In addition to measuring user satisfaction and usage, the study will use its findings to improve specific components of the services and will then retest user satisfaction and usage. Finally, all results, including the study's logical model, methodologies, instruments and other findings will be shared within the museum community.

Funded by a National Leadership grant, the study is broad in context and carefully devised in methodology. The user-study component utilizes several data collection methods, including inhouse and on-line surveys and a usability lab. The large and demographically varied sample comprises visitors to the Web site and the physical museum. Its numbers vary according to the data collection technique used.

At the time that this paper was written, the first set of data from the study had been analyzed and recommendations for improvements to the resources had been made. The first set of data showed both a high degree of overall user satisfaction and particular areas in which improvement was necessary. Demographic considerations and navigational issues were sought within the data and are included in the paper's discussion.

Overall, this paper serves as a model from which virtual exhibits user studies might be designed and conducted. The findings are presented in point form for each of the three interactive resources. The paper is easy to read and applicable to the broader issues of virtual exhibit usability and user expectations. Its major shortcoming is that it was written in the early stages of the project and so it is not conclusive. Smithsonian Institution, Charles Dollar Consulting. (2001). Archival Preservation of Smithsonian Web Resources; Strategies, Principles, and Best Practices. Internet. Available at http://www.si.edu/archives/dollar%20report.html; accessed 21 October 2003.

Type of Study: Consultation Paper View: Creator/Preserver

Produced for the Smithsonian Institute by Dollar Consulting, an independent consulting firm, this study was commissioned to "conduct a high-level assessment of the requirements for the archival preservation of Smithsonian Institution Web sites and HTML pages and to develop a strategy, guidelines, and best practices that would facilitate access to usable and trustworthy Web sites and HTML pages for as long into the future as may be necessary."

In commissioning the study, the Smithsonian recognized that its Web sites and HTML pages (including virtual exhibits and numbering over 75 sites and literally thousands of pages in 2001) are an important piece of the 'electronic corporate memory' of the provision of the mandate of the Institution and its various sub-units. At the same time, the Smithsonian recognized that these sites and pages had no formal records management or archival procedures and were, in fact, in danger of disappearing altogether. As a case in point, the paper notes that the first extant Web site of the Smithsonian, created in 1995, cannot be found.

The study describes the Web environment in terms of site content, technology, and relevant documentation. It also contains an appraisal of the Web sites, guidelines for preservation, and a preservation metadata model. Throughout are recommendations to help the SI set up their Web site preservation program. For anyone familiar with the literature on electronic records management, these recommendations are nothing new. In essence, Dollar Consulting proposes a holistic management of SI Web sites through their life-cycle. This includes such familiar aspects as including the Web sites as a record series and applying them to a retention schedule; documenting their creation, modification and archiving; using non-proprietary, standard technologies (XHTML); using an on-line archival storage medium in a secure electronic archives repository; using migration techniques, and so forth.

Dollar Consulting proposes the use of a 'snapshot' method to capture the Web sites for archival preservation. Using the snapshot method, still 'pictures' of the Web site are created, i.e., each snapshot is one such 'picture.' This is a method that has been in use for some time. Although a snapshot can be reliably preserved, its biggest failing is that it cannot capture the dynamic, interactive, or experiential qualities that are an important part of many Web sites (including those with virtual exhibits).

Therefore, the value of this paper does not lie in its recommendations but rather in the way it suggests applying such recommendations to the Web and HTML resources of a cultural institution. Although the information that this paper provides is not new, the way it frames the discussion around examples drawn from the Smithsonian Institution's Web sites is. It is the only example found that focuses on the preservation of museum Web sites (and by extension, virtual exhibits) and on the application of preservation techniques to the business requirements of a museum. Furthermore, in this report Dollar's expertise in the field of electronic records archival preservation is concise and well referenced.

Vergo, John, et al. (2001). "Less Clicking, More Watching": Results from the User-Centred Design of a Multi-Institutional Web Site for Art and Culture." *Museums and the Web Conference, Seattle, held March 14-17.* Internet. Available at

http://www.archimuse.com/mw2001/papers/vergo/vergo.html; accessed 24 October 2003. Type of Study: User Study/Case Study View: Creator/User

Presented at the Museums and the Web Conference in 2001, this paper summarizes a 10 month long research project conducted by IBM in 1999. The goal of this project was to develop the design concept of a multi-institutional art and culture Web site. To realize this aim, the researchers used a user-centred design approach seeking to create a site based on user requirements and needs as well as the business requirements of the museum.

The paper relates that consistent with principles of user-centred design systems should be built according to the following steps: set goals for projects; seek to understand users; assess the competitiveness of the system being designed; design every aspect of the user experience; create and evaluate designs iteratively with samples; and, manage the project through continual user observation and testing. The study sought to define the system and user needs, to create prototypes based upon those findings; to make improvements and test again. Five major cultural institutions were chosen for inclusion in the multi-institutional site that was to be built.

As part of the general framework of the project, the researchers sought to understand the needs of the users by defining the intended user population and the context of its use of the sites. They ran five major user-centred activities, including: interviews with museum curators; questionnaires to bricks and mortar visitors; on-line surveys with users of museum Web sites; focus groups; and usability walk-throughs of prototypes. The focus groups were conducted with a view to gaining information on the target audience, Web usage, and other related issues. During the focus groups, participants were given the opportunity to discuss topics surrounding site design, their views on virtual tours and site personalization. Curator interviews were conducted to gain an understanding of how exhibit design criteria are created and implemented, and how the curators target their audiences. The usability walk-throughs used existing cultural Web sites to screen a target sample for cultural interests and familiarity with the Web. Finally, the Web site surveys sought to gain information on how respondents used the Web to obtain art and culture related information and entertainment.

The results provide detailed information on why and how users are using cultural Web sites, and on their likes and dislikes. For example, most focus group participants found the idea of live tours a compelling reason to visit sites. The curator interviews showed a need to expand their audience base, and that museum Web sites are one way to do so. Most interesting, perhaps, is one usability walk-through result: participants did not care for active interaction with site content or with other people (e.g., chat capabilities).

Without presenting all of the findings of this fairly broad and complicated study, we note that it is perhaps the richest source of user study findings we found. The breadth and depth of such a study could only be afforded by a large funding body (in this case IBM). The design of the study is comprehensive, with the use of multiple methodologies, and the samples are large (the Web

surveys had 830 and 1417 responses); the results were compared according to such factors as respondent location, age, sex, and so forth. It often feels as if too much information has been packed into this one paper and some of the methodology is not adequately described. However, for our purposes it is still a highly informative and quotable inclusion in the survey.

RELEVANCE: SOMEWHAT

Almeida, Pilar de, and Shigeki Yokoi. (2003). "Interactive Character As A Virtual Tour Guide To An Online Museum." *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* Internet. Available at

http://www.archimuse.com/mw2003/papers/almeida/almeida.html; accessed 20 October 2003. Type of Study: User study/Case study Viewpoint: Creator

This study examines the use of virtual tour-guides in promoting interactivity with users of virtual exhibits. The study examines a virtual character's ability to engage and anticipate user needs through an experiment using a virtual character that leads a sample group of users through a virtual tour of a XVI century Portuguese ship. By means of a user questionnaire, the study then gauges several indicators of the virtual character's success, such as the level to which the tour was felt to be an entertaining experience, a good learning experience, and the degree to which the user felt that the interactions were meaningful and adaptive to user needs. The study results of this showed that while users rated the experience as highly entertaining, and felt that the character's remarks helped them to understand the topics. The study also found that the users were not altogether satisfied with the character's responses to questions or to the dialogue in general, and suggests that system improvements such as added keywords in the database and the addition of language tips to the interface may be helpful. Nonetheless, the general conclusion was that the potential of such virtual characters to motivate and engage users was successfully demonstrated.

Two academics from Nagoya University conducted this study which was part of the Museums and the Web 2003 Conference. The mode of interactivity it examines is one of particular interest to creators of virtual exhibits; through a questionnaire, it was able to measure the degree of usercharacter dialogue success and user satisfaction. This brief article also provides a summary description of the system's design, including its components for dialogue creation and detecting user interests, etc. Unfortunately, the general applicability of its results may be limited by the small and homogenous sample of its 11 university students.
Bernier, Roxane. (2002) "The Uses of Virtual Museums: The French Viewpoint." *Museums and the Web Conference, held at Boston, April 17-20, 2002.* Internet. Available at http://www.archimuse.com/mw2002/papers/bernier/bernier.html; accessed 16 October 2003. Type of Study: User Study Viewpoint: Creator

This study examines 10 virtual museum sites to determine how Web museums can provide knowledgeable information for the French people. The participant was small, totalling 37 French-speaking Parisians (21 men and 16 women), between the ages of 15 and 68, mainly university graduates. They were asked to evaluate (on a coding sheet) five features: the homepage, the ergonomics, the computer graphics, the content and the technological add-ons. Users agreed that all of the Homepage examples in the study gave a general idea of the topics. The two that were appraised most highly were the Metropolitan Museum of Art of New York (http://www.metmuseum.org/home.asp) and the Museum of Natural History London (http://www.nhm.ac.uk/) Both aim to reach specific user groups, e.g., children, and to provide opportunities for testing knowledge. On the subject of ergonomics users preferred hypertext links, a table of contents and a site map. They also preferred that computer graphics needed to match text information provided. The study found that the user preferred a content in which titles were sorted by captions. Titles such as "What's New?" and "Pick of the Month" draw users in. The site that received the highest rating in this category was the simple and accessible Memorial of Caen (http://www.memorial.fr/gb/expo/expo.htm) Technological add-ons appreciated by users included audio and video clips about the life of an artist. The use of virtual tours, like the one at the Louvre (http://www.louvre.fr/louvrea.htm), are also welcome.

Chadwick, J. (1999). "A Survey of Characteristics and Patterns of Behaviour in Visitors to a Museum Web Site". *Museums and the Web Conference, held in New Orleans, April 16-19 1999.* Available at http://www.archimuse.com/mw99/papers/chadwick/chadwick.html; accessed 16 October 2003. **Type of Study: User Study** Viewpoint: User

This survey conducted from December 3, 1997 to February 8, 1998 at the New Mexico Museum of Natural History and Science Web site attempts to answer the following: Who is using museum Web sites? Why are people using museum Web sites? What are the behaviors and characteristics of the on-line visitors? A single survey with 19 items was used and is included as an appendix at the end of the article. A total of 348 respondents (62.10% male, 37.90% female, average age 41.08 years) completed the survey. Results showed that the majority of people visiting the Web site were visiting alone (69.80%); the remaining (21.60%) were visiting as part of a family group. Of those that visited as part of a group, 41 indicated that there were two people in the group; 22 indicated that there were three. Those who visited as part of a group accessed more files than those visiting alone. Both individuals and groups, however, spent the same amount of time at the site: on average 20.78 minutes for individuals and 23.49 minutes for groups. The study concluded that groups tended to browse more than individuals, paralleling behavior in actual museums.

Cuncliffe, Daniel, Efmorphia Kritou, and Douglas Tudhope. "Usability evaluation for museum Web sites." *Museum Management and Curatorship* 19, no. 3 (September 2001): 229-252.

Type of Study: literature review/case study/procedural View: User/Creator

The authors of this paper show that small museums increasingly forced to utilize Web sites in order to reach and serve their public, do not have dedicated Web development staff nor sufficient expertise, time and resources to develop and maintain such sites, which, as a result, suffer from poor design and a general lack of usability. This paper reviews evaluation methodologies, including a literature review and a case study that includes direct observation, log analysis, on-line questionnaires and feedback and inspection methods. Its findings may be used by institutions to keep their Web projects on track and usable.

The literature review portion of this paper includes a thorough discussion on such issues as the role of this museum Web site, understanding the virtual visitor, how a virtual visit is conducted, what virtual visitors expect, the development process (in light of limited resources), and site evaluation in general.

The case study looks at usability issues pertaining to *The New Review of Multimedia and Hypermedia* Web site. For the direct observation component of the study, five proxy users worked through a set of six task scenarios, and their utterances, body language, and so forth were recorded. Here the researchers were not looking for results from their recorded observations, but information on how this evaluation method may assist in the development process in general. They found valuable information on such things as sample gathering, completion time, and task construction. The study then went through the same process for log analysis, the on-line questionnaire and feedback, and the inspection processes. Although actual results including information about the benefits and limitations of each of the methods, are too detailed and numerous to list here, we can say that each method was found to be particularly useful at eliciting certain information about site usability while using an inappropriate method could cause misleading or incomplete results. Finally, the researchers noted that new methods of interactivity will likely mean that new evaluation methods are necessary.

Although this paper is well referenced and written, it is perhaps too ambitious: none of the methods are described in sufficient detail. In addition, the methods used are already standard in usability studies regardless of the size of the institution. Finally, the whole point of the article seems moot because the biggest problem facing the kind of institutions being studies is a lack of resources. Thus, it is unlikely that the institutions will dedicate much time or resources to usability studies, despite their importance. The paper does, however, provide some excellent background information as well as good guidance for those who do wish to increase the usability of their sites.

Dierking, Lynn D., and John H. Falk. (1998). "Understanding Free-Choice Learning: A Review of the Research and its Application to Museum Web Sites." *Museums and the Web Conference, held in Toronto, April 22-25, 1998.* Internet. Available at

http://www.archimuse.com/mw98/papers/dierking_dierking_paper.html; accessed 21 October 2003.

Type of Study: Research Review/Critical Analysis View: User/Creator

Presented at the 1998 Museums and the Web Conference, this paper looks at the research regarding user needs and user studies up to and including 1998. Although it is not a user study in and of itself, the paper provides a general and well referenced discussion on user expectations and experiences of museum Web sites based upon the existing body of free-choice learning research (much of it conducted by the paper's author). It shows how many of the user's wants and requirements of virtual exhibits are, in fact, much the same as those of physical visits to museums.

Economou, Maria. (1998). "The evaluation of museum multimedia applications: lessons from research." *Museum Management and Curatorship* 17, no. 2 (June): 173-187. Type of Study: Case Study View: Creator/User

The writer attempts to evaluate the immediate and longer term effectiveness of a prototype interactive multimedia exhibit on the classical Greek colony of Euesperides held temporarily at the Ashmolean Museum in Oxford. The case study investigated four areas: the potential of multimedia to present an archaeological excavation and improve public understanding of archaeology; how formative evaluation assisted and influenced the design of the application; who used the program and who did not; the learning outcomes and emotional impact of the program; and the effect of the presence of the computer program on the ways that visitors explore the exhibition.

The study used informal user observation methods and a more formalized questionnaire given after using the program, as well as other evaluation methods including computer interaction logging, evaluation of comments in museum visitor books, and interviews with user (the article includes various sample numbers). Positive findings regarding the use of the interactive exhibit prototype in all of the evaluated areas were made. For example, it was found that the exhibit functioned well both as a presentation and interpretation medium, offering contextualization of artifacts on demand. The presence of the computer in the exhibition did not detract from museumgoers experience, but enhanced it, with 73% of respondents stating that it added to their enjoyment and understanding of the display. The study also found that male and female users were equally as likely to use the program, with females spending longer, on average, in its use.

Several recommendations for similar projects were offered, including guidelines for user interface design; guidelines for navigation through multimedia programs; guidelines for museums considering multimedia production; guidelines for collection of material; guidelines for integrating multimedia in the exhibition; and, the importance of summative evaluation.

The paper itself is clearly written and the results are laid out logically. Of particular use to the purposes of this survey are the business requirements that arise from the results.

Spadaccini, Jim. (2002) "Creating Online Experiences in Broadband Environments."
Papers and Museums and the Web Conference, held in Boston, April 17-20. Internet.
Available at http://www.archimuse.com/mw2000/papers/spadaccini/spadaccini.html; accessed 16 October 2003.
Type of Study: Demographic
Viewpoint: Creator

This article looks at the need to create on-line experiences for broadband users. The differences between broadband and dial-up connections are examined. By the year 2004 a projected 16.6 million users will have high-speed Internet services. This trend is leading to more multimedia on the Web. But as there are 110 million users of the Internet in the U.S. only 3% are connected with broadband. The article promotes the use of Webcasting, a system that is able to detect the rate at which the user is connected and reduces download time accordingly even though a slower connection produces poorer quality. Spadaccini then goes on to mention the various Web sites that make use of Webcasting as well as broadband-only sites. This article is based on secondary research sources and does not contain a bibliography.

Tibbo, Helen R., Kevin Cherry, and Claire Eager. "Preservation Metadata For the Real World: The NC ECHO Preservation Metadata Model." *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* March 12, 2003. Internet. Available at http://www.archimuse.com/mw2003/papers/tibbo/tibbo.html; accessed 17 October 2003. Type of Study: Technical Viewpoint: Preserver

This article discusses the development of the NC ECHO preservation metadata model which tries to create data management software that is easy to use and requires little customization. In April of 2002, a working group was formed to develop the intellectual model that would underlie the database. It was agreed that the NC ECHO would fall within the national and international standards. The working group looked at eight different metadata models and extracted 30 elements and seven element-specific qualifiers. The elements cover the creation of the digital image, image identification, image properties and rights metadata. Each of these elements was deemed important to long-term image maintenance. Known as the Metadata for Preservation of Digital Images (MAPDI), the elements were designed to serve repositories whose financial or technical training and support resources are limited. Microsoft Access was used to create the database. The paper goes on to list the 30 elements of the Metadata with a description of each.

RELEVANCE: SLIGHT

Arseneault, Céline, and Jean-Marc Robert Robert. "Having Fun Or Finding Information ? Usability for Kids Sections of Web Sites." *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* Internet. Available at http://www.archimuse.com/mw2003/papers/arseneault/arseneault.html; accessed 21 October 2003. Type of Study: Critical Analysis

View: Creator/User

Presented at the 2003 Museums and the Web Conference, this paper examines how the interfaces for children's virtual museum exhibits might be made more user friendly. The paper includes an interesting and well-referenced discussion on children's Web literacy and suggests that museum professionals cannot ignore the capabilities of this particular demographic. Web usability evaluation methods particularly suited to children and their developmental stages are included, as well as design considerations. Based upon a survey of literature, ergonomic analysis and Web usability studies for children, the researchers have developed an integrated and iterative model for an educational museum Web site aimed at children's needs.

Although essentially outside of the interest of this literature survey, this paper was included to show that addressing the varying needs of a museum's different demographics is essential in the creation process.

Baird, Jennifer, and Sylvia Borda. "The Importance of Integrity In Virtual Environments: A Discussion Of New Approaches To The Web: "Our World – Our Way of Life" Web site." *Museums and the Web Conference, held in Seattle, March 14-17, 2001.* Internet. Available at http://www.archimuse.com/mw2001/papers/borda/borda.html; accessed 28 October 2003.

Type of Study: Case Study View: Creator

Presented at the 2001 Museums and the Web Conference, this paper details the collaborative creations process for "Our World – Our Way of Life," a virtual exhibition that presents the perspectives of two diverse aboriginal communities: the Inuit and the Haida.

This case is presented in a personal voice and provides a comprehensive illustration of the complicated process of presenting and designing exhibitions for culturally sensitive materials. The use of the word "Integrity" in the paper's title refers to the need for the creators of this site to present materials in their proper cultural contexts. Technical details of design and accessibility are provided, as well as interesting commentary on the inherent challenges of communication for collaborative projects.

Bissell, Torsten, et al. (2000). "Protecting a museum's digital stock through watermarks." *Museums and the Web Conference, held in Minneapolis, April 16-19, 2000.* Internet. Available at http://www.archimuse.com/mw2000/papers/bissel/bissel.html; accessed 29 October 2003. Type of Study: Critical Analysis View: Creator

This paper, which was presented at the 2000 Museums and the Web Conference, presents a discussion on the various digital watermark technologies for use in protecting images offered online. It describes the history of the use of watermarking, as well as some of the concepts behind it. It also describes the technical components of modern digital watermarking, and explains why current technologies are not sufficient to protect digital resources. After an evaluation of existing systems and applicability, an alternative technique that does not include marking the original online image is suggested.

Breiteneder, Christian, Hubert Platzer. (2001) "A Re-Usable Software Framework for Authoring and Managing Web Exhibitions." *Museums and the Web Conference, held in Seattle, March 14-17, 2001.* Internet. Available at

http://www.archimuse.com/mw2001/papers/breiteneder2.html; accessed 17 October 2003.

Type of Study: Technical Viewpoint: Creator

This paper looks at ViEx, a re-usable software framework for the development and management of Web exhibitions.

Callery, Bernadette G. and Robert Thibadeau. "On Beyond Label Copy: Museum-Library Collaboration In the Development of a Smart Web Exhibit." *Museums and the Web Conference, held in Minneapolis, April 19-19, 2000.* Internet. Available at http://www.archimuse.com/mw2000.html; accessed 17 October 2003. Type of Study: Technical Viewpoint: Creator

The Carnegie Mellon Libraries, the School of Computer Science at Carnegie Mellon University and the Carnegie Museum of Natural History are collaborating to develop a Smart Web Exhibit (SWE). SWE was designed to adapt to the informational needs of the user. The goal was to give the user the ability to access material similar to the library catalogue. Visitors may either follow the suggested path of the on-line exhibit or travel on their own path by searching the document base by keyword, individual name or some specific term. At the writing of this article the Smart Web Exhibit was still in the specification and development phase.

Cameron, Fiona. "Wired collections – the next generation." *Museum and Management and Curatorship* 19, no. 3 (2001): 309-312. Type of Study: Critical Analysis View: Creator

This paper offers a concise commentary on and examples of three generations of on-line collections. The first generation includes a linear, hierarchical narrative approach to introduce users to museum collections. The second generation is typified by a more tailored and adaptive response to different usage situations, where the user can "create new organizations of information and contribute to the knowledge environment." According to the author, the future of on-line digital collections will utilize the information potential of collection objects. These new technologies will allow for more complicated spatial relationships and narrative structures between objects. In addition, the user will have the option to access a broader range of enriched contextual information and more creative user environments.

This paper is valuable in that it provides an informed description of future museum virtual exhibits. This description affords some sense of record preservation issues that may emerge as Web exhibits evolve.

Cleary, Yvonne. (2000) "An Examination of the Impact of Subjective Cultural Issues on the Usability of a Localized Web Site – The Louvre Museum Web Site." *Museums and the Web Conference, held in Minneapolis, April 16-19, 2000.* Internet. Available at <u>http://www.archimuse.com/mw2000/papers/cleary/cleary.html</u>; accessed 17 October 2003. Type of Study: User Study Viewpoint: User

The goal of this study was to determine how cultural differences affect user reactions to localized versions of the Louvre Web site. The four languages used for this study were French, English, Japanese and Spanish. Cooperative evaluation sessions were used to allow the user to verbalize his or her thoughts and actions with the evaluator present as s/he viewed the site.

Corcoran, Frank et al. (2002). "Inuit3D: An interactive virtual 3D Web exhibition." *Museums and the Web Conference, held in Boston, April 17-20, 2003.* Internet. Available at http://www.archimuse.com/mw2002/papers/corcoran/corcoran.html; accessed 16 October 2003. Type of Study: Case study View: Creator

This paper, presented at the 2003 Museums and the Web Conference, provides an overview of Inuit 3D, one of six virtual exhibits that will be part of the Virtual Museum of Canada. This online exhibit on the theme of Canadian Inuit features navigation through exhibit rooms and the presentation of photographs, video and artifacts using 3D and digital imaging technologies.

The potential usefulness of this article lies in its detailed and well-written description of the technological components and issues surrounding the creation of the exhibit (the context of creation). Factors discussed include the virtual exhibit technical platforms; content creation and Web integration; 3D model creation; and user-interface integration.

Dale, Robin, and Angela Spinazze. (2002). *Digital Preservation: Where we are. Where we're going. Where we need to be.* CIMI Consortium. Internet. Available at http://www.cimi.org/wg/awareness/awareness_rd_012002.pdf; accessed 21 October 2003. Type of Study: Interview View: Creators

The focus of this interview with Robin Dale of the Research Libraries Group, is on the need for a revolution in cultural preservation in light of the growing number of digital resources. The interviewee discusses the increased pressure to preserve digital resources, and the challenges associated with this need. The OAIS (Open Archival Information System reference model) is also discussed. The interview does not refer directly to the challenges of preserving museum virtual exhibits but is relevant in that it does provide an excellent consideration of some of the surrounding issues.

Dietz, Steve, and Walker Art Center. (2003). Interfacing the Digital. *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* Internet. Available at http://www.archimuse.com/nw2003/papers/dietz/dietz.html; accessed 20 October 2003. Type of Study: Discussion based on examples Viewpoint: Creator

This paper presents the works of the Walker Art Centre as a way of creating a dialogue on new physical interfaces for exhibiting works of art. Different interface mediums are introduced, including telematic tables that use gesture recognition software to enable the user to experience the art in an interactive, individualistic manner.

This article was presented at the 2003 Museums and the Web Conference. For our purposes, its value lies in its examination of the "interactive" and highly "personal" ways users enjoy virtual art exhibits, showing us that the two terms are not synonymous. Otherwise, the article may too specific in context to suit the purposes of this literature survey.

Douma, Michael. (2000) "Lessons learned from WebExhibits.org: Practical suggestions for good design." *Museums and the Web Conference, held in Minneapolis, April 16-19, 2000.* Internet. Available at http://www.archimuse.com/mw2000/papers/douma/douma.html; accessed 17 October 2003.

Type of Study: Design Viewpoint: Creator

The title describes it well. This article gives practical suggestions for the design of good on-line exhibits. An extensive survey of current on-line exhibits is used to identify the common qualities that make them successful. The article cites good and bad examples of Web exhibits. However, there is no empirical evidence to back up the judgements.

Dyson, Mary C., and Kevin Moran. "Informing the Design of Web Interfaces to Museum Collections." *Museum Management and Curatorship* 18, no. 4 (December 2000): 391-406. Type of Study: Case Study/Web Survey View: Creator

This paper examines research that was conducted to assist in the development of the user interface for the collections database of the Rural History Centre at the University of Reading. Evaluating a sample of seven sites similar to the one planned for the Rural History Centre site, the researchers collected a list of common or missing features related these to the site's usability, including its overall 'learnability', efficiency, and presentation.

This paper is included because it offers a pragmatic look at the business requirements involved in developing the human interface component of an on-line exhibit.

Freedman, Michael, and Plumb Design. (2003). Think Different: Combining Online Exhibitions and Offline Components To Gain New Understandings of Museum Permanent Collections. *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* Internet. Available at http://www.archimuse.com/mw2003/papers/freedman/freedman.html; accessed 20 October 2003.

Type of Study: Discussion based on examples View: Creator/Exhibitor

Presented at the 2003 Museums and the Web Conference, the paper considers the use of nonlinear narratives featuring little-seen parts of a museum collection to create provocative on-line exhibits. One example provided within this article is the "Timeline of Art History" at the Metropolitan Museum, which allows the user to conceptualize time through the depiction of relevant objects and through multiple possible narrative paths (www.metmuseum.org/toah/).

This is an interesting though non-scholarly article that provides yet another means of conceptualizing interactivity in on-line exhibits. It is also an advertisement for Plumb Design, a vendor that offers design services specializing in designing and implementing on-line exhibits.

Fry, Thomas K., Fry Associates. A Comparison of Web-Based Library Catalogs and Museum Exhibits and Their Impact on Actual Visits: A Focus Group Evaluation for the Colorado Digitization Project. Internet. Available at

http://www.cdpheritage.org/resource/reports/cdp_report_lrs.pdf; accessed 29 October 2003. Type of Study: Report View: Creator

This report, produced by Fry Associates for the Colorado Digitization Project, assesses the various strengths and weaknesses of the library catalogue (searchable text database) and the museum exhibit approach (visual exhibit of related artifacts) in presenting digitized collections. A sample of varying demographics was chosen and focus groups were conducted to carry out this task.

The study's results are directly applicable to gauging a user's views of virtual museum exhibits. The study compiled information on the impact of the virtual visit and its relation to the likelihood of actual visits. It found that most participants prefer the museum approach, and users viewing digitized collections were more inclined to visit the physical museum. This is the opposite of the findings for the libraries. The paper is well written and easy to understand, with the methodologies and results well documented.

Galani, Areti, and Mathew Chalmers. (2002). "Can you see me? Exploring covisiting between physical and virtual visitors." *Museums and the Web Conference, held in Boston, April 17-20, 2002.* Internet. Available at http://www.archimuse.com/mw2002/papers/galani/galani.html; accessed 16 October 2003. Type of Study: User Study/Case Study View: Creator/User

This paper, presented at the 2002 Museums and the Web Conference, considers the interplay between physical and virtual museum visitors and between physical and digital/interactive presentation methods and resources during the physical museum visit. For context, the author uses two pilot studies at the Lighthouse and the House for an Art Lover in Glasgow, Scotland, where the collaborative environment spans different media, including Web-based hypermedia and 3D virtual environments.

This article presents a very good discussion on the social context of museum visits. The methodogical descriptions (natural observation with data collection based on gestures and verbal cues) and the explanation of how the study results will be used is somewhat vague.

Garzotto, Franca, Maristella Matera, and Paolo Paolini. "To Use or Not to Use? Evaluating Useability of Museum Web Sites." Museums and the Web Conference, held in Toronto,

April 22-25, 1998. Internet. Available at

http://www.archimuse/mw98/papers/garzotto/garzotto_paper.html; accessed 21 October 2003. Type of Study: Methodological Discussion View: Creator

This paper, presented at the 1998 Museums and the Web Conference, introduces the SUE—a methodology for evaluating the usability of museum Web sites. SUE was developed to provide museum Web site creators with a heuristic, empirical, systematic and model-based technique with which to ensure that users get the most from on-line and off line (CD-ROMs, etc.) electronic or virtual museum resources. The methodology is described in an easy to understand and easy to apply manner. Unfortunately, at the time the paper was written, the technique had not yet been tested, and no further papers using SUE methodology were found. Nonetheless, it provides a good template for some of the considerations that should be addressed in user studies.

Giannoulis, George et al. (2001). Enhancing Museum Visitor Access Through Robotic Avatars Connected to the Web. *Museums and the Web Conference, held in Seattle, March* 14-17, 2001. Internet. Available at

http://archimuse.com/mw2001/papers/giaannoulis/giannoulis.html; accessed 17 October 2003. Type of Study: Case Study

View: Creator

Presented at the 2001 Museums and the Web Conference, this paper describes the TOURBOT project, a collaborative research and development effort between museums and technology providers to develop an interactive tour guide robot. The robot would be remotely controlled over the internet, serving as an avatar for the user.

At the time of writing, the project was not fully underway. Thus, no results or detailed discussion on system development could be provided. The main value of the paper lies in its depiction of yet another form of interactivity that might be considered in the context of virtual, interactive exhibits.

Gilbert, John K., and Susan Stocklmayer. "The design of interactive exhibits to promote the making of meaning." *Museum Management and Curatorship* 19, no 1 (March 2001): 41-50.

Type of Study: Theoretical/Conceptual View: Creator

This paper examines the application of an empirically based conceptual model, the Personal Awareness of Science and Technology (PAST), to existing interactive exhibits. This model has four components: the Target (the idea to be expressed in the exhibit); the Experiences (which is the activity provided by the exhibit); the Personal Awareness of Science and Technology or PAST (what a visitor brings to the exhibit and how s/he is influenced by it); and the Remindings (the memories that the visitor recalls from the experience). Within this model, the 'Experiences' is considered to be the most important of the components, and the most integral part of the exhibit design process.

The designing of Experiences in interactive exhibits may also take three forms: the exhibit may simply provide a simple demonstration of a phenomenon; it may closely replicate real-world phenomenon; or it may represent the real-world phenomenon by a physically dissimilar analogy. The degree of resemblance will vary with the real world experience the exhibit portrays and the needs of the user.

This article was chosen for inclusion because it provides a conceptual model for the design of virtual exhibits. The paper, however, does not do a good job of fully justifying or arguing for the use of the model and does not fully explain how the model was applied to existing exhibits or what came of this exercise. The results provided appear to be extremely general. Nonetheless, a paper such as this demonstrates a growing academic sophistication and a formal interest in the provision of well-designed virtual exhibits.

Grotke, Abigail, and Gina Jones. (2003) Web Preservation Projects at the Library of Congress. *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* Internet. Available at http://www.archimuse.com/mw2003/papers/grotke/grotke.html; accessed 17 October 2003. Type of Study: Technical Viewpoint: Preservation

In the summer of 2000, a team of staff from the Library of Congress examined three Web sites: The election 2000 collection (<u>http://www.loc.gov/today/pr2001/01-091.html</u>), The September 11th Web Archive (<u>http://september11.archive.org</u>) and the Olympics 2002 Web Archive (still under construction), to evaluate, select, collect, catalogue, provide access to and preserve electronic resources on the World Wide Web. Many questions were raised as a result. Which sites should be collected? How often should snapshots be made? What constitutes a Web site? What will researchers expect when they visit a Web Archive? How do we provide access to archived collections? What level of access do we provide?

Harrison, Dew. (2002). Internet: A Dynamic, Living Archive of Digitial Art? *Museums and the Web Conference, held in Boston, April 17-20, 2002.* Internet. Available at

<u>http://www.archimuse.com/mw2002/papers/harrison/harrison.html;</u> accessed 16 October 2003. **Type of Study: Case Study**

View: Creator

Presented at the 2002 Museums and the Web Conference, this paper considers the internet as a platform for the presentation, promulgation, and archiving of virtual art exhibits. The discussion is based upon the Digital Arts Curating and Practice Project, and in particular, the Net_Working living archive of hundreds of exhibits from around the world.

The main value of this paper lies in its brief consideration of the perils involved in relying upon the internet as a means of long-term preservation of virtual exhibits; it shows that preservation issues surrounding virtual exhibits are a concern in the museum community.

Milekic, Slavo. (2002). "Towards Tangible Virtualities: Tangialities. *Museums and the Web* Conference, held in Boston, April 17-20, 2002. Internet. Available at

http://www.archimuse.com/mw2002/papers/milekic/milekic.html; accessed 17 October, 2003. Type of Study: Conceptual Overview

View: Creator

Presented at the 2002 Museums and the Web Conference, this paper provides an overview of new modalities and technologies of interaction. The author notes a trend towards using more "human" interaction forms that better utilize the human senses while acknowledging that creators of virtual exhibits do not keep up with or fully utilize such technologies because of their limited knowledge or resources. This paper considers some of these technologies and limits to their use. It also makes the case for the creation and use of interactive mechanisms that make the interactive experience more tangible to the user. The value of this article is in its not overly technical descriptions of a wide variety of interactivity modalities and new technologies that may grow to play a large part in the virtual exhibits of the future.

Nordbottom, J. (2000). "Entering Through the Side Door – A Usage Analysis of Web Presentations". *Museum and Web Conference, held in Minneapolis, April 16-19, 2000.* Internet. Available at <u>http://www.archimuse.com/mw2000/papers/nordbotten/nordbotten.html</u>; accessed 16 October 2003. **Type of Study: User Study** Viewpoint: User

The goal of this study, which took place over three years, was to assess the information retrieval pattern of users viewing an on-line exhibit at the Natural Science Museum (96-97), the School of Social Science (97-98) and the Web from January 1999. Information was gathered to determine if the user would activate the exhibit, which topics s/he would see, the number of pages s/he would retrieve and the length of time s/he would spend. The session ended with an on-line questionnaire. Only 14 of 180 Web site visitors (7%) responded, an insufficient number to give a picture of the users (i.e., men or women or age). The study concluded that there are two Web user groups: those that search for specific information and those that browse within the general exhibit. It found that less than 50% selected more than 3 pages per topic. Some good information is contained in this article but the study clearly lacks information about the user.

Oono. S. (1998) *The world wide museum survey on the Web*. Internet Museum. Internet. Available at <u>http://www.museum.or.jp/IM_english/f-survey.html</u>; accessed 29 October 2003. Type of Study: Web Survey View: Creators/Museums

This Web survey, conducted by the Internet Museum, part of the Museum Communication Network of Japan, was undertaken to develop a comprehensive and international picture of extant museum Web sites. Two hundred six museums around the world responded to the survey; results were posted on-line as a 15-part report. The questions asked pertained to visitor statistics, technical components, and Web site content. Although the survey does not focus directly on virtual exhibits, questions regarding content and respondents' answers provide a glimpse of the different features that museums sites employ. The demographical information, is also valuable for anyone trying to answer the question "who is visiting virtual museums and why?" This survey is one of the most widely referred to in the current literature.

Paolini, Paolo, Thimoty Barbieri, Paolo Loiudice, Francesca Alonzo, and Marco Zanti. "Visiting a Museum Together: How to Share a Visit to a Virtual World." *Journal of the American Society for Information Science* 51, no. 1 (2000): 33-38. Type of Study: Case Study View: Creator

This paper describes a case study undertaken by researchers from the Hypermedia Open Center, Department of Electronics and Information at the Politecnico di Milano, Italy. The researchers wished to address the problem of transforming virtual museum visits from an essentially solitary experience to a more engaging, interactive and cooperative one. Based upon observations of the way people interact in a physical museum, and an examination of technologies that will best implement of an engaging virtual visit, the research team developed a prototype application of a virtual tour to the Museum of Science and Technology of Milan. The prototype, called *The Shareable Visit to the Virtual Museum of Science and Technology of Milan*, or MST, allows the user to navigate through virtual rooms and to use several interactive "tools." As an example of the interactive possibilities of the prototype, networked visitors can write to each other regarding the exhibit. Entered discussion text appears at the bottom of their screen. Another example of interactive features is the ability of the visitor to manipulate some of the exhibited materials (rotate them, for example). In addition, the prototype allows the visitor to "see" the exhibit through another's point of view, such as through the eyes of a tour group leader.

Although the article is fairly technical in nature, and its topic is somewhat outside of our purposes, it nonetheless provides an interesting consideration of broader interactive capabilities of virtual exhibits as well as the technological and user considerations that go into developing such capabilities.

Paterno, F. and C. Mancini. (1999). "Designing Web User Interfaces Adaptable to Different Types of Use", Museum and the Web Conference, held in New Orleans, March 11-14. Internet. Available at <u>http://www.archimuse.com/mw99/papers/paterno/paterno.html</u>; accessed 18 June 2003. Type of Study: Technical Viewpoint: Creator

This paper discusses the various general approaches that can be adopted to obtain interfaces that can adapt to different types of users. These techniques are employed in the creation of the Marble Museum, located in Carrara, Italy Web exhibit (http://giove.cnuce.cnr.it/servlets/StartVisitEng).

Semper, Rob. (1998). "Bringing Authentic Museum Experience to the Web." *Museums and the Web Conference, held in Charlotte, NC, March 19-22*, 1998. Internet. Available at http://www.archimuse.com/mw98/papers/semper/semper_paper.html; accessed 21 October 2003. Type of Study: Critical Analysis View: Creator

Presented at the 1998 Museums and the Web Conference, this paper provides a very good theoretical discussion, including examples, on the provision of on-line exhibits on the Web. The author asserts that on-line exhibit design should follow physical exhibition design. Because the paper was written in 1998, a relatively early time in the Web presence of museums, the information given is basic and fundamental.

Streten, Katie. (2000). "Honoured Guests – Towards a visitor centered Web experience." *Museums and the Web Conference, held in Minneapolis, April 16-19, 2000.* Internet. Available at <u>http://www.archimuse.com/mw2000/papers/streten/streten.html</u>; accessed 23 October 2003. **Type of Study: Critical Analysis/Case studies** View: Creator/Exhibitor

This paper examines how Web site development teams may improve their visitor's Web experience with use-evaluation methodologies. It provides a brief history of the rise in importance of Web resources as a means of visitor outreach and the interactive possibilities of

such resources. The paper then offers a discussion and examples of what it calls the three main forms of data collection for visitor evaluation: server statistics; qualitative studies and unsolicited comments; and researching existing studies and literature.

Perhaps the best feature of this paper is the resources that it provides, such as links to on-line packages for statistical analysis. In addition, the author discusses both the weaknesses and the benefits of the different methodologies,; this is lackingin other papers. However, the paper is weakly written and at times confusing and seemingly inconsistent. It is included here for its fairly weighty discussion on how museums can approach and utilize their own user studies.

Teather, Lynne. (1998). "A Museum is a Museum is a Museum...Or Is It?: Exploring Museology and the Web." *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 1998.* Internet. Available at

http://www.archimuse.com/mw98/papers/teather/teather_paper.html; accessed 23 October 2003. Type of Study: Theoretical

View: Museums

This paper provides a broad, well argued, well referenced theoretical discussion on the place of museums on the Web. The author raises many questions about the relationship between on-line exhibits and people, between exhibit providers and their audiences, and between virtual and physical museums. Written at an early time of museum's Web presence, it essentially takes the stance of: "where to from here?"

Teather, Lynne, and Kelly Wilhelm. (1999). "Web Musing": Evaluating Museums on the Web from Learning Theory to Methodology." *Museums and the Web Conference, held in New Orleans, March 11-14, 1999*. Internet. Available at http://www.archimuse.com/mw99/papers/teather/teather.html; accessed 21 October 2003.

Type of Study: Critical Analysis/Case Study View: Creator

Presented at the 1999 Museums and the Web Conference, this paper poses the questions: "what might museums accomplish on the Web?" "How do we know when we have accomplished our objectives for museum presence on the Web?" "What is it of the museum experience that we wish to convey via the Web?" It discusses museum work in general, and examines the evaluation study of the University of Toronto Amico Testbed Project.

Tinkler, Marc. (1998). "Online Exhibitions: A Philosophy of Design and Technological Implementation." *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 1998.* Internet. Available at http://www.archimuse.com/mw98/papers/tinkler/tinkler_paper.html; accessed 29 October 2003.

Type of Study: Theoretical Paper View: Creator

This paper, presented at the 1998 Museums and the Web Conference, offers a very salient, though unreferenced description of the nature and value of on-line exhibitions and their component parts. Following a somewhat emotive introduction, a list of tools that the author

considers to be necessary to on-line exhibit development is presented, with a reference to a case study at the Smithsonian Institution. This is not a scholarly paper; it is written by employees from Plumb design, a firm that specializes in on-line exhibits. Its general discussion on the topic is, however, very quotable.

Wong, Wendy Siuyi. (2003). "From On-Site to On-line: Experience on Transforming Exhibition." *Museums and the Web Conference, held in Charlotte, NC, March 19-22, 2003.* Internet. Available at http://www.archimuse.com/mw2003/papers/wong/wong.html; accessed 29 October 2003.

Type of Study: Case Study View: Creator

This paper, presented at the 2003 Museums and the Web Conference, compares the production of on-line exhibits in relation to the elements of a physical exhibition. The object of the comparison is to ensure a more engaging user experience.

This article was included as an example of how creators of virtual exhibits serve user needs through the use of interactive design factors.

G. Glossary of Terms

TERM	DEFINITION	SOURCE
<alt> tag</alt>	Refers to "a text equivalent for every non-text element".	d
Attribute	Elements may have associated properties, called <i>attributes</i> ,	с
(HTML)	which may have values (by default, or set by authors or	
	scripts). Attribute/value pairs appear before the final ">" of an	
	element's start tag. Any number of (legal) attribute value pairs,	
	separated by spaces, may appear in an element's start tag.	
	They may appear in any order.	
browser	A program which allows a person to read hypertext. The	b
	browser gives some means of viewing the contents of nodes	
	[i.e., Web pages], and of navigating from one node to another.	
Cascading Style	HTML supports a variety of style sheets. Cascading style	с
Sheet	sheets allows "style information from several sources to be	
	blended together. These could be, for instance, corporate style	
	guidelines, styles common to a group of documents, and styles	
	specific to a single document. By storing these separately,	
	style sheets can be reused, simplifying authoring and making	
	more effective use of network caching. The cascade defines an	
	ordered sequence of style sheets where rules in later sheets	
	have greater precedence than earlier ones. Not all style sheet	
	languages support cascading."	
domain	Within the Internet, domains are defined by the IP address. All	e
	devices sharing a common part of the IP address are said to be	
	in the same domain.	
Element	An SGML document type definition declares <i>element types</i>	с
(HTML)	that represent structures or desired behavior. HTML includes	
	element types that represent paragraphs, hypertext links, lists,	
	tables, images, etc.	
	Each <i>element type declaration</i> generally describes three parts:	
	a start tag, content, and an end tag.	
eschatocol	The third intrinsic element of conventional documentary form,	h
	as defined by the science of diplomatics. The eschatocol	
	normally contains elements such as the date, signature	
	(attestation), and qualification of signature.	
hit	(1) Also called a page hit. The retrieval of any item, like a	e
	page or a graphic, from a Web server. For example, when a	
	visitor calls up a Web page with four graphics, that's five hits,	
	one for the page and four for the graphics. For this reason, hits	
	often aren't a good indication of Web traffic. Compare with	
	page view.	
	(2) Any time a piece of data matches criteria you set. For	
	example, each of the matches from a Yahoo or any other	
	search engine search is called a hit	

image map	An area of a graphics object, or a section of text, that activates a function when selected.	e
link	An element in an electronic document that links to another place in the same document or to an entirely different document. Typically, you click on the hyperlink to follow the link. A link expresses one or more (explicit or implicit) relationships between two or more resources.	e a
Metatag	A special HTML tag that provides information about a Web page. Unlike normal HTML tags, meta tags do not affect how the page is displayed. Instead, they provide information such as who created the page, how often it is updated, what the page is about, and which keywords represent the page's content. Many search engines use this information when building their indices.	e
Navigation	The process of moving from one node to another through the hypertext Web. This is normally done by following links. Various features of a particular browser may make this easier. These include keeping a history of where the user has been, and drawing diagrams of links between nearby nodes.	b
Node	A unit of information. In the Web, a node is a Web page, any resource with a URI. For the benefit of users the term "document" is used as this is the nearest term outside the hypertext world. [Term not used in the body of the report, but included here because glossary definitions use it.]	Ъ
Plug-in	A plug-in is a program that runs as part of the user agent and that is not part of content. Users generally choose to include or exclude plug-ins from their user agent.	b
real-time	The actual time during which something takes place the computer may partly analyze the data in real time (as it comes in)	f
scroll	To change the portion of a document displayed in a window In a graphical user interface, scrolling is usually controlled by the user via scroll bars.	gj
servers	A program which provides a service to another, known as the client. In a hypertext system, a server will provide hypertext information to a browser. Development server: A server used to provide access to the developing Web exhibit, usually access is provided only within the organization itself. Production server: A server that hosts the Web site during the production stage for input from the development team.	b
snapshot	A Web site or Web page saved at a specific point in time using software. It simply captures that Web source at a moment in time.	

style sheet	See "Cascading style sheet"	e		
URL	Universal Resource Locator	e		
	The unique address of any Web document.			
user	An individual or group of individuals acting as a single entity.	b		
	The user is further qualified as an entity who uses a device to			
	request content and/or resource from a server. The principal			
	using a client to interactively retrieve and render resources or			
	resource manifestations.			
user platform	The platform defines a standard around which a system can be	e		
	developed. Once the platform has been defined, software			
	developers can produce appropriate software and managers can			
	purchase appropriate hardware and applications. The term is			
	often used as a synonym of operating system.			
Viewer	See "user".			
Web site	A collection of interlinked Web pages, including a host page,	а		
	residing at the same network location. "Interlinked" is			
	understood to mean that any of a Web site's constituent Web			
	pages can be accessed by following a sequence of references			
	beginning at the site's host page; spanning zero, one or more			
	Web pages located at the same site; and ending at the Web			
	page in question.			

Sources:

- a) Web Characterization Terminology & Definitions Sheet, W3C Working Draft, 24 May 1999, (<u>http://www.w3.org/1999/05/WCA-terms/</u>)
- b) Hypertext Terms (<u>http://www.w3.org/2003/glossary/</u>)
- c) HTML 4.01 Specification, W3C Recommendation, 24 December 1999, (<u>http://www.w3.org/TR/html4/intro/sgmltut.html#h-3.2.1</u>)
- d) Web Content Accessibility Guidelines 1.0,W3C Recommendation, 5 May 1999, (http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505/#gl-provide-equivalents)
- e) Webopedia, 20 August 2003, (<u>http://www.pcWebopedia.com/TERM/s/site_map.html</u>), 12 April 2004.
- f) Merriam-Webster OnLine 2004 (<u>http://www.m-w.com</u>), 12 April 2004.
- g) FOLDOC Free On-Line Dictionary of Computing (<u>http://foldoc.doc.ic.ac.uk/foldoc/index.html</u>), 3 August 2004.
- h) Luciana Duranti. "Diplomatics: New Used for an Old Science (Part V)" *Archivaria* 32 (Summer 1991), pp. 11, 14-15.

H. Process Diagrams

Web Exhibit Creation Process High-level Diagram



Detailed Process Diagram – Creation of Web Exhibits



Activity Definitions

- A1 Conceive exhibit
- A2 Approval of initial concept
- A3 Consult secondary sources
- A4 Initial selection of source materials
- A5 Seek permissions to use source materials
- A6 Finalize exhibit concept (scope, focus, source materials, permissions, treatments)
- A7 Approval of final concept
- A8 Compose supporting text
- A9 Shortlist source materials
- A10 Prepare exhibit components (scanning, digital recording)
- A11 Translation of exhibit text
- A12 Input derivatives of scans into Visual database
- A13 Store scanned image masters
- A14 Create Web pages
- A15 Link Web pages (execute navigation concepts)
- A16 Finalize Web exhibit for review and approval
- A17 Approval of finalized Web exhibit
- A18 Post approved Web exhibit to production server
- A19 Monitor Web site log statistics
- A20 Manage responses to feedback through Correspondence process

Appendix 1: Supporting Resources

The interviewees identified the documents listed here. These resources were used in answering the research questions of the InterPARES 2 project, in addition to the interview transcripts.

DOCUMENTS

- 1. The Web site of the Government of Ontario's GO Web Committee (copied to CD-R 12 June 2003) and used with permission.
- 2. Archives of Ontario Web statistics report [6 June 2003]
- 3. AO document: "Material planned for Web Site 2003 including Web exhibits" [24 Dec 2002]
- 4. Email (including attachments) re "The Changing Shape of Ontario" exhibit, 31 Oct 2002
- 5. Govt of Canada news release, 27 May 2003, announcing the Canada History Centre
- 6. Item received from Interviewee 17 Feb 2003:
 - Printout of Web exhibit page, with template fixtures highlighted
- 7. Item received from Interviewee 18 Feb 2003:
 - Job Profile: Manager, Archival Services
- 8. Item received from Interviewee 21 Feb 2003A:
 - City of Toronto Archives Meta Description and Meta Keywords
- 9. Items received from Interviewee 106A:
 - A screen print of the "Technical Data" captured for each scanned image used in a Web exhibit. Screen print identifies each data element (Reference Code, Item Reference Code, Image File, Box No., Date of scan, Colour, Scanned setting, Unsharp Mask?: Amt/Rad/Thres, Resolution, Size of original, Levels, Image size, Actions—see Appendix 3 for a screen print) but does not provide a catalogue of accepted values for each;
 - A printed 'production' report (listing of images scanned in numeric order) showing Collection #, Format description, Box reference, Image #, Reference Code, Size, and Description (this item and the previous one are in connection with question 14); and a
 - Blank Archives of Ontario "Request for Reproduction Services" form.

10. Items received from Interviewee 36P:

• 2 Dec 2002: Email announcement from Archivist of Ontario concerning exhibition and communications approvals, including attached approval forms;

- 14 Jun 2002: Email announcement from Archivist of Ontario concerning AO's 100th anniversary plans, including attached listing of planned exhibits and other projects;
- 27 Feb 2002: Emailed call for exhibit ideas;
- 1812 exhibit definition document;
- 1812 exhibit completed approval form;
- 1812 exhibit work plan document;
- Draft of "Making the 1812 exhibit" (exhibit component).

Appendix 2: Ontario Ministry Web Page Template

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Appendix 3: Visual Database (Archives of Ontario) Technical Data Fields

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lue.	Item Reference Code	C 330-1-0-0-1	
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Appendix 4: Alternative and Supplementary Questions

The alternative and supplementary questions listed here illustrate some of the limitations of the 23 questions, in the opinion of members of the study team. Their appearance here is to try and communicate to the reader what some of those perceived limitations are.

The questions generally fall into one of two categories: they are either alternatives to or variants on the 23 questions or they are directed at the user / viewer of the Web exhibits. In the first case, the 23 questions appeared to assume a well-established procedural and recordkeeping environment. When the questions were finalized, the case study was in its initial stages and the emerging nature of the procedures—or alternatively the 'trust-based work ecology'—were not yet evident and so alternative wording was not proposed. It would be possible to follow these questions up with the original interviewees, but because of the time and resources required, this course has not been taken.

In the second case, an on-line survey of visitors to the Archives of Ontario's Web exhibits was planned, and the user survey questions were developed, but limitations on Web-based user surveys by the Government of Ontario itself precluded the deployment of the user survey. Consideration of the user was considered important because

- 1. the Web exhibits were not created for the use of the creating institution—at least not in the way minutes of a meeting or the receipt of a purchase are, and
- 2. because of the experiential nature of the technology, where in the transmission of the Web exhibits through space, i.e., from the creator's to the user's platform, the behavior of the user's platform to render the record can significantly affect the user's perceptions of record content, structure, and context.
 - Is the Web site itself considered to be a recordkeeping system?
 - Are there plans to integrate Web resources, including Web exhibits into an institutional recordkeeping system?
 - When do you think Web exhibits might be appraised and scheduled?
 - Would you envision preservation activities focussing on maintaining the look and feel of the Web exhibits as they are currently? Or would preservation activities focus more on upgrading the Web exhibits to keep pace with changing Web technology?
 - It might be useful to ask the creator's what characteristics about Web exhibits make them records of the institution's business. Such a question might help expose any assumptions built into the 23 questions by the InterPARES Project focus.
 - Are users consulted on what they want to see in terms of Web exhibits?

The following questions are those prepared for an online survey of visitors to the AO Web sites:

- 1. Did you tour this exhibit because you were
 - a. Just browsing the Internet
 - b. Searching for information about the Archives of Ontario
 - c. Doing research for a school project
 - d. Looking for teaching materials to use in the classroom
 - e. Interested in the subject of the exhibit
 - f. Other
- 2. How easy was it to navigate the exhibit?
 - a. Very easy
 - b. Easy
 - c. Difficult
 - d. Very difficult
- 3. Did you tour the exhibit by going
 - a. Following the chronology of years?
 - b. Following your own choices of links?
 - c. [Govt Art Collection exhibit only] Following the narrated tour?
- 4. About how much time did you spend looking at the exhibit?
 - a. 1-5 minutes
 - b. 6-15 minutes
 - c. 16-30 minutes
 - d. more than 30 minutes
- 5. Did you view the video and listen to the audio files?

Video files	Audio files
Yes	Yes
No, wasn't interested	No, wasn't interested
No, my computer wouldn't play	No, my computer wouldn't play
them	them

- 6. Did any of the exhibit elements (a sound file, for example) make the exhibit more believable or understandable?
 - a. Yes
 - b. No

If so, were those elements (select all that apply)

- a. sound files
- b. video files
- c. pictures
- d. text

- 7. Did any of the exhibit elements seem confusing, irrelevant, or out of context?
 - a. Yes
 - b. No

If so, were those elements (select all that apply)

- a. sound files
- b. video files
- c. pictures
- d. text
- 8. Did touring the exhibit contribute to your knowledge of the topic?
 - a. Yes, significantly
 - b. Yes, somewhat
 - c. No
- 9. Do you feel that seeing letters, pictures, and movie clips online in this exhibit is:
 - a. Better than seeing the actual records in the Archives
 - b. As good as seeing the actual records in the Archives
 - c. Not as good as seeing the actual records in the Archives
- 10. Will you visit the Archives of Ontario online exhibits again?
 - a. Yes
 - b. No
- 11. [Demographic questions] Have you visited an Archives before for information (either on-line or in person)?
 - a. Yes
 - b. No
 - If Yes, have you ever visited the Archives of Ontario?
 - a. Yes
 - b. No
- 12. Please use the space below to provide further comments regarding this Web site exhibit.



Appendix 5: IDEF0 Activity Model









CS05 - Archives of Ontario Web Exhibits, Activity Definitions (20050529)			
Name	Number	Definition	Note
Approve Initial Concept	A1.2	To obtain approval for the initial exhibit concepts.	
Collect Materials for Exhibits	A2	To consult descriptive instruments, select items, collect quotations and	
		citations, and obtain approval and permissions.	
Collect Quotations and Citations	A2.3	To the gather the quotations and citations that support the candidate items.	
Conceive Exhibits	A1.1	To define the exhibit concept on the basis of the management call and the Archives of Ontario holdings.	
Consult Descriptive Instruments	A2.1	To examine the descriptive instruments of the Archives of Ontario according to the parameters established by the exhibit concept to issue the list of candidate materials.	
Consult Secondary Sources	A1.3	To examine relevant literature to elaborate the exhibit concepts.	
Create Archives of Ontario Web Exhibits	A0	To develop exhibit themes and concepts, collect materials, and develop web exhibit on the development server of the Archives of Ontario.	
Develop Exhibit	A3	To storyboard exhibit concept, make digital components, make web site, and obtain approval.	
Develop Exhibit Theme and Concept	A1	To conceive exhibits, approve initial concept, consult the secondary sources, and finalize themes and concepts.	
Finalize Theme and Concept	A1.4	To issue the final exhibit theme and concept on the basis of the refined concept.	
Make Digital Components	A3.2	To convert selected analogue materials to digital format, and transfer scanned images to a database for internal use of the Archives of Ontario.	
Make Web Page	A3.3	To design and realize the website using the digital components and the storyboard.	
Obtain Approval	A3.4	To seek and receive approval of the exhibit website design.	
Obtain Approvals and Permissions	A2.4	To seek and receive approval from management for the selected source materials, and permissions from the creators of the fonds from which the materials are taken.	
Select Items	A2.2	To choose among archival holdings the item in the list of candidate materials that correspond to the exhibit concept.	
Storyboard Exhibit Concept	A3.1	To finalize storyline with selected materials, compose text and determine overall and specific presentation features	
CS05 - Archives of Ontario Web Exhibits, Arrow Definitions (20050529)			
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Name	Definition	Note	
Approved Initial Concept	The first draft concept after it has been approved by management.		
Archival Holdings	The records held by the Archives of Ontario.		
Available Resources	The technology and technological knowledge available to the Archives of Ontario.		
Curator	The person responsible for the intellectual content and presentation of the exhibits.		
Curator and Archival Support	The curator of the exhibits and the staff that helps in the retrieval of the records for		
Staff	the exhibits.		
Curator, Technician, Website	The person responsible for the intellectual content of the exhibit, the person		
Coordinator, Manager	responsible for making all the digital components, the person responsible for posting		
_	all the materials on the website according to the storyboard, and the person		
	responsible for approving the exhibit.		
Descriptive Instruments	Inventories, guides and indexes that describe the holdings of the Archives of Ontario.		
Digitized Photographs Database	The database that contains all the digitized versions of the photographs selected for		
	the exhibits in TIFF format.		
Exhibit Concept	Scope, focus, source materials, permissions, and treatments.		
Exhibit Concept	The scope, focus, source materials, permissions and treatments.		
Exhibit Digital Components	The digital versions of the analogue materials and digital recordings chosen for the		
	exhibits.		
Exhibit Selection Team	All the employees of the Archives of Ontario who have contributed to the theme and		
	concept of the exhibit.		
Exhibit Storyboard	The storyline, the list of items to be posted, their layout, and the features of their presentation		
Exhibit Theme	The subject matter of each exhibit	This specific case study looks at 3	
		themes: 1) the War of 1812 2)	
		Toys of Our Childhood, and 3) The	
		Government of Ontario Art	
		Collection.	
Exhibits on Archives of Ontario	The web exhibits that reside, and are meant to be kept on, the Archives of Ontario		
Development Server	development server.		
Facilities of Archives of Ontario	The physical space that hosts the server and the database.		
Finalized Exhibit Concept	The concept as revised after the materials have been collected and approved.		
Finalized List of Materials	The list of materials to be digitized and posted after obtaining permissions and		
	approvals.		
Government of Ontario Mandate	The mandate of the Archives as established by the Archives Act of 1923 and the	More specifically, the function of	
	Management of Recorded Information Directive of 1992.	outreach.	

Government of Ontario Website Stylesheet Guidelines	The website stylesheets of the Government of Ontario.	
Human Resources of Archives of Ontario	Archivists, support staff, technicians, website coordinator.	The term archivist includes both the managers of the archives and the curator of the exhibits.
Initial Exhibit Concept	The first draft of the exhibit concept.	
List of Candidate Materials	The list materials that are proposed for the exhibit on the basis of the descriptive	
	instruments.	
List of Source Materials	List of records selected for exhibit and accompanying quotations and citations.	
Management Call for Exhibit	Directive issued by the management of the Archives of Ontario on the 100th	
Concepts	anniversary to develop exhibits of the materials held by the Archives.	
Provisional Exhibit Web Page	The first instantiation of the website as produced by the web coordinator.	
Records Selected for Exhibit	The records selected for scanning and posting.	
Records Selected for Exhibits		
Refined Concept	The concept as refined after examination of secondary sources.	
Refined Exhibit Concept	The exhibit concept as changed as a consequence of the items selected for the exhibit.	
Relevant Legislation and Agreements	Copyright legislation, Freedom of Information and Protection of Privacy Act, French Language Services Act, Human Rights Code, and Ontarians with Disabilities Act, and donation agreements in case of private fonds.	
Secondary Sources on Initial Concept	Published documents on the themes of the exhibits.	
Technician	The person responsible for making the digital components of the exhibits.	
Technological Resources of Archives of Ontario	Includes the server, database, and all the technology needed to produce digital materials and the website.	
User Accessibility Capabilities and Expectations	The ethical and informational needs that arise out of the varied technological capacities of users, their language, and possible disabilities.	Maintenance activities include monitoring website log statistics and managing responses to feedback.
Website Coordinator	The person responsible for coding and maintaining the web pages for the exhibits.	Maintenance activities include monitoring website log statistics and managing responses to feedback.