

Doing What's Possible with What We've Got: Using the World Wide Web to Integrate Archival Functions

Jean-Stéphane Piché

Abstract

This article explores one way of presenting archival information using the World Wide Web. It shows how different kinds of archival descriptive information resting in electronic formats in various legacy systems can be integrated and presented in a single view/window using flexible, simple information technology tools. It also presents to archivists the advantages of accessing integrated archival information on more than one archival function to enhance the archivist's conceptual knowledge of the record and records creators.

Introduction

This article explores how internal and external use of the World Wide Web ("WWW" or "the Web") can help archival institutions. It explains how archival functions themselves can be enhanced by the possibilities that the Web presents for sharing information. This article does not emphasize technological issues but rather shows how the integration of institutional current and legacy information can be contextualized and represented in ways that are useful to archivists. More specifically, the paper shows how the relatively straightforward WWW technology could promote the integration and dissemination of knowledge acquired by archivists during ap-

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praisal and description.¹ The result can be a richer understanding by archivists and their clients—sponsors, donors, and researchers—of the context of records and of records creators. The intricate web of relationships that is provenance can thus be better elucidated.

Those who appraise, describe, preserve, and provide reference on records all require distinctly different views or access to information about the records. Usually the information about records is clustered within archival institutions around functions or activities. For example, freedom of information and privacy information, appraisal research and reports, research for description, finding aids, and acquisition or preservation information regarding Statistics Canada is found in electronic form in various divisions and branches of the National Archives of Canada. Beyond archives, broad administrative and legislative information about Statistics Canada as well as the statistical records themselves are captured electronically and are available to archivists and the Canadian public alike on various World Wide Web sites. This phenomenon of having electronic information on the same “fonds” separated according to broad structures or to functions that archivists perform is starting to change, or at least, archival literature theorizes about these possibilities as well as the necessity for change. Articles on how to use creatorship information about records for archival description and debates about the use of metadata for archival description show that “documentation” or information created for electronic systems can also be used to some extent for archival description purposes.² Yet the use of this technology for archives can go well beyond archival description, and this article presents a few such possibilities. It does not propose another way to appraise or describe records using technology; rather, it shows how the Web can provide linkages between and across clusters of existing archival information to enhance the global contextual knowledge that archivists need in order to wisely perform ever more complex activities.

The paper begins with a short section summarizing Web concepts. This section is followed by an examination of some of the possibilities the Web

¹ For an overview of archives and the Internet see David Wallace, “The Internet: Basic Navigation and Resources,” *Archives and Museum Informatics* 8 (Spring 1994): 13–23. In the Canadian context see the two-part article by Bennett McCardle, “An Introduction to the Internet,” *Off the Record* 11 (Sept. and Oct. 1994): 1–5, and *Off the Record* 11 (Nov. and Dec. 1994): 2–5. Also, for archival resources on the Web, the Utah State Archives has gathered an impressive list of archives sites from around the world. Their URL address is <<http://www.archives.state.ut.us/referenc/hottop.html>>. For a list of Canadian archival websites consult <<http://www.usask.ca/archives/menu.html>>. For a review of archival websites see William Landis, “Archival Outreach On the World Wide Web,” *Archival Issues* 20 no. 2 (1995): 129–47.

² David Bearman, “Documenting Documentation,” *Archivaria* 34 (Summer 1992): 33–49, also published in Bearman, *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations* (Pittsburgh: Archives and Museum Informatics, 1994), 232–37. See also David Wallace, “Metadata and the Archival Management of Electronic Records: A Review,” *Archivaria* 36 (Spring 1993): 88–95, and Margaret Hedstrom, “Descriptive Practices for Electronic Records: Deciding What is Essential and Imagining What is Possible,” *Archivaria* 36 (Autumn 1993): 53–63.

offers archives as seen in two Internet-related projects currently being developed at the National Archives of Canada. Finally, several related WWW issues are presented for consideration.

Definitions

The World Wide Web is a hypermedia-based system that offers a graphic representation of, and access to, the resources available on the Internet. Information on the Web resides on computers connected to the Internet and using a server software (Web server). WWW information is accessed through these computers using browser software, such as Netscape Navigator. Communication between Web servers and Web browsers is governed by a hypertext transmission protocol (http), which allows Web browsers to simultaneously view and access the same resources available on Web servers.³ Each file residing on a Web server is identified and accessed by using a distinct Uniform Resource Locator (URL).

What makes the Web different from other Internet-based protocols is the use of a distinct markup language, HyperText Markup Language (HTML). HTML is essentially composed of tags, which are used to mark up documents, and a protocol to display those tags. HTML tagging provides the ability for the Web browser to integrate various types of electronic documents such as text, images, moving images, and sound. HTML tagging also provides the ability for the Web browser to invoke software through gateways which control communication between Web servers and the invoked application. "Hypertext" refers to an element of text or image captured in an HTML reference tag within a document which, when invoked, will cause another document to be retrieved and displayed. This is particularly important for archives because it provides the ability to link hypertext documents together in various ways through hyperlinks and thereby provide a context or an environment in which many disparate files can be interrelated in meaningful ways. "Websites" consist of interrelated HTML documents residing on servers created by individuals or institutions, while "home page" refers to the point of entry to these sites. "Internal Web" sites (commonly known as Intranets) operate on an institutional Local Area Network or Wide Area Network which uses Internet technology.⁴

For archival purposes it is important to know that HTML documents contain embedded hyperlinks that point to other HTML documents and

³ The Web also provides access to sites which require other Internet protocols such as Gopher and FTP.

⁴ Intranet is defined as "1) a computer network connecting an affiliated set of clients using standard internet protocols, esp. TCP/IP and HTTP. 2) an IP-based network of nodes behind a firewall, or behind several firewalls connected by secure, possibly virtual, networks" according to IDM Technologies Oracle Open World, <<http://www.innergy.com/ifaq.html>>.

HTML query forms used to search databases. This allows for the contextualization of HTML documents and the further contextualization of already contextualized archival documents when these are linked together imaginatively on an archival website. Thus archivists' knowledge about a fonds handled by several archivists within an institution or indeed across institutions no longer need be fragmented and compartmentalized by functional, structural, or jurisdictional barriers.⁵

For archives, the Web and the use of HTML offer a means of representing information about archival holdings, from appraisal to description, in any possible relationship to other series or fonds. HTML documents—whether fonds, subfonds, series, subseries, or item descriptions—and the use of gateway interfaces to access other entities residing on different operating systems can accommodate traditional hierarchical multilevel structural descriptions of holdings based on office(s) of origin as well as functional, thematic, name, or geographical “views” of the very same holdings. Such Web-based archival descriptions can also be linked to other archives' websites to form broader multi-institutional archival resources available on-line for researchers.⁶ The Web, again through hypertext linkages, can help contextualize information related to the potential acquisition of records, thereby enhancing the quality of archival appraisal decisions as well as providing cross-referential links to the descriptive records and to information existing on other institutions' websites.

National Archives of Canada Project

Background

At the National Archives of Canada, as in many large institutions, different aspects of computer technology have been introduced into functional sectors to achieve faster and more efficient ways of categorizing, accessing, and manipulating archival information. The result today is a panoply of different systems used to manage the various segments of the broad archival function. The following table outlines these separate information systems for government records by functional area or sector at the National Archives of Canada.

⁵ Glossaries of Internet terms exist on the WWW. See, for example, <<http://www.commserv.ucsb.edu/hpage/docs/glosnet.htm>> and <<http://www.sls.org/InetGlossary.html#aa10>>.

⁶ This complies with the spirit of the initial Rules for Archival Description (RAD) recommendations for exchange of information between archival institutions: to “undertake the necessary research to recommend mechanisms for the inter-institutional exchange of archival information” (Bureau of Canadian Archivists, *Towards Descriptive Standards: Report and Recommendations of the Canadian Working Group on Archival Descriptive Standards* [Ottawa, 1985], 72–73).

**Archival Information Systems on Government Records
National Archives of Canada**

Sector/Function	Systems	Information
Government Records Disposition	MS Access	History of Authorities
	Unstructured electronic texts (WordPerfect files on a common server)	Transfer Agreements Appraisals Terms and Conditions for Transfer of Archival Records
Monitoring Transfers of Records	Lotus Approach DB	Monitoring transfer of archival records from federal departments to Archives
Accessioning	Minisis (Minicomputer DB application)	Registration of accessions
Records Description	Unstructured electronic texts (WordPerfect files on a common server)	Administrative histories Record Group descriptions Series descriptions
	Minisis (Minicomputer DB application)	File level descriptions Unprocessed accessions

For the disposition function, information is captured in a variety of ways. A database (using MS Access) summarizes appraisal authorities for government records. Archival appraisal reports, transfer agreements, and terms and conditions for transfer of records are all electronic texts (WordPerfect format) residing on a common network server. A separate database, which uses Lotus Approach, has been created to keep track of records to be transferred and monitored, while information on accessioning resides on a database application, Minisis, which operates on a minicomputer. Descriptive information currently exist in two distinct environments: administrative histories, Record Group descriptions, and series descriptions, which are in word processing (WordPerfect) format; unprocessed accessions and file-level descriptions are captured in a Minisis database.

Once the possibilities of integration that the Web provides were understood, a prototype was defined that would look at integrating information on government records throughout the archival continuum or across archival functions as practiced at the National Archives of Canada. Two initiatives, one concerning appraisal and the other description, converged towards integrating archival information. The final product is an integrated internal website which provides, in a single window, a comprehensive view necessary to understand the context of archival records, the agencies that created them, the functions that animated them, and any supplementary information resulting from research on archives.

Archival Description Module

Information on archival holdings is complex because of multilevel descriptions including broad fonds, less broad series within Record Groups/fonds, subseries or cross-related series, and detailed items found within series. For Canadian federal government records at the National Archives of Canada, a Record Group or fonds usually represents all the archival records of a government agency or department; series usually represent the records of sectors, units, media, or recordkeeping systems in that government department. Many existing archival websites go to fonds- and series-level description only. This probably reflects a need to display the breadth of as many resources as possible to potential users; however, the WWW offers a lot more in-depth creative possibilities.

The internal Web prototype developed at the National Archives links general National Archives guides to Record Groups, series, and file-level descriptions. This product was developed by segmenting and then linking, in a hierarchical and horizontal manner, those fonds and series descriptions. The project first involved collecting all Government Archives Division description documents existing in electronic form. RG/fonds and series descriptions exist in WordPerfect format, while electronic finding aids at the file level were residing on a minicomputer database with a proprietary format (covering approximately 45 percent of our holdings). The second step involved designing the site architecture and identifying the navigational scheme. The third step involved separating out electronic documents to reflect the various levels of description and then converting them into HTML files; and the final step was to use HTML markups to link those documents together in as many ways as imagination and time permitted to enrich provenance context.

More specifically, the process first involved the segmentation of the electronic version of the published general guide to government records into various HTML documents, reflecting roughly all the items in the table of contents, which constitute the main points of entry. Using hypertext, all headings in the table of contents were then linked to matching records descriptions and finding aids. For example, the table of contents linked a list of Record Groups to the guide's Record Group-level descriptions, and these descriptions were finally linked to the actual Record Group inventories containing series level descriptions. The series descriptions in the Record Group inventories were also divided into various HTML documents reflecting the organization of the inventory. With the finding aid locator attached to all series, it became possible to link series to finding aid database extracts containing the actual lists of files for each series. This link from the series to the finding aids uses HTML forms and Common Gateway Interface to communicate with finding aids databases residing on different operating systems.

HTML forms allow users to query a database through a Web browser. In this particular case all the file level description records were exported from their proprietary environment into ASCII delimited files which were mounted in a database management system that can automatically generate an HTML query form and reports from queries.⁷ Using this strategy, over 1.5 million file-level description records for textual government archival records were converted and made available via the internal website.

In fairness, it is also important to stress the limitations of such linkages. For example, because of unresolved control issues it is not possible to link all file-level descriptions to their appropriate series-level descriptions since some of them do not contain series-level identifiers which are required to perform such a link. This, of course, is not the fault of the technology or methodology *per se*, but of weak past practices in description. Nevertheless it is possible, at this point, to link file-level identifiers and Record Group-level descriptions using present descriptions. So far, 155 Record Group descriptions and administrative histories have been linked to over 3,000 series descriptions, which in turn point to 1.5 million file-level records descriptions.

In this structure, all the information is organized primarily in a hierarchical fashion, from the general guide description, to Record Group inventories, to the series descriptions, and all the way down to file-level descriptions. This hierarchical structure is quite useful and efficient for research. However, the beauty of the WWW is that it can also accommodate other views or organizations of these data and descriptive entities. To these fonds-driven, top-down vertical descriptions are being added horizontal, functional, and thematic links between descriptive documents. For example, a thematic access to "transportation Canada" in our website provides contextual access to appropriate fonds, series, and file-level descriptions in the records of the Department of Transport, the Department of Railways and Canals, the National Transportation Agency, the Department of Public Works, the Department of National Defence, the Privy Council, and the Secretary of State.⁸

Moreover, in this environment, thematic or functional links do not have to be limited to internal resources; they can also be linked to on-line resources of other institutions. For instance, a series description for canals in the records of the Department of Railways and Canals at the National Archives of Canada was linked to the New York State Archives and Records Administration's "Source Guide to the Erie Canal System Records" on their website. In another example, a link from a series entry of the Statistics Canada

⁷ We used MS Access together with Cold Fusion, an application server which can generate HTML query and reports forms to any ODBC [open database connectivity] compliant relational database such as Access, Foxpro, and dBase.

⁸ This approach is starting to appear in archival websites. For example, the Milwaukee Urban Archives has developed an archival website which provides this type of navigation through archival resources. See <<http://www.uwm.edu/Library/arch>>.

Record Group inventory of records held at the National Archives of Canada (RG 31, series C, Census field) is hyperlinked to the Statistics Department of the University of Calgary's website, which provides a sample of anonymized microdata from the 1991 Census.⁹ These linkage possibilities reveal how the WWW can help to unleash description from its current, narrow, hierarchical structure and expand it to form part of a multi-institutional, multihierarchical, horizontally linked description system.¹⁰

Archival Appraisal Module

An internal website prototype devoted to appraisal is also currently being developed at the National Archives of Canada. This Intranet contains information on records disposition transfer agreements, disposition authorities, and the institutional profiles and detailed archival appraisal reports that archivists prepare.

In government records acquisition at the National Archives, the Government-Wide Plan is a macro-appraisal approach that looks first at functions, organizational structure, and activities of government as a whole and then focusses on analyses of specific functional agencies within the government.¹¹ Government records archivists developing appraisal documentation can greatly benefit from an Intranet site that provides multiple access to archival appraisals, records disposition authorities, institutional profiles, and other records disposition-related information, including the descriptions and metadata provided by government departments to the National Archives of Canada, as part of this appraisal and disposition authorization process.

⁹ <<http://www.ucalgary.ca/~libdata/census/1991/pumf/individuals.html>>.

¹⁰ Enhancement of access to descriptive components is already underway. The adoption by the National Archives of Canada of a new control standard for description will have the effect of standardizing archival descriptive information in a database format, which will greatly facilitate linkages between upper levels of description and enhance the search capabilities, eventually using the Web to integrate those levels of description. This site could be greatly improved if *all* levels of descriptions would be standardized in a database structure. However, this is not the case, which is why, given the wide variety of detailed finding aids in use at the National Archives of Canada, options such as Encoded Archival Description (EAD) cannot be readily implemented with great success, at least not for the time being. EAD is a Document Type Definition (DTD) or a subset of Standard Generalized Markup Language (SGML). EAD is a set of rules for defining and expressing the logical structure of an archival finding aid that allows software products to control searching, retrieval, and structured display of those finding aids. The rules themselves are applied by tags embedded in the electronic finding aid. As for accessing electronic records themselves through the WWW, strategies using data warehousing and Online Analytical Processing (OLAP) tools may prove to be more relevant in the future. Such tools permit "access to analytical content such as time series and trend analysis views and summary-level information, as well as insight into multiple dimensions." See Rich Carickhoff, "A New Face of OLAP," 10 *DBMS* (January 1997): 24–34. This article is also available on the Web at <<http://www.dbmsmag.com/9701i08.html>>.

¹¹ For a summary of the macro-appraisal approach see Terry Cook, "Mind Over Matter: Towards a New Theory of Archival Appraisal," in *The Archival Imagination: Essays in Honour of Hugh A. Taylor*, edited by Barbara L. Craig (Ottawa: Association of Canadian Archivists, 1992), 38–70.

As stated above, the appraisal information currently exists in various forms: appraisals, transfer agreements, and authorities are WordPerfect files resting on a common network server. A database management system (MS Access) also captures minimum historical information on authorities dating back to the 1960s. The appraisal Intranet project currently being developed in the Records Disposition Division includes the conversion of all appraisal reports and transfer agreements into HTML, which are linked to the front-end authorities database. These longer HTML documents contain the more substantive appraisal reports, transfer agreements, and authorities.¹²

Points of entry are chronological, by authority number, by agency, by government function (such as management of land), by appraisal strategy (case files), by activity (records relating to railways), or by information technology (all appraisals of office systems using x software). These disposition and appraisal documents will also be linked to various Canadian federal departments' websites and, more important, to their descriptions of their own current records holdings and of their mandates, structures, functions and services offered to Canadians.

In this way, the archival website will provide the ability to link and compare approved acquisition transfer agreements in order to confirm initial macro-appraisal hypotheses of where potential archival records may be found for broad government functions. Such information is not yet on-line, but if it were it would assist in confirming hypotheses of, for example, potential duplications of the archival record to be transferred. Those hypotheses, once confirmed, would be translated into individual appraisal decisions for each department's records as outlined in their disposition transfer authorities. Consistency and accountability in archival decisions will be assured through the interconnectivity of appraisal decisions via the use of a website using HTML documents and database interactivity.

For example, as I have noted elsewhere, a study of the real property management function of the federal government showed that over seventy-five institutions were involved in the management of federal property, each of them carrying out a small portion of this broad government function which often resulted in the creation of similar records across several departments.¹³ The study recommended that keeping only a small portion of the records from a few departments to document most of the real property function would both protect sufficient evidence of the land management function and activities *and* help to eliminate massive duplication of the archival record transferred to the National Archives of Canada. In this particular situation it

¹² The project in the Records Disposition Division of the National Archives of Canada was conceptualized by director Terry Cook and is being implemented by Danny Moore and Carl Bouchard.

¹³ See Jean-Stéphane Piché, "Macro-Appraisal and Duplication of Information: Federal Real Property Management Records," *Archivaria* 39 (Spring 1995): 41-50.

could become appropriate and even advantageous to link together all the decisions in the individual institution's records disposition authorities to understand why real property records from one particular department can be destroyed with knowledge that those records exist in substantial part in the records of a central agency. Consulting and comparing those decisions regarding real property, as HTML documents on-line permit the appraising archivist to do, would provide a comprehensive view of all appraisal decisions for one particular department's records or a particular cross-departmental function. This is especially important because departments, agencies, and structures change constantly with reorganization and downsizing, but the animating functions behind these fluid structures are relatively stable over time. And where archival records are to be destroyed, a link would be made to the central agency where similar records likely would be kept. In this way, there would be assurances all around that the best and only one archival record was kept.

Bridging All Archival Information

In light of these two National Archives of Canada initiatives involving the use of Intranets, efforts are underway to bridge descriptive and appraisal information into a seamless view for the user. From the descriptive module one currently has access to all Record Groups which roughly correspond to federal agencies. In addition to giving access to multilevel descriptive tools, a link is also made to the appraisal module for the corresponding agency or function which will provide information about related appraisals, transfer agreements, etc. Conversely, accessing the appraisal module for a particular agency also provides links to the corresponding descriptive components. As displayed in Figure 1, taken from the National Archives of Canada's prototype site for government records, a user can, from one single access point, have access to the descriptive information relating to an agency, administrative histories, series and file-level descriptions, appraisals, institutional profiles, transfer agreements, and authorities, as well as links to information held in agencies or other archives when such information is available or relevant. This enhanced contextual view of archives and their creators can only help increase and enrich our knowledge and that of our sponsors and clients/researchers.

Linkages of such Web resources could be used to complement and contextualize archival description of institutions' records. For example, if the appraisal hypothesis of which records to keep and which to destroy is applied and large amounts of federal departmental files are destroyed, it would be very important to note in the National Archives descriptions of a department's records that real property records had been destroyed because the

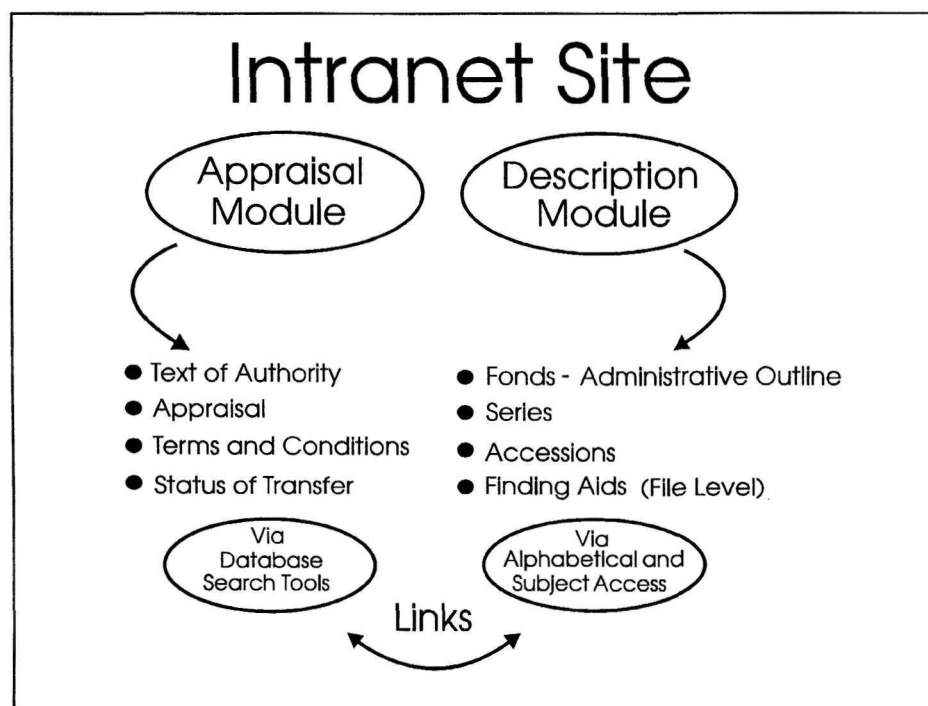


FIGURE 1. Intranet Prototype Mapping

real property function was also carried out by a central agency for which the National Archives of Canada has the relevant records. This “negative series entry”¹⁴ can only be envisaged in an environment where documents can be linked among various institutions and across the archival functions of appraisal and description. By this technology, archives can also more easily be held accountable for their own decisions of what they keep and what they destroy, which is desirable in any democracy where fundamental justice and citizen rights depend on the availability of recorded evidence of government. The Web seems to be the perfect technology to achieve this goal, especially since it is very easy to convert existing electronic documents to HTML files, almost regardless of resident software, and link them together. Most important among these possibilities is the recognition that the difficult linking exercise of contextual description remains (as it should be) in the hands of the archivist who has the knowledge of the records’ contents and creators’ context and, perhaps in the future, of the records’ formats and functionality.

¹⁴ This expression is from a conversation with Terry Cook.

Possibilities

Implementing Archival Strategies in Archival World Wide Web Sites

The Intranet/Internet WWW site also presents possibilities for visual representation of various strategies developed in the archival profession, whether to describe or to appraise records. The use of networking and information-sharing capacities of the Web provide new dimensions to these studies and make them more realistic. These strategies, which are built upon theory—and which exist, but generally unlinked, in textual form—could be linked to existing archival description or appraisal documents. Because the Web is a networking tool, archivists could also link these studies and research results to those in other institutions, such as private or government agencies or other archives.

Let us consider an example, the development of an appraisal strategy. In a website, a documentation strategy HTML textual report could include an analysis of government and private institutions performing similar functions related, say, to architecture.¹⁵ Such an analysis would examine functions, records-creating processes, and organizational structures of interrelated private and government organizations. In the case of architecture, administrative entities of institutions such as federal, provincial, and municipal departments of public works, and private ones such as the Canadian Centre for Architecture, professional associations of architects, and architectural and construction companies, as well as university architecture departments would all have to be analyzed to define an appraisal strategy. Such a strategy could only provide “contextualized” linkages if it made reference to related institutions when these have relevant information available on the Web, as well as make linkages with existing description documents to archival material on the function of architecture across various institutions. In the end, the functional analysis available in a Web environment would contain contextual links to all sites referred to in the report.¹⁶

In a different context, that of documenting records versus describing records, David Bearman has claimed that “documentation of the link between data documents, the context of creation, and use of records is essential

¹⁵ Helen Willa Samuels, *Varsity Letters: Documenting Modern Colleges and Universities* (Metuchen, N.J. and London: The Society of American Archivists and Scarecrow Press, 1992), 3–7. Such an analysis is, however, difficult to undertake in practice because of the difficulty of finding the tools to perform the analysis. According to Margaret Hedstrom, such analysis involves leaving the structures and resorting to a higher level of understanding by undertaking broad research and consulting commissions, reports, audits, reports of lobby groups, etc. See Margaret Hedstrom, “New Appraisal Techniques: The Effect of Theory on Practice,” *Provenance* 7 (Fall 1989): 11.

¹⁶ The WWW would also be helpful in representing other archival concepts that require cross-institutional analysis, such as “ambiance” (the relationships that define the broader functional and cross-functional context of provenance) as defined by Chris Hurley. See “Ambiant Functions—Abandoned Children to the Zoos,” *Archivaria* 40 (Fall 1995): 27. The same would likely apply to most archival strategies or methodologies currently present in the archival literature such as macro-appraisal, documentation strategies, archival hermeneutics, diplomatics, and so on.

if records are to have value as evidence.”¹⁷ This statement also applies to documentation on websites, since their HTML markups are metadata which dictate the context in which documents must appear or must be displayed on the website. These hyperlinks (the connections between and among documents or entities, in context) are relationships that, as they increasingly link information, transcend archivists’ knowledge of a particular information environment. As metatext¹⁸ about archives themselves, this information situated “inside” the Web offers, in turn, the ability to relate text to a greater context. Websites could even act as evidence of archives’ interaction with, and accountability to, society and, as such, would contain or reflect societal values that archivists are attempting to capture, and which archivists themselves will inevitably reflect in their own work and decisions.¹⁹

Archival World Wide Web Site Infrastructure

Because of linkage possibilities, the World Wide Web has the advantage of multiple representations of archival information in any form without using a preestablished structure. For archives, this means that entities such as fonds or series-level descriptions can be represented in a hierarchical manner, starting by identifying the creator and then going to a fonds/RG-level description, to a series description, and working from series to the file, item, image, or dataset description level. Such a description stream could include all the particularities that the Rules for Archival Description (RAD) or other description standards require—at least in terms of hierarchical relations between levels of description, i. e., the fonds-series-file levels.²⁰

Because of the Web, the very same description elements (or entities) could *also* be represented in an Australian-like model of description where the primary entry point is the series, from which you can navigate back “up” to creatorship information such as an administrative history or function or “down” to a file-level description.²¹ Better still, descriptive links could be

¹⁷ Bearman, “Documenting Documentation,” 234.

¹⁸ This expression is from Richard Brown and it refers to archival hermeneutics. See Richard Brown, “Macro-Appraisal Theory and the Context of the Public Records Creator,” *Archivaria* 40 (Fall 1995): 123. See also Richard Brown, “Records Acquisition Strategy and Its Theoretical Foundation: The Case for a Concept of Archival Hermeneutics,” *Archivaria* 33 (Winter 1991-92): 48–52.

¹⁹ Hans Booms, “Society and the Formation of a Documentary Heritage: Issues in the Appraisal of Archival Sources,” *Archivaria* 24 (Summer 1987): 105. See also Brien Brothman, “Orders of Value: Probing the Theoretical Terms of Archival Practice,” *Archivaria* 32 (Summer 1991): 80–85 and Rick Brown, “Macro-Appraisal Theory and the Context of the Public Records Creator,” *Archivaria* 40 (Fall 1995): 132–45.

²⁰ Bureau of Canadian Archivists, *Towards Descriptive Standards*, 60–65. Also see Dan Cantrall, “From MARC to Mosaic: Progressing Data Interchangeability at the Oregon State Archives,” *Archives and Museum Informatics* 8 (Spring 1994): 4–12. This article explores a methodology to migrate database MARC formats to Internet use.

²¹ Such a system exists on the Australian Archives World Wide Web site. See <http://www.aa.gov.au//AA_WWW/AA_Home_Page.html>.

made not just in the traditional vertical hierarchy, but horizontally between series, across media, between creators and functions, and across time. However, this scheme goes beyond what is understood about description today because the description documents (or entities) can also be linked to other related archival information generated by other functions, such as archival appraisals. Thematic guides can also be drafted and linked to existing description information from an archival World Wide Web site. This feature is important since it involves hyperlinking an electronic textual guide to related autonomous fond/RG-, series-, and file-level descriptions. These can be updated regularly without affecting the core of the electronic guide, thereby keeping it current and dynamic. While the National Archives of Canada government records WWW project has not explored all these avenues, it nevertheless has made enough progress to demonstrate the wonderful possibilities of using existing data in existing systems.

Networking Possibilities

Some active members of the archival community have undertaken the task of identifying archival websites and providing a "one stop shopping centre" for archival websites through hypertext linkages to those sites. The Utah State Archives has attempted this by providing access in their website to many other archival sites.²² This constitutes an important first step towards creating a real archival network. However, at this time, it appears that such an initiative does not provide much added contextual value to the archival information already contained in each site.

Websites for archives offer possibilities that could encourage professional archival and institutional networking. In regards to description of electronic records, Margaret Hedstrom has written about the "need to share data across institutional boundaries."²³ Taken seriously, this could mean a new role for archives as research and knowledge-base pointers to information resources in other archives, government, and the private sector. As a useful beginning, the National Archives and Records Administration in Washington, D.C. has put the U.S. Government Information Locator System inside NARA's website specifically to assume this kind of role in providing pointers on how to locate information in government agencies.²⁴ Similarly, Canada's Telecommunications and Informatics Services website provides multiple access to all federal departments which are on the Web.²⁵ As has been shown, Web networking

²² See <<http://utstdpwww.state.ut.us/~archives/referenc/!archive.htm>>.

²³ This view is expressed in recent archival literature. For discussion of the "need to share data across organizational boundaries," see, for example, Hedstrom, "Descriptive Practices for Electronic Records," 59.

²⁴ For an example of this, consult <<http://www.nara.gov/>>.

²⁵ The URL is <http://canada.gc.ca/depts/major/depind_e.html>.

possibilities can also bridge information on the same entities in two institutions, and thus build upon and enhance existing knowledge. If archives provide archival information on the Web, it could be consulted by private or government institutions which will link this information to their own.

How can archives be a part of this knowledge-based information network? How can we reflect evidence of the archivist's knowledge of the record and its functional, structural, and historical context into a Web product that is integrated, current, and useful for internal archives management, the general public, records creators, and academia? Such an agenda is possible if archivists encourage the dissemination of interlinked description and appraisal documents on the Web and allow the user of archives to process and access data from various angles to offer possibilities within only the limitations imposed by freedom of (or access to) information and privacy legislation.²⁶

The Research Agenda

The objective for archives should be to use Internet WWW-related technologies to make archivists' already deep, but often sadly disjointed, knowledge about the context and content of the records available and represented in the infrastructure of internal and external websites of archival institutions. This technology greatly facilitates a research-focused agenda for archives, i.e., to make archival knowledge products on websites the manifestation or representation of a broader research process in which archivists (should) engage.

The danger when putting archival products on the Web is the possibility of hiding contextual knowledge of the linkages between various records and records-creating processes, links to other archives' records of the same fonds or similar nature, links to other institutions' descriptive metadata about the same or related records: in short, the exclusion of the archivist's overall knowledge from the Web product. While it is recognized that it is important to provide easily accessible user-friendly products for the general public, all users should nevertheless have the opportunity to process electronic documents as well as access them. All users of archives should be able to access

²⁶ At the same time, archivists, who understand context better than most information specialists, must recognize that the Web holds only a partial view, at best, of a particular world. It is safe to say that websites together represent a First or Western world view of the world, since most sites are in North America and Europe and most of them use the English language. Also, the Web only offers by definition information that is available in electronic form. The Web is thus a very important source and tool for the archivist's research and knowledge-building, but not the only one. One can see how this issue is particularly important for archives, since websites for archives will provide access to information that exists in electronic form, and therefore run the risk of providing an illusion of their comprehensiveness to unwary or unwarned researchers. Thus, through using the Web, archivists will get only a partial view of a particular world, just as they can give only a partial view of their own particular world to Internet users.

holdings from a variety of access points on-line, to perform a host of complex finding aid searches in context, and to link their findings to their own research. That processing ability could only happen if an archival research agenda is followed in which the archivist's knowledge is integrated into the archival product. Avra Michelson and Jeff Rothenberg have argued that integrated archival products offering "ultimate end-user computing" possibilities will serve a greater research agenda for archives.²⁷ This refers to the capacity of software to allow researchers to manipulate data on-line and therefore integrate archival products into the fundamental research process.²⁸ The Web, in conjunction with software, can provide these possibilities, such as the ability to compute and perform sophisticated finding aid searches or navigate through description and appraisal documents.

Long before the World Wide Web, Terry Cook argued for a research agenda for archives that emphasized using archival knowledge for a greater purpose than simply providing information: "In summary, then, the study of archives encompasses the history of records, media, and series in the aggregate; the investigations required to appraise, describe, and understand individual documents; and the development of archival theory within the broader social sciences and humanities. . . .archivists must transcend mere information and mere information management, if they wish to search for, and lead others to seek, 'knowledge' and meaning among the records in their care."²⁹

Right now, such knowledge products in the electronic medium are being created by nonarchival institutions which utilize archives to seek and gather information for their own websites.³⁰ Perhaps archives should play a greater role on the WWW in support of and reflecting our own research agenda about the nature and character of records and their structural/functional context of creation. If archives do not claim a component of the research

²⁷ Avra Michelson and Jeff Rothenberg, "Scholarly Communication and Information Technology: Exploring the Impact of Changes in the Research Process on Archives," *American Archivist* 55 (Spring 1992): 245-46. "The ultimate user is the person who causes a computation to be performed and who uses the results of the computation. . . .[Computing becomes] an integral part of a researcher's thought process—and therefore of the research itself."

²⁸ Michelson and Rothenberg, "Scholarly Communication and Information Technology," 260. The steps in the use of technology in scholarly communication include: 1) identifying sources, 2) communicating with colleagues, 3) interpreting and analyzing data, 4) disseminating research findings, and 5) developing curriculums and aid instruction.

²⁹ Terry Cook, "From Information to Knowledge: An Intellectual Paradigm for Archives," *Archivaria* 19 (Winter 1984-85): 47, 49. Cook returned to this theme within the debate over whether to serve researchers through context-based knowledge derived from archival provenance knowledge or through "fast food" content-based information without context: Terry Cook, "Viewing the World Upside Down: Reflections on the Theoretical Underpinnings of Archival Public Programming," *Archivaria* 31 (Winter 1990-91): 123-35.

³⁰ For example, the University of Calgary Statistics Department offers samples of the 1991 anonymized microdata from the 1991 Census. The current URL is <<http://www.ucalgary.ca/~libdata/census/1991/pumf/individuals.html>>.

agenda and represent this knowledge on-line, it appears others will assume this role. Up to this point, the archivist's knowledge unfortunately lies largely inaccessible, buried in appraisal and other research reports on paper-based registry files or in desk drawers.

Conclusion

This discussion of archives and the Web has explored the use of the Web to manage archival information and has considered several possibilities, as well as issues for concern. The possibilities of the Web allow archivists to present, integrate, and harmonize their own research information from appraisal to description. The Web also harmonizes technology in a sense that, despite formats and structures, archival information residing on different operating systems can be linked and contextualized. These hyperlinks are relationships between archival texts that can themselves serve as evidence—and presentation—of the archivists' knowledge of the records and the context surrounding the records, for description as well as appraisal. Ultimately, this model connects the resources of archives to other resources on the Web. The resulting rich, contextualized patterns of knowledge greatly enhance the use of archives for all manner of researchers.

Back in 1992, before most archivists were even aware of the World Wide Web, Heather MacNeil remarked on the use of functional access to cut across structural boundaries to improve appraisal and description. She applauded Dutch efforts to develop "comprehensive, context-driven systems for appraisal, intellectual control, and access" though she recognized that "we may still be some distance from the electronically-driven golden city populated by archivists and users creating, linking into, and navigating through, provenance-enriched cultural databases and peer data files."³¹ With today's technology, we are closer than we were in 1992.

Today, many, if not most, archives have access to Internet technology. Many archives already have websites. This is what we've got. By creating hyperlinks and connections across functions and structures, archivists can enhance existing archival knowledge about their fonds. To echo Margaret Hedstrom's challenge, we could now be doing what's possible with what we've got.³²

³¹ Heather MacNeil, "Weaving Provenancial and Documentary Relations," *Archivaria* 34 (Summer 1992): 197. Others, beginning with Peter Scott in Australia and followed by David Bearman, Margaret Hedstrom, and Helen Samuels in the United States, Chris Hurley in Australia, and Terry Cook and Tom Nesmith in Canada, have been making the kind of cross-functional integration and interrelationships of archival and research knowledge that MacNeil articulates here.

³² Margaret Hedstrom, "Descriptive Practices for Electronic Records," 53–63.