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Observations on the Catalogers' Role in Descriptive Metadata Creation in Academic Libraries

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Abstract

This article examines the case for the participation of catalogers in the creation of descriptive metadata. Metadata creation is an extension of the catalogers' existing skills, abilities and knowledge. As such, it should be encouraged and supported. However, issues in this process, such as cost, supply of catalogers and the need for further training will also be examined. The authors use examples from the literature and their own experiences in descriptive metadata creation. Suggestions for future research on the topic are included.

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Keywords: metadata, cataloging, digitization, cataloger's role

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OBSERVATIONS ON THE CATALOGERS' ROLE IN DESCRIPTIVE METADATA

CREATION IN ACADEMIC LIBRARIES

INTRODUCTION

Advances in digital technology have created new opportunities for libraries to maximize access to their collections of texts and objects such as exhibitions, photographs, musical scores, slides and maps. A 1998 Association of Research Libraries (ARL) survey found that 66 percent of its member libraries were conducting digital projects in special collections and 25 percent were planning projects.[1] Another study, conducted in 2004, reported that 80.2 percent of ARL libraries were engaged in digital projects and the average number of projects in these libraries was 12.6.[2] However, in Hill's opinion, most libraries that have started digitization have done so with a small number of projects and may continue to do so into the immediate future. [3]

All digitization projects, regardless of their size, involve a variety of staff. Individuals are needed to manage the projects, select, digitize and preserve the resources, and provide access to them. In addition, each resource requires a description of its content, one that places the resource into a context that then can be used for searching in a database. In other words, the resources need to be cataloged or metadata need to be created for them. "Metadata are structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities."[4] The term has also been used when describing the cataloging of electronic resources or when referring to nontraditional metadata schemes. Metadata creation is a natural extension of the catalogers' existing skills, abilities and knowledge.

The purpose of this article is to examine cataloger participation in the creation of descriptive metadata, that metadata which most closely resembles traditional cataloging and are used for the discovery, identification, and selection of a digital resource. Although the focus of this article is primarily descriptive metadata creation for digital objects, the observations can apply to other digital resources. Examples from the literature and the authors' own experiences are used to determine the nature and extent of cataloger participation in metadata creation for these resources.[5] From this study the authors hope to gain further insights into how their role as catalogers might be changing in the future. Cataloger skills for this expanded role, costs, staffing and training issues also will be discussed. This analysis should be of interest to those planning metadata projects, those preparing future catalogers, and to catalogers themselves.

BACKGROUND AND LITERATURE REVIEW

In order to gather more information on the nature of cataloger involvement in metadata projects beyond their own experiences, the authors asked readers of Autocat and Serialst if catalogers are involved in digitization projects and to describe what role or function catalogers provide in these projects.[6] The small number of replies (twenty one) provided mixed results from which statistical inferences could not be drawn, but they further illustrate the ambiguity of the cataloger's role in metadata creation. The majority of respondents requested a summation of the information rather than contributing to the discussion. Nine respondents indicated that the catalogers were involved in co-operative projects. The roles of catalogers varied among institutions and included metadata description, creating documentation and templates, determining standards, consulting, revising the work of others, training and creating crosswalks. Three respondents indicated

that catalogers are not involved in metadata description, and one library is trying to empower staff to become involved. One respondent also noted that catalogers are left out of the metadata creation loop due to a lack of time to devote to this new format. Three respondents reported the hiring of new staff or the creation of a new position. Two commented that experienced cataloging staff are able to make the transition easily from traditional cataloging to metadata creation. Further training in metadata schemes and software programs was, however, necessary. This additional training was obtained from metadata workshops, professional reading and consulting with others.

The role of the cataloger in the creation of metadata has been discussed among cataloging professionals in recent years. An American Library Association (ALA) 2003 Task Force survey reported that catalogers were the staff most often responsible for 'defining and/or applying the metadata standards.' [7] Heads of cataloging departments reported that digital initiatives are impacting both staff and priorities in libraries.[8] Additionally, at the June 2005 ALA annual conference both the Association of Library Collections and Technical Services (ALCTS) Heads of Technical Services of Medium-Sized Libraries and the Technical Services Directors of Large Research Libraries discussion groups included metadata topics as part of their agendas.[9] Cataloging educators are also discussing the addition of metadata education into the curriculum.[10] Some library schools are creating programs to address future needs in the area of digitization. For example, Indiana University and the University of Illinois at Urbana-Champaign are partnering to create a master's program and post-master's certificate program for training information specialists in digital library development. [11] Despite these on-going discussions and interest, the scope and nature of current and future

cataloger involvement in metadata creation in academic libraries is not clear. Relevant literature is difficult to identify due to the broad interpretation of the term "metadata".

A review of cataloger position descriptions in job announcements is one way of determining if metadata activities are appearing in cataloging positions. Ellero examined the roles and responsibilities of catalogers outlined in cataloger job descriptions posted on selected listservs from late 1997 through May 2003. She found only 8 percent of the descriptions listed 'Digitization Projects/Digital or Virtual Library Involvement' and 18 percent listed 'Metadata Knowledge/Application.' [12] There are several possible interpretations for these low numbers. Digital activities may be considered part of cataloging and not separately noted. Metadata may not be created in cataloging departments or are being performed by staff that do not carry the title "cataloger." Job descriptions that include metadata applications are not limited to catalogers. Therefore, position descriptions posted to other listservs focused on areas such as archives might reveal different results. Since metadata creation is a more recent addition to cataloger responsibilities, job postings are just beginning to reflect this activity.

Numerous examples of digitized collections appear on library, museum, archives, and historical society websites. In addition to the descriptions of their collections, some sites such as the Colorado Digitization Program provide examples of best practices.[13] Other university library sites such as those at Cornell University, University of Oregon, and University of Tennessee describe and promote their digital services (including metadata creation) to the university and/or larger community.[14] Recognizing that the focus of these descriptions is aimed at the end user, these sites provide few specific

details on the cataloger's role in these digitization projects or this information is not accessible to the public.

Although information on how these projects impact on the library's current organization, workflow, cost, and staffing is absent at these websites, the literature does provide a sampling of how some catalogers are participating in digital projects. Catalogers at Georgia Institute of Technology Library worked collaboratively with catalogers at the Woodruff Library at Emory University to create metadata for archive collections.[15] At Kansas State University, catalogers were members of collection teams defining elements of document type descriptions for collections in the university's digital library. [16] Scientists at the University of North Carolina, Wilmington consulted catalogers for assistance in integrating iLumina, a collection of the National Science Digital Library, into the library's catalog. Catalogers created crosswalks for the conversion of iLumina's IMS (Instructional Management System) records into MARC format for the library catalog and into Dublin Core for the National Science Digital Library.[17] Catalogers are also creating metadata for state and regional collections such as the Iowa Heritage Digital Collection, Colorado Digitization Program, and Western Waters Digital Library.[18] The cataloger's role may be more challenging when collaborating with a diverse group of partnering institutions such as museums and historical societies. In these instances, it may be necessary for catalogers to adjust to different missions and cultures, user needs, and diverse sets of metadata standards. At the University of Washington Libraries, catalogers drafted data dictionaries for digital collections held at several small local heritage associations.[19] Catalogers are also training staff at partnering institutions to create metadata.[20] These examples illustrate that catalogers are involved in projects; however,

there is no indication whether all catalogers or just some catalogers are participating in this process.

Some authors have commented on the advantages of having an experienced professional cataloger involved in planning and participating in digitization projects. Woodley credits the hiring of experienced metadata catalogers with expediting the metadata creation workflow in her library's project.[21] In a study of scientist and cataloger collaboration in the creation of metadata, Greenberg and Robertson reported that scientists supported cataloger assistance in metadata generation and more than half of the scientists they surveyed identified "subjects" as the area most in need of metadata specialist assistance.[22] Subject expertise has also been recognized as an important component in descriptive metadata creation at ISU. For example, when describing chemistry department photographs, a cataloger with knowledge of chemistry can provide accurate and detailed subject access by supplying the correct names of scientific apparatuses and processes. Subject access is an area where opportunities exist for collaboration between bibliographers and catalogers.

CATALOGER SKILLS FOR METADATA CREATION

Catalogers already possess many of the necessary skills for descriptive metadata creation. "The only difference: now our job skills and expertise are marketable, transferable, and indeed aggressively sought out in the current technological information explosion."[23] DeZelar-Tiedman identified the credentials catalogers have to offer to digital projects: "experience designing and populating databases … understanding the importance of, and construction of, taxonomies and controlled vocabularies; an analytical and detail-oriented nature; and philosophical, if not technical, understanding of the

importance of balancing the need for standards with the demands of interoperability."[24]
Chopey noted that catalogers adapted very quickly to descriptive metadata creation.[25] Not only are catalogers familiar with the four Functional Requirements for Bibliographical Records (FRBR) principles to find, to identify, to select and to obtain, these principles form the foundation of traditional cataloging. Catalogers have experience analyzing bibliographic elements and understand terms such as editions, printings, versions, selections, adaptations, translations, and analytics. They can easily transfer these skills to metadata applications such as identifying the relationship between an object and its description, between a scanned image and the original resource, or between an item-level and collection-level record.

Knowledge of Standards

Most catalogers have extensive experience working with various standards and guidelines that are constantly in flux. The various editions of the *Anglo-American Cataloguing Rules*, CONSER, MARC and local practices are but a few of the guidelines catalogers use. They understand the value of these standards and their significance in the search and retrieval process. They also are well aware of what happens if standards are not maintained. These skills position catalogers for roles in selecting appropriate metadata schemes and locating and adapting crosswalks.

Catalogers also understand the importance of uniformity and consistency of authority control and the benefits of cross referencing from alternative forms. At ISU the catalogers document problematic headings in a shared electronic file. This facilitates consistency among catalogers in the choice and form of access points. Catalogers recognize the importance of controlled vocabulary and its relationship to keyword

searching and information retrieval. They have experience with subject analysis, multiple thesauri, and issues of hierarchy and granularity.

In addition, catalogers work with online systems and understand how the indexing of data elements affects retrieval in databases. Some catalogers are involved in alpha and beta testing of systems. Many have experienced migrations from one or more integrated library systems and the issues involved in transferring data.

Cooperative Environment

Catalogers, like other library staff, are accustomed to collaborating with others. Bibliographic records are distributed among institutions and catalogers adapt existing records as well as contribute original records to shared databases. The cataloging process is part of a larger workflow where catalogers interact frequently with other library staff. They know how their work affects other units. This cooperative environment is one that makes catalogers well suited to working with digitization projects and participating at several stages in the digitization process.

Management/Supervisory Skills

Catalogers often have some portion of their assignment delegated to management and supervisory responsibilities. Many catalogers have trained and supervised various levels of staff. Distribution of work is commonly based on criteria such as quality of available cataloging copy and the cataloging, language, and subject expertise of staff. Catalogers are familiar with matching staff to these criteria and determining the appropriate level of staff to perform the work. These same skills can be applied to management responsibilities for metadata creation. Writing documentation and procedures and creating templates are standard routines for catalogers. Utilizing these

same skills, catalogers can develop tools and workforms for metadata creation and guidelines for the definitions of the content in metadata fields.

User knowledge

The cataloger's work has always been user focused and adaptable to changing clientele and their needs. Knowledge of library users helps the cataloger decide the type and level of subject coverage (specific vs. broad), make good judgments in the choice of access points, and provide entries that express relationships between resources. Catalogers apply their knowledge of users in deciding if the standard LC subject heading is sufficient for access to a collection or if additional thesauri such as *Art and Architecture Thesaurus* would be more appropriate and enhance retrieval.[26] Catalogers should be brought into the digitization process at the planning stages where they learn the purpose of the collection, who the potential user base is, and how these users will search for these items. At this stage, they can assess the user needs and develop workflows and staffing.

BENEFITS TO CATALOGERS

Benefits to catalogers will vary based on their level of involvement. By participating in collaborative digitization projects catalogers can increase their visibility within and outside the library community. This visibility can assist in eliminating some of the stereotypical images of catalogers. Collaboration with other organizations "has led to increased contacts among the partner organizations, which serve as a support network and jumping-off point for future projects." [27] Metadata creation also provides an opportunity for catalogers to market their skills, knowledge, and abilities and expand their knowledge of metadata schemes. Participation in metadata projects may assist in

motivating or re-energizing cataloger careers. At ISU, this participation also provides an opportunity for catalogers to think "outside the box" and apply creative solutions to problems. Catalogers have an opportunity to explore uncharted territory, participate in cutting-edge developments, and acquire potentially viable skills for the future. Butterfield reported that University of Michigan catalogers "took away broadened perspectives on new methods of information organization, fresh looks at old assumptions involving information retrieval and organization and a return to a basic understanding of the relationship between access, description, and retrieval."[28] Nero also noted that digitization projects "afford cataloguers the opportunity to demonstrate usefulness and educate colleagues on the evolving role of cataloguers."[29]

FACTORS AFFECTING CATALOGER PARTICPATION IN METADATA CREATION

The case for cataloger involvement in descriptive metadata creation is strong; however, there are still some factors that need to be addressed. These issues fall into several broad, but related, areas: cost, staffing and training.

Costs

The costs of many metadata projects can be quite high. Hudgins points out that staffing constitutes the most costly part of a cataloging metadata project.[30] The average cost of the Library of Congress' National Digital Library/Ameritech Competition was about $19.00 per image. These expenses were equally divided between digital conversion, metadata creation, administration and quality control.[31] Frequently, metadata projects are funded by grants or "soft" money. Grant funding for digitization projects can provide some relief for declining budgets and the means to gain additional library staff.

These projects can also be the catalyst for future donor contributions to the library. Grants may cover conversion, metadata creation, administration and quality control; however, they may not cover any ongoing maintenance. Furthermore, by definition, grants usually have an ending date. In these difficult financial times, the question arises of how many library administrators can allocate or will choose to allocate this much of their budgets to metadata.

Supply of Catalogers

Despite the qualifications catalogers have for metadata creation and participation in digitization projects, the supply of catalogers is currently insufficient to assume on-going projects or meet increased demands for additional projects. The years from 1983 to 2000 witnessed a decrease of 46 percent in the hiring of cataloging professionals.[32] These hiring reductions, coupled with technological advances, have caused many cataloging departments to shrink. These departments are being forced to cope with increased demands and new formats but with the same or fewer staff. If there are fewer catalogers in general, will the creation of descriptive metadata simply be added onto the already heavy workloads of existing catalogers? How do catalogers view this new responsibility? As traditional cataloging is increasingly transferred to paraprofessionals or outsourced, do catalogers see metadata as a source of job security? To incorporate digitization projects into an already full workload, priorities will need to be made. Some materials may need to be outsourced to reutilize staff to work on these new digital endeavors. Some libraries have instituted new digital units to work with metadata.[33] At ISU, metadata creation has been added to the job responsibilities of professional catalogers

while some paraprofessionals are assuming more of the traditional monographic print cataloging.

The appropriate level of staffing is critical in the success of any metadata project.[34] Professional catalogers at ISU who supply subject headings and added entries to metadata records have expressed the need for a staffing level consistent with the level of decision making and subject expertise needed to describe the collections. For example, professional catalogers are less likely to be required if the same set of subject headings will be applied to each slide in a collection. Catalogers also felt a need to be involved at the planning stages of projects.

While cataloger skills are more obvious to those within the library community, they are not as well-known to those outside of it. Digitization projects are currently found in many types of institutions, such as government agencies, non-governmental organizations, museums and historical societies. While these projects may have the participation of a librarian or archivist, many involve individuals who are not aware of the traditional division of labor within the library. The actual work may be performed by individuals who lack a cataloging or even a library science background. In a recent article describing the Colorado Digitization Project, Kriegsman pointed out that both paid staff and volunteers may need to be trained in metadata creation. [35]

Metadata are being created by groups outside the library community using various standards. Institutions may create their own metadata schemas or adapt existing schemas to include data more suited to their users and collections. Some of these communities lack metadata experience and welcome library assistance and experience. Others have made significant developments independent of libraries. For example, metadata activities

in the education community have resulted in a new journal, *Interdisciplinary Journal of Knowledge and Learning Objects Metadata,* and the National Science Digital Library (NSDL) has developed a metadata registry.[36]

Some authors have also expressed concerns about cataloger participation in metadata creation. The primary focus of this criticism is the inflexibility of some catalogers. In order to participate in metadata creation, according to DeZelar-Tiedman and McCue, catalogers need to be more flexible in their approach to standards.[37] They need to extend their knowledge of standards beyond MARC and the 'catalog-centric model.' [38]

Efforts to simplify cataloging and the automation of metadata creation also raise concerns about the future role for catalogers in digitization. The Joint Steering Committee for the Revision of Anglo-American Cataloguing Rules received feedback from the library community on the Part I draft of the new edition of the code. Among other comments, respondents favored a more user-friendly, flexible code that avoided the use of library jargon.[39] While some simplification of the cataloging code is certainly needed, it can also be seen as part of the trend to "dumb down" the cataloging process. Coupled with the simplified Dublin Core metadata standard and the recently developed FAST (Faceted Application of Subject Terminology), one is left to speculate on the necessity of the professional cataloger.[40] Perhaps in the future, library administrators will find it more cost effective to hire subject specialists or lower level staff to create some descriptive metadata.

There are also automated metadata generators such as the experimental Automated Name Authority Control (ANAC) program in use with the Johns Hopkins

University Lester S. Levy Collection of Sheet Music. Using existing metadata records,

this system applies an established algorithm to identify Library of Congress authorized

names. Patton concludes, however, that the automated system was not totally reliable in

all cases. The most effective and cost efficient workflow coupled ANAC with human

oversight. [41] Meta-Extract, developed by the Center for Natural Language Processing at

Syracuse University, is another example of an automated metadata generation system that

has applications for the education community.[42]

Education and Training

Educational issues must be addressed if catalogers are to participate fully in

metadata creation. Many catalogers lack the technical expertise needed to work with

metadata. While the basics of cataloging are the same regardless of the format, the

surrounding issues and information are different. Metadata creators talk of scanner

resolutions, MODS, and crosswalks. Catalogers will need to gain expertise and be able to

converse knowledgeably in these areas if their credibility as significant players in

metadata creation is to be maintained. They will need to understand concepts such as

interoperability and harvesting of data and expand on their knowledge of metadata

schemes. In addition, they may need to be aware of specific metadata applications in

areas such as preservation and the activities of the PREMIS (Preservation Metadata

Implementation Strategies) Working Group.[43] These needs require that catalogers

develop and maintain an open attitude of flexibility towards educating themselves to

acquire these skills. Ahronheim and Marko urge catalogers to involve themselves pro-

actively in digital projects, to be open to other mindsets and to identify those cataloging

values that go outside the library field.[44] Additionally, all participants in any metadata

project need to shift to an atmosphere of shared ownership in the project, where every participant makes a contribution.

Aside from technical information, it is vital that catalogers possess valuable skills and abilities, such as communication, listening and management skills. They will need to be familiar with new products that can assist in metadata creation and be able to assess the advantages and disadvantages of metadata management software.

CONCLUSION

Digitization programs in academic libraries require significant investments in cost, staffing, time, and resources. Catalogers already possess many of the specific skills suited to this activity and they are in a position to make a significant contribution to all phases of digitization projects. Currently, however, the actual extent of cataloger involvement in these projects is difficult to determine as the literature on the issue of staffing for metadata creation is sparse. The majority of articles is devoted to the technical aspects of metadata, such as standards and debates on various schemas. This is indicative of the evolving nature of metadata.

Since digitization is still a developing area, more study is needed on the workflow and personnel issues in metadata creation. In particular, this research should focus on the nature and scope of actual cataloger involvement in metadata creation. This is an important part in assessing the current and future role of the cataloger in academic libraries. Additional studies of cataloger position responsibilities in job advertisements can aid in this assessment. More discussion is also needed on how traditional cataloging skills can easily be adapted to the creation of metadata. Documentation detailing the process of preparing catalogers for this expanded role would be useful. Other topics for

exploration are project costs, benefits to catalogers, and future role of digitization in academic libraries. The success of metadata in retrieval and the impact of technological advances in automated metadata generation are two other areas that need further study.

The future of technical services in general and cataloging in particular is in a state of flux. El-Sherbini writes, "If technical services will not promote catalogers and redefine the role of catalogers in organizing information, the library profession will no longer be able to retain control over this critical function."[45] Cataloger participation in the digitization process is a step toward achieving this objective.

ENDNOTES

[1] Judith M. Panitch, *Special Collections in ARL Libraries*. (Washington, D.C.: Association of Research Libraries, 2001).

[2] Chad M. Kahl and Sarah C. Williams, "Accessibility of ARL Academic Libraries' Digital Library Projects," In *Internet Librarian 2004: Collected Presentations, November 15-17, 2004, Monterey Conference Center, Monterey, California*, compiled by Carol Nixon and Jennifer Burmood (Medford, N.J: Information Today, 2004): 159-64.

[3] Janet Swan Hill, "Analog People for Digital Dreams: Staffing and Educational Considerations for Cataloging and Metadata Professionals," *Library Resources & Technical Services* 49, no. 1 (January 2005): 14-18.

[4] Association for Library Collections & Technical Services, Committee on Cataloging: Description & Access, Task Force on Metadata, "Final Report," June 16, 2000, http://www.libraries.psu.edu/tas/jca/ccda/tf-meta6.html (accessed December 16, 2005)

[5] In April 2005 professional catalogers at Iowa State University (ISU) began participating in the cataloging of digital objects which included a collection of lantern slides and photographs. To date, their main responsibility is providing Library of Congress (LC) subject headings and AACR2 constructed access points. This information is entered into a work form which is based on Visual Resource Association (VRA) core categories and contains the description of the object. (http://www.vraweb.org/vracore3.htm (accessed December 16, 2005)). The ISU library uses Luna Imaging software and the images and the metadata created are accessible through the library's portal called Multi-Search.

(http://www.lib.iastate.edu:8080/zportal/zengine?VDXaction=ZSearchSimple (accessed December 16, 2005))

[6] Joan Leysen, e-mail to Autocat listserv, May 6, 2005; Jeanne Boydston, e-mail to Serialst listserv, May 6, 2005.

[7] Association for Library Collections & Technical Services Continuing Education Task Force, "Continuing Education for Catalogers: Summary of Survey Responses," March 31, 2003, http://darkwing.uoregon.edu/~chixson/cetf/surveyresults.html (accessed December 16, 2005)

[8] Brad Eden, "Report on the ALCTS Heads of Cataloging Departments Discussion Group, American Library Association Midwinter Conference, Philadelphia, January 2003," *Technical Services Quarterly* 21, no. 2 (2003): 76-79.

[9] JoAnne Deeken, e-mail to Autocat listserv, May 27, 2005 ; Judith Hopkins, e-mail to Autocat listserv, June 15, 2005.

[10] Ingrid Hsieh-Yee, "Cataloging and Metadata Education: A Proposal for Preparing Cataloging Professionals of the 21st Century. A Response to Action Item 5.1 of the 'Bibliographic Control of Web Resources: A Library of Congress Action Plan,'" submitted to the ALCTS/ALISE Task Force, Final Report, December 2002; Web Version, April 2003," http://www.loc.gov/catdir/bibcontrol/CatalogingandMetadataEducation.pdf (accessed December 16, 2005) ; Ingrid Hsieh-Yee, "Cataloging and Metadata Education in North American LIS Programs," *Library Resources & Technical Services* 48, no. 1 (Jan. 2004): 59-68.

[11] "DLEP: Digital Libraries Education Program, Indiana University Bloomington,

University of Illinois [at] Urbana-Champaign,"

http://lair.indiana.edu/research/dlib/details/index.php (accessed December 16, 2005)

[12] Nadine P. Ellero, "The Name and Role of the Cataloger in the Twenty-First Century,"

In *Innovative Redesign and Reorganization of Library Technical Services: Paths for the*

Future and Case Studies, edited by Bradford Lee Eden (Westport, Conn.: Libraries

Unlimited, 2004): 119-58.

[13] "Colorado Digitization Program," http://www.cdpheritage.org/ (accessed December 16,

2005)

[14] Cornell University Library, "Metadata Services,"

http://www.library.cornell.edu/cts/metadataservices/ (accessed December 16, 2005) ;

University of Oregon Libraries, "Metadata and Digital Library Services,"

http://libweb.uoregon.edu/catdept/home/ (accessed December 16, 2005 ; University of

Tennessee, University Libraries, "Technical Services and Digital Access,"

http://www.lib.utk.edu/techserv/digacc.html (accessed December 16, 2005)

[15] Jean Hudgins and Lisa A. Macklin, "New Materials, New Processes: Implementing

Digital Imaging Projects into Existing Workflow," *Library Collections, Acquisitions &*

Technical Services 24 (2000): 189-204.

[16] Char Simser and Miriam Childs, "Revolutionary Relationships: Cataloger' Liaison

Role as Metadata Experts in the Creation of the K-State Digital Library," *Serials*

Librarian 44, no. 3-4 (2003): 223-8.

[17] Arlene Hanerfeld, e-mail message to authors, May 9, 2005.

[18] "Iowa Heritage Digital Collections," http://www.iowaheritage.org/ (accessed December 16, 2005) ; "Colorado Digitization Program." ; "Western Waters Digital Library," http://westernwaters.org/ (accessed December 16, 2005)

[19] Kody Janney, "Collaborative Cataloging: Using Dublin Core to Unite Local Heritage Organizations," *Journal of Internet Cataloging* 7, no.1 (2004), doi:10.1300/J141v07n01_03, http://dx.doi.org/10.1300/J141v07n01_03

[20] Sue Kriegsman, "Catalog Training for People Who Are Not Catalogers: The Colorado Digitization Project Experience," *Cataloging & Classification Quarterly* 34, no. 3 (2002): 367-74 ; Janney, "Collaborative Cataloging."

[21] Mary S. Woodley, "A Digital Library Project on a Shoestring," *Library Collections, Acquisitions & Technical Services* 26 (2000): 199-206.

[22] Jane Greenberg and W. Davenport Robertson, "Semantic Web Construction: An Inquiry of Authors' Views on Collaborative Metadata Generation," In *Proceedings of the International Conference on Dublin Core and Metadata for e-Communities, Oct. 13-17, 2002* (Firenze, Italy: Firenze University Press, 2002): 45-52.

[23] Bradford Lee Eden, "Technical Services: A Vision for the Future," *Library Computing* 18, no. 4 (1999): 292.

[24] Christine DeZelar-Tiedman, "Crashing the Party: Catalogers as Digital Librarians," *OCLC Systems & Services: International Digital Library Perspectives* 20, no. 4 (2004):146. doi:10.1108/10650750410564600, http://dx.doi.org/10.1108/10650750410564600

[25] Michael A. Chopey, "Planning and Implementing a Metadata-Driven Digital Repository," *Cataloging & Classification Quarterly* 40, no. 3-4 (2005), doi:10.1300/J104v40n03_12, http://dx.doi.org/10.1300/J104v40n03_12

[26] *Art & Architecture Thesaurus*. 2nd ed. (New York, N.Y.: Oxford University Press, 1994).

[27] Janney, "Collaborative Cataloging," 46.

[28] Kevin L. Butterfield. "Cataloger's [sic] and the Creation of Metadata Systems: A Collaborative Vision at the University of Michigan, OCLC Internet Cataloging Project Colloquium Position Paper," http://webdoc.sub.gwdg.de/ebook/aw/oclc/man/colloq/butter.htm (accessed December 16, 2005)

[29] Lorraine M. Nero, "Cataloguing Digital Resources: The Experience of the University of the West Indies, St. Augustine Campus," *Library Review* 54, no. 2 (2005): 107. doi:10.1108/00242530510583048, http://dx.doi.org/10.1108/00242530510583048

[30] Jean Hudgins, Grace Agnew, and Elizabeth Brown, *Getting Mileage Out of Metadata: Applications for the Library,* LITA guides, no. 5 (Chicago, Ill.: American Library Association, 1999).

[31] Steven Puglia, "The Costs of Digital Imaging Projects," *RLG DigiNews* 3, no. 5 (Oct. 15, 1999), http://www.rlg.org/preserv/diginews/diginews3-5.html#feature

[32] Stanley J. Wilder, *Demographic Change in Academic Librarianship*. (Washington, D.C.: Association of Research Libraries, 2003).

[33] Eden, "Report on the ALCTS Heads of Cataloging Departments Discussion Group." ; Cornell University, "Metadata Services." ; University of Oregon Libraries, "Metadata and Digital Library Services."

[34] Hudgins, Agnew, and Brown, *Getting Mileage Out of Metadata.*

[35] Kriegsman, "Catalog Training for People Who Are Not Catalogers."

[36] "Interdisciplinary Journal of Knowledge and Learning Objects," http://ijklo.org/ (accessed December 16, 2005) ; "NSDL Metadata Registry," http://eg2.ischool.washington.edu/registry (accessed December 16, 2005)

[37] DeZelar-Tiedman, "Crashing the Party: Catalogers as Digital Librarians." ; Janet A. McCue, "Why Should a Cataloging Department Hire a Metadata Specialist? and, Are There Any Out There?" *Quarterly Bulletin of the International Association of Agricultural Information Specialists* 42, no. 3-4 (1997): 226-9.

[38] Judith Ahronheim and Lynn Marko, "Exploding Out of the MARC Box: Building New Roles for Cataloging Departments," *Cataloging & Classification Quarterly* 30, no. 2/3 (2000): 217-25.

[39] Joint Steering Committee for Revision of Anglo-American Cataloguing Rules. "Historic Documents," http://www.collectionscanada.ca/jsc/0504out.html (accessed December 16, 2005)

[40] Rebecca J. Dean, "FAST: Development of Simplified Headings for Metadata," *Cataloging & Classification Quarterly* 39, no. 1-2 (2004): 331-52.

[41] Mark Patton, et. al., "Toward a Metadata Generation Framework: A Case Study at Johns Hopkins University," *D-Lib Magazine* 10, no. 11 (November 2004),

http://www.dlib.org/dlib/november04/choudhury/11choudhury.html (accessed December 16, 2005)

42 Elizabeth Liddy, "Metadata: A Promising Solution," *EDUCAUSE Review* (May-June 2005): 10-11.

43 "Preservation Metadata for Digital Materials,"

http://www.oclc.org/research/projects/pmwg/background.htm (accessed February 22, 2006)

44 Ahronheim and Marko, "Exploding Out of the MARC Box."

45 Magda El-Sherbini, "Technical Services Between Reality and Illusion: Reorganization in Technical Services at the Ohio State University Libraries-Questions and Assessment," In *Innovative Redesign and Reorganization of Library Technical Services: Paths for the Future and Case Studies*, edited by Bradford Lee Eden (Westport, Conn.: Libraries Unlimited, 2004): 396.