Editorial: Librarians of the Future

Mary Beth Weber

I recently completed a survey administered at my library to obtain feedback regarding what qualifications and personal qualities librarians will need by the year 2023. A summary of the survey revealed that my colleagues identified technology, teaching, scholarly communication, subject expertise, and project management as the top five essential skills that librarians must develop, through training or hiring, by 2023. Collections and discovery, and metadata were ranked as six and seven, respectively. The top five personal qualities that my colleagues felt librarians must possess by 2023 were adaptability, flexibility, intellectual engagement, collegiality, and creativity.

The survey led me to consider how libraries and technical services work have evolved since I became a librarian in the late 1980s. Card catalogs have been replaced by integrated library systems, searching evolved from librarian-mediated searches of databases provided by vendors (such as Dialog and BRS) to end-user searching; reference queries are often fielded via email or chat. We do much of our work electronically, and some services once exclusively provided by librarians, such as collection development, resource description, or acquisitions, are purchased from vendors or have been automated. Newer services we developed to meet emerging needs now compete with traditional services for which there is still a demand. Despite these shifts, our workloads are often heavy.

Vacancies are rarely filled using the position description used by the last person who occupied that position. Positions frequently transfer to other parts of the library because administrators may view technical services work as routine and will eventually become automated, outsourced, or obsolete. Former librarian positions may be switched to staff because a well-trained staff person can do the work. Each vacancy at my institution is reviewed and revised to better meet current and anticipated future needs.

Established institutions change over time. Online courses and college degree programs have grown, and this trend continues with MOOCs (massive open online courses). As a parent, I have seen firsthand how schools have changed. Parents communicate with teachers differently; in-person visits and phone calls have largely been replaced by email exchanges. Promethean boards, tablets, and e-books are now the norm for students, replacing notebooks and print textbooks. Libraries have also adapted and evolved. Many libraries offer streaming media and e-books that may be checked out or downloaded. How libraries are used has also changed. Libraries, once a quiet place reserved for reading, research, or story hour, are now a hub of activity for group study, community activities, meetings, and so on. Along those lines, librarians have also changed. We have new titles that sometimes entail new responsibilities. Metadata librarians provide resource description. One of my Facebook friends reported that her title changed from Assistant Director of Collections and Technical Service to Assistant Director for Discovery and Technology Services. In a few short years, we have integrated social media into our work, especially for

professional networking and publicizing our professional associations. Examples include the RDA Café on Facebook and ALCTS' YouTube channel videos. We use LibGuides for our documentation and for communicating with others in our libraries.

As libraries continue to evolve in light of budget shortfalls and changing user habits, we need to consider the future of our profession and the services we provide. I attended a presentation at the 2013 American Library Association Annual Conference that discussed how one institution devolved its technical services department because of changing organizational priorities. Rather than seeing this as a threat to our profession, we should recognize it as an opportunity to examine realities (funding, staffing, efficiencies), to influence policies and outcomes (vendor supplied services, standards), and to help shape the future of our profession and to mentor our newer members. We have been flexible as changes have occurred, and will adapt to changing user needs and work requirements.

A non-librarian friend told me about an article that he read (he failed to give me the citation) that cited things that will become obsolete in the future, and libraries were included on the list. Libraries and librarians as known to us will surely change, yet the need for information—organizing it, enabling access to it, preserving it, and enriching it— will not change.

On that note, I would like to draw your attention to the contents of this issue of *Library Resources & Technical Services*:

- ALCTS President Carolynne Myall's annual report. ALCTS has had a busy and productive year, and I trust you will find her report to be quite informative.
- Stacie Traill discusses a study undertaken at the University of Minnesota regarding record quality of e-monograph record sets in her paper "Quality Issues in Vendor-Provided E-Monography Records." The goal was to improve and increase the efficiency of pre-load editing processes. An analysis of the study led to identification of future challenges for maintaining quality in batchloaded record sets, and Traill suggests suggests ways to improve record quality.
- In "Shared resources, shared records: letting go of local metadata hosting within a consortium environment," Charles Pennell, Natalie Sommerville, and Derek Rodriguez discuss the Triangle Research Library Network's discovery layer, which supports group and individual library catalog interfaces for its

four member libraries. Their paper discusses how the member institutions build and maintain record sets for commonly held electronic collections for the benefit of the consortium.

Editorial Board Changes

The membership of the *LRTS* editorial board changes at the conclusion of the ALA Annual Conference. I want to take this opportunity to thank outgoing board members Elise Calvi, Birdie MacLennan, and Elaine Westbrooks for their fine work and input. Each of them has served two two-year terms, and they will be missed. Oksana Zavalina concluded a one-year term as an intern, and she will continue as a board member. I appreciate her insightful reviews and perspective. I want to acknowledge the tremendous contributions (both in terms of reviews and discussions) of continuing board members Everett Allgood, David Banush, Sian Brannon, Steven Carrico, Christopher Cronin, Nadine Ellero, Andrew Hart, Steven Knowlton, Philip Schreur, Anne Sleeman, Lori Terrill, and Lynn Wiley. You have helped me to grow into my new role as *LRTS* editor. I also acknowledge the contributions of Book Review Editor Norm Medeiros, ALCTS News Editor Alice Platt, and ALCTS Staff Liaison Christine McConnell. They provide balance and an additional perspective for our work. Lastly, it is with great pleasure that I welcome new board members Karen E. K. Brown, Lisa German, Virginia (Ginger) Williams, and intern Barry Brown. I look forward to working with them.

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Association for Library Collections and Technical Services Annual Report 2012–13

Carolynne Myall, 2012–13 ALCTS President

Through education, discussion, publishing, and collaboration, the Association for Library Collections and Technical Services (ALCTS) leads in developing standards and best practices for selecting, identifying, acquiring, organizing, managing, retrieving, and preserving recorded knowledge. In the dynamic library environment, ALCTS's mission is ambitious. Maintaining effectiveness in its pursuit requires flexibility, creativity, persistence, and an organizational culture of continuing revitalization. ALCTS members' activities this year demonstrate that brave inventiveness. Below is a summary, arranged under the four Critical Issues Areas identified in ALCTS's innovative strategic plan.

Explaining What We're About and What We Do

At the 2012 American Library Association Annual Conference, adopting recommendations of the Advocacy Task Force chaired by Mary Beth Weber, the ALCTS board of directors agreed in principle to establish two groups to address advocacy issues within the context of ALCTS. This year, we implemented the groups, which made considerable progress on their charges.

First, to assist members in demonstrating and articulating the value of library functions in ALCTS's areas of interest, we formed a temporary group, the Technical Services Advocacy Resources Task Force. This task force, chaired by Louise Ratliff, compiled a collection of facts, websites, "elevator speeches," and other resources for members' use in their libraries, which are available on the ALCTS website.

Second, the board established a division-level standing committee, the Advocacy Coordinating Group, to enable ALCTS to play a proactive, effective role in policy development and legislative influence. The new committee, chaired by Olivia M. A. Madison, will scan the environment for policy discussions and decisions falling within ALCTS's areas of interest, recommend positions and prompt action, and provide coordination with other groups. Through the activities of the Advocacy Coordinating Group, we hope to bring ALCTS expertise to a variety of pertinent policy discussions.

Preservation Week, now an ALCTS signature event, provided opportunities for libraries to connect with members of their communities by helping them preserve their personal, family, or community heritage. Held April 21–27,

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Preservation Week 2013 featured noted author Steve Berry as a spokesperson; Berry's enthusiasm for the event has helped raise its profile. Registration at free webinars on family photographs, archives, and personal digital archiving totaled 2,500 individuals. An event tracker listed sixty-four events held by sixty-one organizations. Online flyers provided new content targeted to military families. "Dear Donia," featuring an ALCTS member giving preservation advice, launched with a live Facebook chat session. In these activities and more, Preservation Week explained what we are about by demonstrating it.

Improving How We Operate

ALCTS continually reviews its structure and operations, and it seeks members' input regarding ways to improve. This year, in response to member concerns about travel while enhancing committee effectiveness, we implemented a new appointment cycle requiring members of most division committees to attend face-to-face meetings only at the ALA Annual Conference. We hope the new cycle enables more individuals to serve on committees, and frees members who attend the ALA Midwinter Meeting to participate in interest group discussions and other educational and networking events. With committee membership overlapping at the ALA Annual Conference, the new cycle should also provide greater continuity for effective virtual functioning throughout the year. We will continue to explore organizational changes and new types of committee structures—such as the Continuing Education Committee's Technical Support Group for webinars and virtual meetings—that enhance members' ability to participate in delivering ALCTS programs and services.

In response to member suggestions, we adopted a dues category for retired members, sent additional reminders to solicit volunteers, and worked toward automatic follow-up of non-renewing members. We implemented a review process for sections (our major organizational unit), and "tweaked" a new position, the Interest Group Coordinator, to take further advantage of this successful innovation. ALCTS Executive Director Charles Wilt conducted a survey of current award jury chairs to gather their thoughts about our awards process. Along with information from other parts of ALA, we used jury chairs' observations to clarify our awards procedures and make them more consistent. ALCTS members, the board is listening to you!

ALCTS led the way within ALA in proposing a digital repository for preserving and providing access to association documents. This year ALCTS participated with other divisions in contracting with the University of Illinois for a digital archive. During the coming year, ALCTS members will provide their expertise as we undertake its implementation.

Sustaining ALCTS as a Vibrant, Relevant Organization

In July 2012, the ALCTS Publishing Review Task Group, chaired by Mary Case, submitted its final report, which includes a scan of our publishing environment, a proposed mission and vision for the ALCTS publishing program, and fifteen specific recommendations to revitalize it, on topics ranging from organizational changes to open access policy development. The board, the Publications Committee, ALCTS staff, and others reviewed this comprehensive report. All recommendations of the task group have now been implemented or are at some point in the implementation process. To add further data to the discussion, an Emerging Leaders project identified three possible financial models for *Library Resources & Technical Services* (*LRTS*); and in summer 2013, the division surveyed division leaders about their attitudes toward open access policy for ALCTS publications. Though full implementation of the Publishing Review Group's recommendations will take time, we are already seeing positive results in our publishing program and are moving toward adopting a division policy regarding open access and ALCTS publications.

ALCTS's continuing education program was busy and successful. Web courses on topics such as acquiring electronic resources and collection assessment were offered throughout the year. The Continuing Education Committee presented more than twenty webinars on topics ranging across ALCTS's areas of interest, with total registration of 3,000 individuals and 465 groups. Webinars offered at reasonable cost generated an important stream of revenue for ALCTS; nonetheless, after just a few months, ALCTS webinars continued to become available at no charge on the ALCTS YouTube site. The popular E-Forum series, always available at no charge to participants, provided opportunities for diverse library staff to discuss e-book acquisition, RDA training, the role of the professional in library technical services, and other current topics of interest to technical services professionals.

ALCTS presented both face-to-face and virtual preconference and conference programs. A conference highlight at the Annual Conference was the ALCTS President's Program, "Confessions of a Digital Packrat," presented by Erin McKean, founder of Wordnik.com, former editor-in-chief of American Dictionaries for Oxford University Press, and blogger on sewing and dresses.

The Transforming Collections Task Force continued

to offer microgrants to support innovative projects involving emerging technologies and collections in libraries. The microgrant project will continue through 2015.

Supporting Standards Development, Implementation and Dissemination

In May 2013, the Standards Task Force—charged to identify gaps in current ALCTS standards coverage and suggest ways to create a more comprehensive, division-level approach to standards development—submitted its final report. Among the accomplishments of this task force, chaired by Cindy Hepfer, is a remarkable set of appendixes, including a glossary, recommended reading, and lists of pertinent organizations and ALCTS-related standards by topic. These resources should immediately prove useful to ALCTS members. Adopting the task force's recommendations, which include formation of a division-level committee and various mechanisms for building awareness of standards, will position ALCTS to lead and more effectively participate in developing standards in ALCTS functional areas.

This year also saw full implementation of the Metadata Standards Committee, established in principle in June 2012, as a new joint ALCTS-LITA entity, with a liaison from RUSA. The committee will play a leadership role in creating and developing metadata standards for bibliographic information.

Using a broader definition of "standards," the Advocacy Coordinating Group, in bringing ALCTS voices and expertise to many policy discussions, will also contribute to ALCTS' role in the area of standards development. Through the interactions of the Standards Committee, the Metadata Standards Committee, and the Advocacy Coordinating Group with others, we also hope to improve structures for working with other divisions on common interests and issues, including standards.

Using a still broader definition, ALCTS awards help establish professional standards through identifying excellence in personal performance. Barbara Tillett, retired from the Library of Congress, received the Ross Atkinson Lifetime Achievement Award for her distinguished contributions to the literature and for her service to ALCTS and the international cataloging community. Philip Evan Schreur received the Edward Swanson Memorial Best of *LRTS* Award for "The Academy Unbound: Linked Data as Revolution." Among ALCTS awards for new professionals, the Esther J. Piercy Award was given to Xan Arch of Reed College. Information about the outstanding recipients of these and other ALCTS awards for 2013 is available on the ALCTS website (www.ala.org/alcts/awards).

The Coming Year and the Past Year

During the coming year, to continue our revitalization project, we will examine the topic of programming, broadly conceived, particularly in the light of changes in ALA conference scheduling and expectations, virtual opportunities, and the contributions of interest groups to this area. We will continue to seek connections with new members of the profession, particularly in emerging digital specialties and in underrepresented functions or types of libraries. We are concerned about the effects of ALA's budget situation across the association, and we will work to develop a culture of responsibility for revenue generation in ALCTS to enable our division to continue to contribute to the profession and to members' professional lives.

Success in ALCTS's varied array of activities requires vision, planning, many dedicated member volunteers, and outstanding staff. Thank you to Executive Director Charles Wilt and to staff members Christine McConnell and Julie Reese for direction, support, and patience. Thank you to the many members who provided leadership (both formal and informal), insight, ideas, and hard work. During the past year, we have continued previous initiatives and, I hope, made progress in establishing new means of bringing ALCTS voices and perspectives to the development of the profession and the services ALCTS members provide. I am honored to have had a part in this process.

Identifying Significant Changes in Serials with Title Changes in the Recognition of New Works

Mavis B. Molto

Due to an error during production of vol. 57, no. 3, appendixes were inadvertently omitted from this paper. Since the appendixes are intended to be read in conjunction with this paper, a decision was made to reissue "Identifying Significant Changes in Serials with Title Changes in the Recognition of New Works" in vol. 57, no. 4.—*Ed.*

The purpose of the study was to develop a means for identifying significant subject and function changes in serials with title changes and then to recommend ways to recognize new serial works in cataloging. A sample of serials with title changes was used to classify the underlying subject and function changes found into thirty-five subcategories, which were then each assigned a level (high, medium, or low) according to the evidence provided for a new work. The FRBR (Functional Requirements for Bibliographic Records) concept of a work and other FRBR guidelines were used in assigning the levels. It was determined that three high-level subject changes and one high-level function change provided the best evidence of significant change in recognizing a new work. Tests were performed to determine whether multiple medium-level changes could also be used to identify new works. A recommendation was made to modify the RDA (Resource Description and Access) rules for major change in the title proper of a serial to require a new access point only when a significant subject or function change has occurred in one of the four high-level subcategories identified in the study.

A dilemma for serials catalogers over the years has been the issue of how to treat title changes. When the Anglo-American Cataloguing Rules (AACR2) were revised in 2002, the initial goal was to provide rules requiring new records for serials with title changes only if the serial had become a new work.[1] However, the mechanisms developed to recognize new works fell short of this objective. With the new Resource Description and Access (RDA) cataloging rules now replacing AACR2 in many libraries, the problem continues, since RDA employs many of the same procedures as AACR2. There is renewed emphasis in RDA, however, on the concept of a work because the rules are based on the FRBR (Functional Requirements for Bibliographic Records) conceptual model in which a work plays a prominent role. The work is one of four key entities that represent different aspects of a user's interest in bibliographic data.[2] A work in RDA is defined, as in FRBR, as "a distinct intellectual or artistic creation."[3]

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Submitted November 2, 2012; tentatively accepted pending modest revisions December 5, 2012; revision submitted December 29, 2012, and accepted for publication.

In AACR2, new works are recognized by creating new entries for the manifestations of the new works,[4] whereas RDA represents new works by new access points, along with entries for the new manifestations.[5] The mechanism for recognizing new works in both AACR2 and RDA consists of determining that a major change has occurred, such as certain changes in the words of the title. The major changes that are identified, however, do not correlate with the changes that would be recognized if using a definition of a work that explains what a work is and how it can be recognized. Thus there is no assurance that the new entry or access point will represent a new work.

In a previous study, the author developed a preliminary procedure for recognizing new works for serials with title changes, using the FRBR definition of a work and additional FRBR guidelines.[6] The study found that only two kinds of changes, namely, subject changes and function changes, provide the evidence needed to recognize a new work. The FRBR requirement that a significant change must occur was not addressed, this being beyond the scope of the study.

There is a need to address the issue of significant change in serials with title changes. The current study, a follow-up to the study noted above, will consider this problem and attempt to develop a means by which significant subject and function changes can be identified. Knowing how to discern significant changes in serials will provide a tool that could improve cataloging rules for serials. No study was found that addressed this issue.

The purpose of the study was to develop a means for identifying significant subject and function changes in serials with title changes and to recommend changes in cataloging rules for recognizing new serial works. The study was limited to serials that had title changes and did not address other kinds of changes in serials (e.g., changes in responsibility) that might also lead to the recognition of a new work. The study is expected to contribute to the theoretical body of knowledge concerning serials with title changes. It also will have a practical application in providing data that can be used to improve cataloging rules, specifically the RDA rules.

Literature Review

The literature review was concerned with three areas relating to the proposed research: (1) how to define a serial work, (2) how cataloging rules determine when a new record or access point should be created for a serial with a title change, and (3) the characteristics of serials with title changes.

Concept of a Work in the Library Catalog

There are various views on how to define a work for the library catalog, as well as differences in how cataloging rules treat this issue. AACR2 does not provide a definition of a work, whereas in RDA the FRBR definition is used. The FRBR conceptual model, on which RDA is based, was developed by a study group of the International Federation of Library Associations and Institutions (IFLA) which published a report titled *Functional Requirements for Bibliographic Records*. The report includes the following background on the concept of a work:

> A *work* is an abstract entity; there is no single material object one can point to as the *work*. We recognize the *work* through individual realizations or *expressions* of the *work*, but the *work* itself exists only in the commonality of content between and among the various *expressions* of the *work*. . . . Because the notion of a *work* is abstract, it is difficult to define precise boundaries for the entity. The concept of what constitutes a *work* and where the line of demarcation lies between one *work* and another may in fact be viewed differently from one culture to another.[7]

The difficulty in coming to a common agreement on what constitutes a work is seen in the different views expressed in a special issue of *Cataloging & Classification Quarterly* that was devoted to the concept of a work in the modern catalog.[8] Smiraglia, editor of the volume, also wrote a subsequent article in which he identifies critical elements of definitions of works by authors from Panizzi (1841) and onward.[9] Views on the more specific concept of a serial work have been proposed by some authors, with an overview of some of these views following.

Some have taken a strong stand on the importance of the user's perceptions and needs in creating guidelines for recognizing new serial works. Layne and Antelman both note that neither the librarian nor library users would see a new work in the records created by cataloging rules.[10] Antelman suggests that a new work identifier is needed for serials, since neither name nor title are reliable identifiers of a serial work. She proposes the concept of bibliographic families to group records for related serials in the library catalog.[11]

Yee and Kuhagen voice similar concerns, with Yee suggesting that not only could the title and author change, but the intellectual and artistic content could be changed without the serial becoming a new work.[12] She proposes: "As a rule of thumb, consider two items to be the same work if they would be considered interchangeable by most users, or if a user seeking one would actually find the other preferable (as in the case of a later revised edition)."[13] Kuhagen suggests that users' needs in finding and selecting serials would be best supported if serials with changed titles were treated as single works, whereas mergers and splits could be treated as different works.[14]

Adams and Santamauro take an approach similar to Antelman's, proposing that instead of identifying works, one should identify superworkspressions.[15] This concept, derived from FRBR principles, draws on the work of Frieda Rosenberg and Diane Hillman.[16] Adams and Santamauro suggest that an umbrella record could be created for each superworkspression, containing all of the bibliographic information pertaining to the resource regardless of format. Manifestation records, specific to particular formats, would stem from the umbrella record, with item records branching off from the manifestation record. The authors propose doing away with the current practice of successive entry cataloging, which requires a new record for every major change in title or format. New umbrella records would be created only when there has been a change in content. The authors acknowledge that it may prove difficult to determine when content has changed sufficiently to identify a new superworkspression.[17]

History of Serials Cataloging Rules

There has been a move, as cataloging rules have been revised, to require a new record or access point only when a new work has emerged. However, cataloging rules do not always include the guidance that could be provided by a specific definition of a work. A brief overview of the major cataloging conventions used for serials follows.

Hirons provides a succinct description of the three conventions that have been used historically for cataloging serials:

- Earliest entry: all changes are kept on a single record with the description based on the earliest issue and title changes, etc. recorded in notes;
- Latest entry: all changes are kept on a single record with description based on the latest (most recent) issue and earlier titles, etc. given in notes;
- Successive entry: a new record is made for each title or other major change (e.g., main entry); description is based on the latest issue (AACR1) or the earliest issue (AACR2).[18]

As Jones notes, different works will be identified for the same serial, depending on which of these conventions is applied.[19]

Both RDA and AACR2 are based on the concept of successive entry.[20] There is continuing debate, however, on the merits of successive entry cataloging versus maintaining a single record or access point for serials with title changes. A special concern with successive entry is that excessive numbers of records or access points are often required. The single record approach is proposed by Lim as a way to limit the number of records created, with the suggestion that separate records be created for titles resulting from mergers or splits.[21] Hirons and Graham believe that successive entry cataloging fills a need, but propose that new records be created only when there has been a substantial change in the serial.[22] The pros and cons of successive versus latest entry cataloging are discussed in a collection of articles, edited by Mary Curran and titled "Mission Accomplished? A Symposium on Latest vs. Successive Entry."[23] The four contributors conclude that a system solution is needed, either via FRBR or a next-generation catalog.

Characteristics of Serials with Title Changes

Cataloging rules, as noted above, employ varying procedures for determining when new records or access points should be created for serials with title changes. Before procedures can be developed, however, it seems that one must understand the changes that occur in serials when a title changes, so the procedures can specify the kinds of changes that would warrant the recognition of a new work. In a previous article, the author identified several studies that investigated the reasons for serial title changes, but found that none of the studies looked at how the information could be used to inform the task of creating or revising cataloging rules. A research study was therefore conducted by the author to identify the characteristics of serials with title changes, with the goal of providing input for improving cataloging rules.[24] It was determined that 80.8 percent of the underlying changes that occur in serials with title changes are for subject or function changes. It was further determined that to identify new works for serials with title changes, using the FRBR concept of a work as a guide, a significant subject or function change must occur. The recognition that significant change must occur correlates with a comment by Adams and Santamauro that a sufficient change in content is needed for a new superworkspression record to be created.[25] How to recognize significant change in serials is a topic not addressed in these studies.

Summary of the Literature

In summary, there are differing views on what constitutes a serial work. Cataloging rules likewise differ in how a serial work is viewed, with some cataloging codes providing no definition of a work and no rationale for the access points and entries that are created. Some individuals who have commented on this issue believe that new records and access points for serials with title changes should be created only when there has been sufficient or substantial change in the serial. How to identify substantial change in a serial has not been addressed in the literature.

Method

Conceptual Framework

The purpose of the study was to develop a means for identifying significant subject and function changes in serials with title changes and then to recommend changes in cataloging rules for recognizing new serial works. The research was descriptive and exploratory. The RDA definitions of a work and of a serial were used. Thus, a serial was defined as "a resource issued in successive parts, usually bearing numbering, that has no predetermined conclusion (e.g., a periodical, a monographic series, a newspaper)."[26] A work, as previously noted, was defined as "a distinct intellectual or artistic creation (i.e., the intellectual or artistic content)."[27] This definition corresponds with the definition used in the FRBR model that forms the conceptual basis for the RDA rules.[28] A subject change was defined as "a change in the serial's topical content" (e.g., a change from zoology to biology). A function change, in turn, was defined as "a change in the serial's character or purpose" (e.g., a change from a bulletin to a journal).

The goal of developing a means for identifying significant subject and function changes in serials with title changes was achieved by seeking answers to three questions:

- First, what are the broad subcategories into which subject and function changes in serials with title changes can be divided? It was assumed that the subcategories would provide a broad grouping of the kinds of changes that occur in serials with title changes. The subcategories could then be evaluated in the subsequent step.
- Second, what level of evidence is provided by each subcategory of subject and function change in recognizing a new serial work? It was expected that the assignment of a level to each subcategory would enable one to know how the changes represented by the subcategory would contribute to the recognition of a new work, with higher level changes contributing most. This information would provide a tool that could be used in the next step.
- Third, which of the subcategories, or combinations of subcategories, of subject and function change would provide evidence of a significant change, needed to recognize a new serial work? It was anticipated that the information gathered above could be used to develop various approaches for recognizing new works. An assumption was made that the approaches for identifying new works must be practical and cost effective, due to limited cataloging budgets.

In summary, the research questions were:

- What are the broad subcategories into which subject and function changes in serials with title changes can be divided?
- What level of evidence is provided by each subcategory of subject and function change in recognizing a new serial work?
- Which of the subcategories, or combinations of subcategories, of subject and function change provide evidence of a significant change, needed to recognize a new serial work?

Sample

The sample used in the study was from the author's previous study of serials with title changes mentioned above. This sample was chosen so the current study could enlarge on the recommendations made in the previous study. The sample was taken from JSTOR—short for Journal Storage (www.jstor.org)—an online database archive of full-text digitized back issues of academic journals, including various kinds of serials, such as bulletins, reviews, annuals, newsletters, yearbooks, and proceedings. Four JSTOR collections were included in the sample: Arts and Sciences I, Arts and Sciences II, Arts and Sciences III, and Life Sciences. These collections covered a variety of disciplines, including the humanities, social sciences, language, literature, and life sciences. Non-English serials were excluded, as were serials consisting of splits or mergers, since the latter were already considered to be different works and did not require further analysis. Serials for which no explanation of the title change was found in the text were also excluded, leaving 120 serials. In the current study, only the serials in which a subject or function change occurred, relevant to the title change, were considered. This caused twenty-three serials to be excluded, leaving ninety-seven serials in the final sample. The majority of the resulting serials were from the 1900s. A list of the serials is found in appendix A, by the title to which the serial was changed. Due to the nature of the sample, with a focus on academic serials, there may be limitations in generalizing the findings.

Procedure for Identifying Subject and Function Subcategories

The first research question was (A): What are the broad subcategories into which subject and function changes in serials with title changes can be divided? To answer this question, the descriptions of why titles change, identified in the previous study, were used. These descriptions were derived from statements occurring in the text of the serials. For example, the reason for a title change might have been due to a broadening of the subject content (e.g., from zoology to biology), or a change in function (e.g., from a newsletter to a journal).

Some descriptions were reworded to create consistency for better grouping of the descriptions. Only the 179 descriptions relating to subject and function changes were examined. The following steps were performed:

1. Identified subject subcategories
   - Created a list of all descriptions pertaining to subject changes in the serials
   - Grouped the descriptions into subcategories based on the wording and intent of the descriptions (see appendix B)
2. Identified function subcategories
   - Created a list of all descriptions pertaining to function changes in the serials
   - Grouped the descriptions into subcategories based on the wording and intent of the descriptions (see appendix C)

In the initial attempt to develop subcategories for the subject and function changes, broad groupings were created, consisting of eight to ten subcategories of subject changes and eight to ten subcategories of function changes. The wording of the descriptions was used as much as possible to create the groupings. The resulting subcategories were later subdivided further so finer distinctions could be made, allowing greater flexibility for the evaluation of the subcategories in the following step.

Some descriptions did not group well with other descriptions. New subcategories were created for some of these unique descriptions, if the descriptions were different enough to warrant separate subcategories. Other unique descriptions were grouped with descriptions that seemed to represent a similar intent. The remaining unique descriptions were placed in a miscellaneous subcategory, along with a few general descriptions that described "new" or "additional" features. If a description referred to more than one type of change, the description was assigned to the subcategory corresponding with the first change mentioned, unless a subsequently described change was more specific.

Procedure for Assigning Levels to the Subcategories

The second research question was (B): What level of evidence is provided by each subcategory of subject and function change in recognizing a new serial work? To answer this question, the subcategories were classified according to the expected value of the changes in identifying a new work. The following steps were performed:

1. Assigned a level to each subject subcategory
   - Developed guidelines for assigning levels to the subject subcategories:
     - High-level: (1) changed overall content of the serial
     - Medium-level: (1) added or deleted certain subjects, (2) changed overall emphasis or focus, (3) increased/decreased emphasis on certain subject(s), or (4) brought title into harmony with the content of the serial
     - Low-level: (1) brought title into harmony with the stated scope of the serial
   - Assigned a level to each subject subcategory, along with a code (e.g., S1.1 for high, S2.1 for medium, S3.1 for low)
   - Entered a code for each description associated with each serial in appendix A (column 3)
2. Assigned a level to each function subcategory
   - Developed guidelines for assigning levels to the function subcategories:
     - High-level: (1) changed overall function of the serial
     - Medium-level: (1) added or deleted certain types of articles, (2) increased/decreased emphasis on certain types of articles, or (3) brought title into harmony with the types of articles published in the serial
     - Low-level: (1) added, deleted, or changed sections or features in the serial
   - Assigned a level to each function subcategory, along with a code (e.g., U1.1 for high, U2.1 for medium, U3.1 for low)
   - Entered a code for each description associated with each serial in appendix A (column 3)
3. Assigned a primary level to each serial
   - Assigned a primary level (high, medium, or low) to each serial, based on the highest level subcategory associated with the serial
   - Recorded a term (high, medium, or low) for the primary level assigned to each serial in appendix A (column 4)

The FRBR guidelines for modified works, requiring a significant degree of change to recognize a new work, provided the basis for assigning the levels to the subcategories. The guidelines, developed by an IFLA Study Group on the Functional Requirements for Bibliographic Records, state: "By contrast, when the modification of a *work* involves a significant degree of independent intellectual or artistic effort, the result is viewed, for the purpose of this study, as a new *work*."[29] Though the guidelines were not intended specifically for serials, the idea that significant effort or change must occur to recognize a new work was assumed to apply to any resource that has undergone change.

The task was to determine the kinds of subject and function changes that would be significant versus those that

would not be significant. Five levels were used initially, but this proved to be too specific, so three three levels noted above were then used, which seemed sufficient to distinguish the subcategories. It was envisioned that the high-level subcategories would represent major changes, the medium-level subcategories would represent moderate changes, and the low-level subcategories would represent minor changes.

Procedure for Recognizing New Works

The third research question was (C): Which of the subcategories, or combinations of subcategories, of subject and function change provide evidence of a significant change, needed to recognize a new serial work? To answer this question, three approaches were developed, using the sampled serials to test each approach. The primary approach consisted of identifying serials with high-level subject or function changes. If a high-level change did not occur, two alternate approaches were tried, involving the identification of serials with medium-level subject or function changes. The steps taken with each approach are described below.

1. Primary approach: Identified high-level subject and function changes
   - Identified all serials in appendix A (column 4) for which a high-level subject or function change occurred
   - Determined the total number of serials for which a high-level change occurred
2. Alternate approach (1): Identified multiple medium-level subject or function changes
   - Identified all serials in appendix A (column 3) that had multiple medium-level subject or function changes and no high-level change
   - Developed tests to determine which serials with multiple medium-level changes were potentially new works
3. Alternate approach (2): Identified successive medium-level subject or function changes
   - Identified all serials in appendix A that had a succeeding title change
   - Identified the serial sets that met the following conditions: (1) neither of the serials in the set had a high-level, and (2) each serial in the set had a single medium-level change
   - Developed tests to determine which serials with successive title changes were potentially new works

It was assumed that the identification of high-level changes, in the primary approach above, would provide sufficient evidence for a new work, with no further testing required. However, for the alternate approaches, which used medium-level changes as evidence, a means was needed to determine whether the combined changes could be considered significant. Two tests were developed to evaluate these changes. The first test required three medium-level subject or function changes to occur, in any combination. The second test required two prioritized medium-level subject or function changes to occur. A list was created of medium-level subcategories representing prioritized changes, including four subject subcategories and four function subcategories. An attempt was made in creating the list to identify the subcategories that represented the greatest amount of change. The list was intended as a preliminary list, with modifications anticipated as the procedure was implemented and evaluated. The subcategories were the following:

S2.2—Broadened content to include other subjects
S2.5—Changed overall emphasis or focus
S2.7—Narrowed content
S2.9—Brought title into harmony with content of serial
U2.9—Increased emphasis on original, scientific, or conceptual articles
U2.10—Increased emphasis on the peer review process
U2.11—Narrowed the article selection policy
U2.13—Brought title into harmony with types of articles published

Results

The findings from the study are reported here, relevant to the three tasks that were performed: (A) identifying subcategories, (B) assigning levels to the subcategories, and (C) developing procedures for recognizing new serial works.

Identifying Subcategories

The 179 descriptions of subject and function changes associated with the ninety-seven serials in the sample were grouped into thirty-five subcategories. The grouping resulted in the creation of thirteen subcategories pertaining to subject changes and twenty-two subcategories relating to function changes. The subject subcategories are listed in appendix B, along with descriptions of the associated subject changes, and the function subcategories and descriptions are listed in appendix C. There were eighty descriptions of subject changes in the sample and ninety-nine descriptions of function changes.

Assigning Levels to the Subcategories

Each subject and function subcategory identified above was assigned to one of three levels: high, medium, or low.

Table 1 lists the subject subcategories assigned to each of the three levels, with table 2 listing the function subcategories assigned to each level. The eighty descriptions of subject changes were assigned as follows: twenty-one descriptions were assigned to a high-level subcategory, fifty-four to a medium-level subcategory, and five to a low-level subcategory. The ninety-nine descriptions of function changes were assigned as follows: seventeen descriptions were assigned to a high-level subcategory, forty-five to a medium-level subcategory, and thirty-seven to a low-level subcategory.

A primary level was assigned to each serial, based on the highest level subject or function subcategory associated with the serial. Over a third of the serials (36.1 percent) were classed with a primary level for a high-level change, over half (57.7 percent) with a primary level designating a medium-level change, and less than a tenth (6.2 percent) with a primary level for a low-level change.

Table 1. Subject Change Subcategories by Level of Evidence

Code	Subcategories by Level of Evidence	No. of Descriptions
	HIGH	
S1.1	Changed overall subject content	5
S1.2	Broadened content to a more inclusive field(s) of study	7
S1.3	Broadened geographic coverage	9
	Subtotal	21
	MEDIUM	
S2.1	Added a subject(s)	9
S2.2	Broadened content to include other subjects	8
S2.3	Broadened content with more varied coverage	7
S2.4	Changed content to reflect developments in the field	9
S2.5	Changed overall emphasis or focus	4
S2.6	Increased emphasis on a subject(s)	9
S2.7	Narrowed content	1
S2.8	Stopped covering a subject(s)	2
S2.9	Brought title into harmony with content of serial	5
	Subtotal	54
	LOW	
S3.1	Brought title into harmony with stated scope of serial	5
	Subtotal	5

Developing Procedures for Recognizing New Serial Works

The findings from the foregoing tasks were used to develop procedures for recognizing new serial works. Three approaches were developed, including a primary approach and two alternate approaches. The serials in the sample were used to test each approach, with the results from the testing described below.

The primary approach for recognizing a new serial work consisted of identifying a high-level subject or function change in the serial. Tables 1 and 2 contain respective displays of the high-level subcategories of subject and function changes found in the study. The descriptions associated with each subcategory are listed in the appendixes, with appendix B providing descriptions of the high-level subject changes and appendix C providing descriptions of the high-level function changes. The ninety-seven serials in the sample had thirty-five changes falling into a high-level subject or function subcategory, not counting three duplicate changes. Two serials (no. 85 and no. 95) had subject changes falling into two different subcategories. Also, one serial (no. 1) had both a high-level subject change and a high-level function change. When excluding the duplicate subject changes, about half of the high-level changes (nineteen) were subject changes, and the other half (seventeen) were function changes. Close to a third (29.2 percent) of the 120 serials in the original sample, from which the current sample was taken, were identified as new works using the foregoing approach.

The first alternate approach that was tried for identifying new works considered the evidence provided by multiple medium-level changes in the serials. Only those serials were examined that were not already identified with a high-level change. Of the sixty-two serials not identified with a high-level change, seventeen had multiple medium-level changes. A total of forty-four medium-level changes occurred in the seventeen serials, including nineteen function changes and twenty-five subject changes. For close to two-thirds of the serials (eleven), two medium-level changes occurred, and for close to one-fourth of the serials (four), three medium-level changes occurred. The remaining two serials had four or six medium-level changes each.

To evaluate this approach, two tests were developed to set limits on the combination of medium-level changes that would qualify a serial as a new work. The results from applying Test 1, requiring three medium-level subject or function changes to occur, are found in table 3. This test resulted in six of the seventeen serials qualifying as new works. The results from applying Test 2, requiring

two prioritized medium-level subject or function changes to occur, are reported in table 4. This test resulted in three of the seventeen serials qualifying as new works. More new works were thus identified with the first test. The new works identified with each test were different, except for one serial (no. 112) which qualified under both tests.

The second alternate approach used to identify new works considered the evidence provided by cumulative change in serials that had a succeeding title change. The sample included nine sets of serials with a succeeding title change, with each set consisting of two title changes. The goal was to identify any set for which new works had not already been identified with the previous approaches. The sets are listed in table 5. Two sets were eliminated due to a high-level change occurring in one or both of the serials in the set. Three additional sets were eliminated because at least one of the serials had multiple medium-level changes. In the one remaining set (set 6), there was a single medium-level change in each of the serials comprising the set.

To evaluate this approach for its value in identifying new works, Test 2, above, requiring two prioritized changes to occur, was used. Test 1, requiring three medium-level changes to occur, could not be used since only two changes occurred in the set. When applying Test 2, both of the changes that occurred qualified as prioritized changes, as follows:

> S2.2—Broadened the scope of the Federation and the Journal to cover all waste control problems, including more space given to industrial waste papers in relation to papers on municipal sewage works problems (no. 114)
> S2.2—Broadened responsibility of the Federation and the Journal to cover water pollution control (no. 113)

Table 2. Function Change Subcategories by Level of Evidence

Code	Subcategories by Level of Evidence	No. of Descriptions
	HIGH	
U1.1	Changed overall function of serial	17
	Subtotal	17
	MEDIUM	
U2.1	Began including authoritative articles on special topics	2
U2.2	Began including commentaries	3
U2.3	Began including conference or symposia papers or plans	3
U2.4	Began including literature reviews or review articles	9
U2.5	Began including non-conference articles	2
U2.6	Began including reports	2
U2.7	Began publishing original, scholarly, or research articles	9
U2.8	Developed or expanded upon a function	4
U2.9	Increased emphasis on original, scientific, or conceptual articles	3
U2.10	Increased emphasis on the peer review process	4
U2.11	Narrowed the article selection policy	1
U2.12	Stopped including a function	1
U2.13	Brought title into harmony with types of articles published	2
	Subtotal	45
	LOW	
U3.1	Added a bibliography section	2
U3.2	Added a book review section	2
U3.3	Added a commentary, discussion, or debate section	7
U3.4	Added a correspondence section	4
U3.5	Added a news section	3
U3.6	Added a notes section	4
U3.7	Added abstracts, resumes, or other new features	5
U3.8	Changed or updated a section or feature	10
	Subtotal	37

Summary of Results

A summary of the results when applying the three approaches to recognize new works is provided in table 6. The primary approach, using only high-level subject or function changes to recognize a new work, resulted in thirty-five new works being identified in the ninety-seven serials examined. When also using the two alternate approaches, the number of new works potentially identified increased. The first alternate approach, requiring multiple medium-level changes to occur, resulted in either three or six additional new works being identified, depending on which limiting procedure was used. The second alternate approach, requiring cumulative medium-level changes to occur over a range of title changes, resulted in one additional new work being identified. When using all three approaches, a maximum of forty-two of the ninety-seven serials were potentially identified as new works. When considering the original sample of 120 serials, the percent of serials potentially identified as new works

Table 3. Medium-Level Changes: Minimum of Three

Sample No.	Codes	Descriptions of Change
18	U2.1	Began publishing an authoritative article each month on a problem confronting the Institute
	U2.2	Began publishing opinion translations on issues between East and West
	U2.3	Began including presentations of conference problems and plans
	U2.8	Began including more comprehensive and valuable materials, but still within the realm of a news bulletin
25	S2.6	Increased emphasis on American archaeology
	U2.6	Began publishing various reports, including annual reports, of the Institute and the School at Athens
	U2.9	Began publishing more scientific papers
39	S2.4	Changed content to resonate with the far-reaching transformations taking place in the Americas
	S2.5	Began promoting a reexamination of prevailing social science theory and concepts about Latin America and the Caribbean
	S2.6	Increased emphasis on interdisciplinary studies, including comparative, cross-regional perspectives
59	S2.1	Began covering the cognate sciences
	S2.4	Broadened content to match the enlarged scope that the term Folklore has reached and the enlarged [non-folklorist] readership that is anticipated
	U2.6	Began including special reports on recent research in the cognate sciences [as related to folklore]
103	S2.4	Changed focus to reflect today's occupational and environmental health problems
	S2.6	Increased emphasis on environmental medicine
	U2.8	Expanded the educational function of the journal to include articles on issues of current importance, as well as methodological papers
112	S2.2	Expanded coverage to include research on hazardous wastes, groundwater contamination, waste minimization, and environmental risk and health
	U2.4	Added an annual literature review issue
	U2.4	Began including State-of-the-art reviews of scientific and technological issues
	U2.7	Began including four types of papers: (1) RESEARCH PAPERS, (2) RESEARCH NOTES, (3) DISCUSSIONS, and (4) DISCUSSION CLOSURES
	U2.10	Began enhancing the rigor of the manuscript review process
	U2.10	Placed manuscript acceptance decisions under the control of a Board of Editorial Review, to enhance the stature of the Journal in all water quality areas

Table 4. Medium-Level Changes (Prioritized): Minimum of Two

Sample No.	Codes	Descriptions of Change (Prioritized)
52	S2.2	Broadened content to include art education (providing information, presenting theories and criticisms, announcing opportunities and resources, and promoting discussion relating to art education)
	S2.2	Broadened discussion beyond problems concerning the history of art [a major purpose of journal is discussion]
66	U2.9	Increased preference for original contributions on treatment and research in all branches of the theory and practice of the conservation of cultural property, as well as contributions in art history and science
	U2.10	Increased emphasis on the peer review process by excluding preprint volumes as published volumes of the journal
112	S2.2	Expanded coverage to include research on hazardous wastes, groundwater contamination, waste minimization, and environmental risk and health
	U2.10	Began enhancing the rigor of the manuscript review process
	U2.10	Placed manuscript acceptance decisions under the control of a Board of Editorial Review, to enhance the stature of the Journal in all water quality areas

using the primary approach was 29.2 percent (35/120), and when also using the two alternate approaches the percent increased to a maximum of 35.0 percent (42/120).

Discussion of Findings

This study was different from previous studies of serials with title changes in that the focus was on subject and function changes, rather than on the full array of changes that might occur when a title changes. Thus no comparison of findings can be made with previous studies. The limitations of the study are discussed below, including comments about potential bias and to what extent the findings can be generalized. Issues involved in using the findings to recognize new serial works are also discussed.

There was potential bias in the way the descriptions were grouped into subcategories, despite relying on common word usage in the grouping, since some descriptions could not be readily grouped based on word usage. By expanding the number of subcategories, the problem was lessened, with fewer descriptions requiring special handling. There was also potential bias in assigning levels to the subcategories. For example, the subcategory "Broadened geographic coverage" might have been classed as a medium-level change rather than a high-level change. Likewise, some subcategories assigned as medium-level subcategories could possibly have been classed as high-level subcategories, for example: "Narrowed content," "Narrowed the article selection policy," and "Increased emphasis on original, scientific, or conceptual articles." The assignment of levels to the subcategories was preliminary and not a final determination of how the various subcategories should be treated.

The findings from the study can be generalized to academic serials, from which the sample was drawn. The findings should also have relevance to other types of serials, though the thirty-five subcategories identified in the study may not be as comprehensive as needed to categorize the full range of changes that might occur in a collection of both academic and nonacademic serials. A study of nonacademic serials is needed to determine whether additional subcategories would be needed for these serials.

Various approaches might have been taken in developing the procedures for recognizing new works. The three approaches chosen seemed logical in light of the data available and the need to be practical. The primary approach, requiring the occurrence of a high-level change in the serial, was the preferred approach. Whether one would also use alternate approaches would depend on how broadly or narrowly the concept of significant change is interpreted. With a narrow interpretation, only the primary approach would be appropriate. With a broader interpretation, the alternate approaches might also be used. These decisions would have to be made by the serials community. The pros and cons of each approach are discussed below.

Table 5. Successive Medium-Level Changes

Set No.	Sample No.	Subcategory Codes	Primary Level of Evidence
1	34	U1.2 U3.8	high
	33	U1.2	high
2	40	S1.3	high
	39	S2.4 S2.5 S2.6 U3.2 U3.3 U3.3 U3.6	medium
3	64	S2.6 S3.1	medium
	63	S2.6 S2.9	medium
4	71	S2.3 S2.6	medium
	70	S2.5	medium
5	97	U1.2	high
	96	S2.1 S3.1 U3.8	medium
6	114	S2.2	medium
	113	S2.2	medium
7	113	S2.2	medium
	112	S2.2 U2.4 U2.4 U2.7 U2.10 U2.10	medium
8	118	U1.2	high
	117	U1.2	high
9	117	U1.2	high
	116	S3.1 U3.7	low

Table 6. Approaches for Identifying New Serial Works

Approach	Changes Required by the Approach	New Works Identified (*N* = 120)*	Percent
Primary approach	One high-level change	35	29.2
Alternate approach (1a)	Three medium-level changes	6 (a)	5.0 (a)
Alternate approach (1b)	Two medium-level changes (prioritized)	3 (b)	2.5 (b)
Alternate approach (2)	Two medium-level changes (succeeding, prioritized)	1	0.8
Total		42 (a) 39 (b)	35.0 (a) 32.5 (b)

* "N" represents the number of serials in the original sample from which the current sample was taken.

The primary approach required a high-level subject or function change to occur. Pros and cons of this approach include the following:

- Pros: This would be the most reliable approach for identifying new serial works, since only a major change would qualify a serial as a new work. It is also expected to be the easiest to apply, since one would look for only a few types of changes in the serial, falling within the four high-level subject or function subcategories.
- Cons: The effectiveness of this approach would depend on how accurately the high-level subcategories have been identified.

The first alternate approach required multiple medium-level subject or function changes to occur. Some pros and cons of this approach would be the following:

- Pros: This approach would provide a way to potentially identify more new works than if just the primary approach were used.
- Cons: This approach may yield incorrect results, since a combination of moderate changes may not be sufficient to determine that a significant change has occurred. The limiting procedures may incorrectly determine that substantial change has occurred. The time required to look for the many kinds of medium-level changes in the serials and then apply the limiting procedures would also have to be considered.

The second alternate approach required successive medium-level subject or function changes to occur. Some pros and cons of this approach would be the following:

- Pros: This approach would provide a way to potentially identify more new works than if just the primary approach and the first alternate approach were used. A possible advantage of this approach over the previous alternate approach would be that more change may occur over a span of title changes than one might find in a single title change. In the one example found in the sample, there seemed to be a progression of change from one title change to the next.
- Cons: This approach may yield incorrect results, since the combination of changes may not be sufficient to be considered significant. The limiting procedures may, as above, incorrectly determine that substantial change has occurred. One would also have to consider whether a new work should be identified over a range of title changes, as well as the need to keep track of changes occurring over multiple title changes. Since only one potential new work was identified in the sample, this approach may not be worth considering, though in a larger sample more new works might have been recognized.

In summary, each of the three approaches for identifying new works has advantages and disadvantages. The primary approach, requiring high-level changes to occur, would be the most straightforward to apply and would yield the best results. The two alternate approaches, using medium-level changes, would require time to look for the various kinds of changes in the serials and then to apply the limiting procedures. This may not be practical in a cataloging environment. One would also have to consider how strictly to interpret the concept of significant change in serials and whether the goal should be to limit the number of new works identified or to expand the number. These issues will require discussion by the serials community.

Recommendations

The purpose of the study was to develop a means for identifying significant subject and function changes in serials with title changes and then to recommend changes in cataloging rules for recognizing new serial works. A previous study recommended that a new work should be recognized only when a significant subject or function change has occurred. The current study enlarges upon this by providing a way to determine when a significant change has occurred.

Since the study showed that high-level subject and function changes provide the best evidence for significant change in serials with title changes, it is recommended that the four high-level subject and function changes identified in the study be used to recognize new works. Whether multiple medium-level changes should also be treated as significant was not conclusively determined in the study. It is recommended that the serials community evaluate the study's findings concerning both the high-level changes and the medium-level changes to determine whether broadening or narrowing of the assigned levels should be made and whether multiple medium-level changes should be considered as evidence for a significant change. Pending these discussions, a narrow interpretation of significant change is assumed in the recommendations that follow.

The recommendations that follow are specific to cataloging rules based on FRBR concepts, in particular the RDA rules, since the study used FRBR guidelines in the development of the procedures. The recommendations will have most relevance to academic serials, due to limitations in the sample, but the recommendations are broad enough to also have potential application to nonacademic serials. The recommendations are, moreover, specific to serials with title changes and do not cover serials with other types of changes,

such as a change in responsibility.

Given the above limitations, it is recommended that the RDA rules for creating new access points for serials with title changes be modified to incorporate the changes described below. In particular, the following rules should be changed: RDA rule 6.1.3.2.2, titled "Major change in the title proper," along with RDA rule 2.3.2.13, titled "Major and minor changes in the title proper of serials."[30] The elements that should be incorporated include the following:

1. Determine the reason for the title change by using one of the following sources of information, in the following order:
   - An explanation provided in the first issue of the serial with the new title (or a subsequent issue, if needed)
   - An explanation provided by the publisher, editor, or sponsoring agency of the serial
   - An explanation from another external source explaining why the title changed
   - Words in the title
2. Create a new access point for a work when the reason for the title change meets one of the following conditions:
   - There has been a significant change in the subject content of the serial, as evidenced by a change in one of the following subcategories: (1) changed overall subject content, (2) broadened content to a more inclusive field(s) of study, or (3) broadened geographic coverage (see appendix B for examples).
   - There has been a significant change in the function of the serial, as evidenced by a change in the following subcategory: (1) changed overall function of serial (see appendix C for examples).

Conclusion and Further Research

The object of the study was to propose RDA cataloging rule changes for serials with title changes. Preliminary recommendations are made, pending additional research and testing. Some of the areas in which additional study is needed are described here.

The primary area in which additional research should be undertaken is with regard to title changes in nonacademic serials. It would be useful to collect information paralleling what was found for academic serials, including the identification of the subcategories of subject and function changes that occur in nonacademic serials with title changes. These findings could be used to broaden the recommendations in the current study to apply to both academic and nonacademic serials.

There is a further need to seek input from the serials community on the recommended rule changes, especially concerning the dividing point between a medium-level change and a high-level change. The community should also consider whether multiple medium-level changes would provide sufficient evidence for identifying a new work or if only high-level changes should be considered.

The proposed rule changes should be tested in a cataloging environment. Testing would help to determine whether the rule changes are practical for a working environment and where clarification is needed. There is also a need to determine the practicality of seeking input from publishers, editors, and sponsoring agencies when the reason for a title change is not found in the serial itself. It would be helpful to know the amount of time required to contact publishers and others, as well as the success rate in obtaining the needed information.

The recommendations made in the study provide a strong foundation for improving the RDA cataloging rules. The additional research and testing proposed here could be used to refine the recommendations further and ensure that the suggested changes will work well in today's cataloging environment.

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26. *RDA*, glossary.
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29. Ibid., 18.
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Appendix A. Sample of Serials with Title Changes*

Sample No.	New Title**	Subject & Function Subcategory Codes†	Primary Level of Evidence
	JSTOR Arts and Sciences I Collection		
1	(3) African American review (1992–2004)	S1.2 U1.2	high
2	(2) American journal of political science (1973–2006)	S1.3	high
6	(2) Current anthropology (1959–1999)	U1.2	high
7	(4) International perspectives on sexual and reproductive health (2009)	S2.2	medium
8	(2) International family planning perspectives and digest (1978)	U2.7	medium
9	(2) The journal of American history (1964–2002)	S1.3	high
10	(2) Journal of economic literature (1969–2005)	U2.7	medium
11	(2) Journal of health and social behavior (1967–2005)	S1.1	high
13	(4) Journal of the Royal Statistical Society. Series A (Statistics in society) (1988–2003)	S2.5	medium
14	(2) Journal of the Royal Statistical Society. Series D (The statistician) (1962–2003)	U1.2	high
15	(2) Mathematics of computation (1960–2002)	S2.1	medium
16	(2) MLN (1962–2002)	S2.8	medium
17	(3) Nineteenth-century literature (1986–2004)	S1.2	high

Appendix A. Sample of Serials with Title Changes (cont.)*

Sample No.	New Title**	Subject & Function Subcategory Codes†	Primary Level of Evidence
18	(2) Pacific affairs (1928–2002)	U2.1 U2.2 U2.3 U2.8	medium
19	(2) Perspectives on sexual and reproductive health (2002–2006)	S2.1 S2.6	medium
20	(2) Population (English edition) (2002–2005)	U1.1	high
22	(2) Social psychology (1978)	S1.1	high
	JSTOR Arts and Sciences II Collection		
23	(2) African affairs (1944–1999)	U2.13	medium
24	(2) African studies review (1970–2004)	U2.7	medium
25	(2) American journal of archaeology (1897–2002)	S2.6 U2.6 U2.9	medium
26	(2) Biometrics (1947–2002)	U1.2	high
27	(2) British journal of Middle Eastern studies (1991–2004)	U1.2	high
28	(2) Canadian journal of African studies (1967–2004)	U1.2 U2.7	high
29	(2) The Canadian journal of economics and political science (1935–1967)	S2.1	medium
30	(2) Europe-Asia studies (1993–2004)	S1.3	high
31	(4) Geographical review (1916–2002)	S2.3 U2.7	medium
32	(2) History of education quarterly (1961–2002)	U2.8	medium
33	(5) International affairs (Royal Institute of International Affairs) (1944–2002)	U1.2	high
34	(4) International affairs review supplement (1940–1943)	U1.2 U3.8	high
35	(2) International migration review (1966–2002)	U2.7	medium
36	(2) Background (1962–1966)	U2.8	medium
37	(3) Journal of marriage and the family (1964–2002)	U2.4 U3.7 U3.8 U3.8	medium
38	(3) Journal of Near Eastern Studies (1942–2002)	S2.4	medium
39	(3) Latin American politics and society (2001–2004)	S2.4 S2.5 S2.6 U3.2 U3.3 U3.3 U3.6	medium
40	(2) Journal of interamerican studies and world affairs (1970–2000)	S1.3	high
41	(2) National mathematics magazine (1934–1945)	U2.13	medium
42	(2) Medical anthropology quarterly (1983–2000)	S2.4 U3.7 U3.7 U3.8	medium
44	(2) Newsletter on science, technology, & human values (1976–1978)	S2.5 U3.1 U3.5	medium
45	(2) Sixteenth century journal (1972–2002)	U2.5	medium
46	(4) Slavic review (1961–2006)	U3.3	low
48	(3) Transactions of the American Philological Association (1974–2000)	U2.12	medium
49	(3) Transactions of the Institute of British Geographers (1965–2002)	U2.4 U3.4	medium
	JSTOR Arts and Sciences III Collection		
51	(2) The bulletin of the College Art Association of America (1917–1918)	U3.7	low
52	(2) College art journal (1941–1960)	S2.2 S2.2 U3.2 U3.5	medium
53	(3) Asian ethnology (2008–2009)	S1.2 S2.9	high
54	(2) The Burlington magazine (1948–2002)	S2.1 S2.9	medium
55	(2) Contemporary literature (1968–2004)	S3.1 U3.4	low
56	(2) Ethnomusicology forum (2004)	S2.3	medium
57	(3) Film quarterly (1958–2004)	S2.4 U3.4 U3.5 U3.6	medium
59	(3) Folklore (1890–2002)	S2.1 S2.4 U2.6 U3.1	medium
61	(2) Journal of African cultural studies (1998–2003)	S2.8	medium
62	(3) Journal of architectural education (1984–1997)	U1.2	high

Appendix A. Sample of Serials with Title Changes (cont.)*

Sample No.	New Title**	Subject & Function Subcategory Codes†	Primary Level of Evidence
63	(3) The Old and New Testament student (1889–1892)	S2.6 S2.9	medium
64	(2) The Old Testament student (1883–1889)	S2.6 S3.1	medium
65	(2) Journal of Bible and religion (1937–1966)	S1.2	high
66	(3) Journal of the American Institute for Conservation (1977–2004)	U2.9 U2.10	medium
68	(2) Journal of the American Musicological Society (1948–2004)	U2.11	medium
69	(2) The journal of the Society of Architectural Historians (1945–2004)	U3.8	low
70	(3) Latin American music review / Revista de Música Latinoamericana (1980–2004)	S2.5	medium
71	(2) Anuario Interamericano de Investigacion Musical (1970–1975)	S2.3 S2.6	medium
72	(2) The musical times (1903–2004)	U3.4 U3.8 U3.8 U3.8	low
73	(2) PAJ: A journal of performance and art (1998–2002)	S2.1 S2.6 U3.6	medium
74	(2) Recent acquisitions (Metropolitan Museum of Art) (1985–1987)	S2.4	medium
75	(3) Rocky Mountain review of language and literature (1975–2006)	S2.9 U1.2	high
76	(2) South central review (1984–2003)	U2.7	medium
77	(2) Theatre journal (1979–1995)	S2.3 S3.1	medium
79	(2) Yearbook of the International Folk Music Council (1969–1980)	U1.2	high
	JSTOR Life Sciences Collection		
80	(2) Arctic, Antarctic, and alpine research (1999–2004)	S1.3 S2.1 S2.6 U2.4	high
82	(2) Clinical infectious diseases (1992–2004)	U1.2 U2.1 U2.2	high
84	(2) Diversity and distributions (1998–2001)	S2.1	medium
85	(2) Ecography (1992–2000)	S1.2 S1.3 S2.4 U3.6	high
86	(2) Epidemiology and infection (1987–2002)	S2.7 U2.4	medium
87	(2) Estuaries (1978–2002)	S1.3 U2.4	high
89	(2) Folia geobotanica (1998–2004)	U2.3 U3.3	medium
90	(2) Global ecology and biogeography (1999–2001)	S1.1 U2.7	high
91	(2) Infection control and hospital epidemiology (1988–2004)	S2.2 U3.3	medium
92	(2) Integrative and comparative biology (2002)	S2.4	medium
93	(3) International journal of plant sciences (1992–2002)	U2.2	medium
94	(4) Invertebrate biology (1995–2002)	S1.1	high
95	(2) Journal of avian biology (1994–2000)	S1.2 S1.3 S2.9 U3.3 U3.3	high
96	(3) Journal of avian medicine and surgery (1995–2006)	S2.1 S3.1 U3.8	medium
97	(2) Journal of the Association of Avian Veterinarians (1989–1994)	U1.2	high
98	(3) Journal of epidemiology and community health (1978)	S2.2 U2.4	medium
101	(2) Journal of the Torrey Botanical Society (1997–2004)	U1.2	high
102	(2) Micropaleontology (1955–2004)	S1.1	high
103	(2) Occupational and environmental medicine (1994–2006)	S2.4 S2.6 U2.8 U3.8	medium
104	(7) Philosophical transactions: biological sciences (1990–2004)	S2.3	medium
106	(6) Proceedings: biological sciences (1990–2004)	S2.3 U2.9	medium
107	(6) Proceedings: mathematical and physical sciences (1990–1995)	S2.3	medium
108	(2) Systematic biology (1992–2004)	S1.2 U2.3 U2.4	high
112	(4) Research journal of the Water Pollution Control Federation (1989–1991)	S2.2 U2.4 U2.4 U2.7 U2.10 U2.10	medium

Appendix A. Sample of Serials with Title Changes (cont.)*

Sample No.	New Title**	Subject & Function Subcategory Codes†	Primary Level of Evidence
113	(3) Journal (Water Pollution Control Federation) (1960–1989)	S2.2	medium
114	(2) Sewage and industrial wastes (1950–1959)	S2.2	medium
115	(2) Colonial waterbirds (1981–1998)	S1.3 U2.5 U2.10	high
116	(6) The Wilson journal of ornithology (2006)	S3.1 U3.7	low
117	(5) The Wilson bulletin (1894–2004)	U1.2	high
118	(4) The journal of the Wilson Ornithological Chapter of the Agassiz Association (1893)	U1.2	high

* Sample is from "JSTOR Currently Available Journals," July 19, 2010.
** Number preceding title shows order of title change, for example "(3)" means this is the third title in the title change history.
† S1 & U1 = high-level changes; S2 & U2 = medium-level changes; S3 & U3 = low-level changes.

Appendix B. Descriptions of Subject Changes in Sampled Serials

Sample No.	Descriptions of Change by Subcategory*
	ADDED A SUBJECT(S) = S2.1
80	S - Began covering Antarctic, along with Arctic and alpine research
73	S - Began covering commentary on art world activities as they articulate key issues in performance and spectatorship [a major purpose of journal is commentary]
84	S - Began covering geographical range
54	S - Began covering modern art, while continuing to focus on objective analyses of past events
15	S - Began covering numerical analysis and computation
29	S - Began covering political science
19	S - Began covering sexual and reproductive health
59	S - Began covering the cognate sciences
96	S - Began including articles on free-ranging and domestic birds
	BROADENED CONTENT TO A MORE INCLUSIVE FIELD(S) OF STUDY = S1.2
85	S - Began concentrating on all types of descriptive and/or analytical studies in ecology
17	S - Broadened content from fiction to all genres of literature, along with coverage of ideas and movements in 19th century literature, and literary criticism
1	S - Broadened content from literature to culture
108	S - Broadened content from systematic zoology to systematic biology
95	S - Broadened content to all fields of avian science, within the frame of basic science
53	S - Broadened subject coverage from folklore to ethnology, to attract other scholars
65	S - Broadened the scope of the journal to include the interests of both professionals and non-professionals in the Biblical field
	BROADENED CONTENT TO INCLUDE OTHER SUBJECTS = S2.2
52	S - Broadened content to include art education (providing information, presenting theories and criticisms, announcing opportunities and resources, and promoting discussion relating to art education)
52	S - Broadened discussion beyond problems concerning the history of art [a major purpose of journal is discussion]
113	S - Broadened responsibility of the Federation and the Journal to cover water pollution control
7	S - Broadened subject coverage to include topics such as HIC, sex behavior, and reproductive health consequences
114	S - Broadened the scope of the Federation and the Journal to cover all waste control problems, including more space given to industrial waste papers in relation to papers on municipal sewage works problems

Appendix B. Descriptions of Subject Changes in Sampled Serials (cont.)

Sample No.	Descriptions of Change by Subcategory*
98	S - Broadened the scope to include epidemiology and community health
112	S - Expanded coverage to include research on hazardous wastes, groundwater contamination, waste minimization, and environmental risk and health
91	S - Expanded scope to include hospital epidemiology
	BROADENED CONTENT WITH MORE VARIED COVERAGE = S2.3
77	S - Broadened content
104,106,107	S - Broadened content by publishing more papers of a shorter length
31	S - Broadened content to a wider range of articles
71	S - Broadened content with more varied coverage
56	S - Expanded type of style and content that will be accepted
	BROADENED GEOGRAPHIC COVERAGE = S1.3
85	S - Broadened content by eliminating biogeographical delimitations
2	S - Broadened content from regional [Midwest] to national [American] aspects of political science
9	S - Broadened content from regional [Mississippi Valley] to national [American] history
95	S - Broadened content from regional [Scandinavica] to international
115	S - Broadened content to include colonial waterbirds anywhere in the world
80	S - Broadened content to reflect the global connections being made in the field of earth surface processes
40	S - Broadened content to the world at large, but with the main emphasis still on the Americas
30	S - Broadened content to wider geographical limits and coverage of issues, though focus remains on the former Soviet block countries
87	S - Changed content from the natural resources of the Chesapeake Bay watershed to any aspect of natural science applied to estuaries, with no geographical limits
	BROUGHT TITLE INTO HARMONY WITH CONTENT OF SERIAL = S2.9
53	S - Began reflecting the research and scholarship the journal has long embodied
54	S - Brought the title into harmony with the contents of the magazine [by deleting the word *connoisseurs*]
63, 75, 95	S - Brought the title into harmony with the journal content
	BROUGHT TITLE INTO HARMONY WITH STATED SCOPE OF SERIAL = S3.1
116	S - Began reflecting more clearly the journal's theme and content
96	S - Began to more adequately reflect the scope and mission of the journal
64	S - Brought the title into harmony with the aim and contents of the journal
77	S - Brought the title into harmony with the editorial purview of the journal
55	S - Brought the title into harmony with the scope of the journal
	CHANGED CONTENT TO REFLECT DEVELOPMENTS IN THE FIELD = S2.4
59	S - Broadened content to match the enlarged scope that the term Folklore has reached and the enlarged [non-folklorist] readership that is anticipated
92	S - Broadened content to reflect a broader integrative view of organismal biology
38	S - Broadened content to the expanding background needed for Biblical studies, and Near Eastern studies in general
42	S - Changed content and emphasis, as the field has matured
85	S - Changed content to be more in line with the international scientific development in ecology [per requirement of the Nordic Publishing Boards in Science]
57	S - Changed content to movies and TV, as a result of the change that has occurred in Hollywood
39	S - Changed content to resonate with the far-reaching transformations taking place in the Americas
74	S - Changed emphasis from notable acquisitions to recent acquisitions, due to changes in costs of art and in available funding

Appendix B. Descriptions of Subject Changes in Sampled Serials (cont.)

Sample No.	Descriptions of Change by Subcategory*
103	S - Changed focus to reflect today's occupational and environmental health problems
	CHANGED OVERALL EMPHASIS OR FOCUS = S2.5
39	S - Began promoting a reexamination of prevailing social science theory and concepts about Latin America and the Caribbean
13	S - Changed emphasis to applications of statistical thinking to social problems
44	S - Changed emphasis to the ethical dimensions of science and technology
70	S - Changed focus to include all of Latin America's oral and written musical traditions
	CHANGED OVERALL SUBJECT CONTENT = S1.1
90	S - Began evolving the content of the journal toward macroecology
22	S - Changed content from sociometry to social psychology
94	S - Changed content to focus explicitly on invertebrate biology
11	S - Changed content to sociology
102	S - Changed content to the whole field of micropaleontology, emphasizing stratigraphic and applied micropaleontology rather than systematics
	INCREASED EMPHASIS ON A SUBJECT(S) = S2.6
80	S - Began covering more fully the work of marine scientists
25	S - Increased emphasis on American archaeology
71	S - Increased emphasis on developments in the *Technocratic Era* [management by technical experts]
103	S - Increased emphasis on environmental medicine
19	S - Increased emphasis on individuals and their rights and responsibilities
39	S - Increased emphasis on interdisciplinary studies, including comparative, cross-regional perspectives
63	S - Increased emphasis on New Testament studies
64	S - Increased emphasis on Old Testament topics, along with previous emphasis on topics of interest to students of the Hebrew language
73	S - Increased emphasis on the history of performance, taking into account the achievements of both theatre and art
	NARROWED CONTENT = S2.7
86	S - Narrowed content from the science of health to the microbiological diseases of man and animals
	STOPPED COVERING A SUBJECT(S) = S2.8
61	S - Stopped covering African languages when content is primarily linguistic in character
16	S - Stopped covering English and American subjects, thus limiting coverage to Romance and Germanic languages and literatures

* "S" preceding descriptions stands for "Subject description." Code following subcategory headings is the subcategory code (e.g., S2.1).

Appendix C. Descriptions of Function Changes in Sampled Serials

Sample No.	Descriptions of Change by Subcategory*
	ADDED A BIBLIOGRAPHY SECTION = U3.1
44	U - Added a General Bibliography section, for publishing annotated listings of recent articles, books and reports
59	U - Began including bibliographic information on books and articles, published at home and abroad
	ADDED A BOOK REVIEW SECTION = U3.2
39	U - Added a Book Review section, for publishing timely reviews of individual books designed to foster critical reflection as opposed to simple description

Appendix C. Descriptions of Function Changes in Sampled Serials (cont.)

Sample No.	Descriptions of Change by Subcategory*
52	U - Began including book reviews for undergraduate teaching
	ADDED A COMMENTARY, DISCUSSION, OR DEBATE SECTION = U3.3
39	U - Added a Critical Debates section, for publishing provocative review essays surveying major themes in the recent social science literature on the region
46	U - Added a Discussion section, to include commissioned review articles on Soviet scholarship
95	U - Added a Forum section, for responses to the Point-of-View papers as well as papers on any general issue in avian biology
95	U - Added a Point-of-View section, in which eminent ornithologists are invited to outline their views of the present status of some general themes in avian biology, as well as speculating on future developments
39	U - Added a Policy Issues section, for publishing contributions on contending perspectives on major issues of significant policy relevance
89	U - Added discussion forums on specialized topics
91	U - Began including columns on issues and topics related to hospital epidemiology
	ADDED A CORRESPONDENCE SECTION = U3.4
72	U - Added a Answers to Correspondents section
57	U - Added a Correspondence and Controversy column, for expressing views on the articles and events
49	U - Began including correspondence, reports of discussions and symposia, and shorter notes
55	U - Began including letters and rejoinders
	ADDED A NEWS SECTION = U3.5
44	U - Added a News Items section, for publishing a) brief summaries of actions by government agencies, professional organizations and the like, b) reports of teaching programs and research in progress, and c) timely announcements of conferences and fellowship opportunities
57	U - Began including information from readers on current experimental activities
52	U - Began including reports relating to courses and programs, exhibitions, and research projects
	ADDED A NOTES SECTION = U3.6
73	U - Added a Art and Performance Notes section
57	U - Added a Film Quartered department, featuring regular competitions
39	U - Added a Research Notes section, for publishing shorter pieces dealing with questions of data, theory, and method
85	U - Added a special section for comments and short scientific notes
	ADDED ABSTRACTS, RESUMES, OR OTHER NEW FEATURES = U3.7
116	U - Added a new feature "Once upon a time" to put forward the observations and reflections of naturalists from times past
37	U - Began including an abstract at the beginning of each published article
42	U - Began including new features and departments, intended to expand news coverage, increase dialogue and debate, and generate discussion
42	U - Began including several additional features, resulting from a series of proposed new directions
51	U - Began printing resumes of the Conference proceedings not elsewhere printed, along with references to where the remaining papers are to be published
	BEGAN INCLUDING AUTHORITATIVE ARTICLES ON SPECIAL TOPICS = U2.1
82	U - Began including a State-of-the-Art Clinical Article by an outstanding authority in each issue
18	U - Began publishing an authoritative article each month on a problem confronting the Institute
	BEGAN INCLUDING COMMENTARIES = U2.2
82	U - Began including an AIDS Commentary in each issue
93	U - Began publishing commentaries on articles, and invited contributions on topics of interest
18	U - Began publishing opinion translations on issues between East and West
	BEGAN INCLUDING CONFERENCE OR SYMPOSIA PAPERS OR PLANS = U2.3
18	U - Began including presentations of conference problems and plans

Appendix C. Descriptions of Function Changes in Sampled Serials (cont.)

Sample No.	Descriptions of Change by Subcategory*
108	U - Began publishing special symposia
89	U - Began publishing special volumes based on focused symposia in the field
	BEGAN INCLUDING LITERATURE REVIEWS OR REVIEW ARTICLES = U2.4
108	U - Added a series for invited minireview articles on topics important to systematists
112	U - Added an annual literature review issue
98	U - Added occasional reviews to the original work normally published
80	U - Began including quality, unpublished literature reviews
86	U - Began including regular reviews and editorials
49	U - Began including review articles
112	U - Began including State-of-the-art reviews of scientific and technological issues
37	U - Began publishing article-length book reviews, and critical and evaluative papers
87	U - Began publishing interpretive review papers that lead to new and important generalizations
	BEGAN INCLUDING NON-CONFERENCE ARTICLES = U2.5
45	U - Began including articles not read at the annual meetings of the Sixteenth Century Studies Conference
115	U - Began including submitted papers not given at a CWG meeting [conference]
	BEGAN INCLUDING REPORTS = U2.6
59	U - Began including special reports on recent research in the cognate sciences [as related to folklore]
25	U - Began publishing various reports, including annual reports, of the Institute and the School at Athens
	BEGAN PUBLISHING ORIGINAL, SCHOLARLY, OR RESEARCH ARTICLES = U2.7
112	U - Began including four types of papers: 1) RESEARCH PAPERS, 2) RESEARCH NOTES, 3) DISCUSSIONS, and 4) DISCUSSION CLOSURES
76	U - Began including scholarly articles, essays, notes, and book reviews
31	U - Began publishing articles with a deeper intellectual interest, and notes and reviews that are more critical and scholarly
35	U - Began publishing contributions offering a more original effort of analysis and clarification of issues
8	U - Began publishing original articles
10	U - Began publishing original articles, book reviews, and bibliographical listings
90	U - Began publishing research articles and research review papers
28	U - Began publishing scholarly articles
24	U - Began publishing substantive research
	BROUGHT TITLE INTO HARMONY WITH TYPES OF ARTICLES PUBLISHED = U2.13
41	U - Clarified nature of the publication by dropping *news letter* for *magazine*, since *news letter* was not descriptive of the content
23	U - Clarified nature of the publication by replacing *journal* for *affairs*, since the research published is not purely scientific
	CHANGED OR UPDATED A SECTION OR FEATURE = U3.8
69	U - Began changing the bibliography, to include only the 20 or so periodicals not covered by the Art Index
72	U - Brought certain features up to date: Occasional Notes, monthly letters, and periodical records of music-makings
96	U - Changed the focus of the editorials to a forum to present controversial and hot issues and trends related to avian medicine
37	U - Enlarged the Book Reviews section
103	U - Expanded the correspondence section to allow debate on published articles, and publication of preliminary findings
34	U - Expanded the Review Section to include reviews and notices of periodical articles and a list of important official documents
72	U - Extended the Church and Organ Music section
72	U - Increased emphasis on biographies, a special feature during the past 5 years

Appendix C. Descriptions of Function Changes in Sampled Serials (cont.)

Sample No.	Descriptions of Change by Subcategory*
42	U - Regularized and expanded the book review section
37	U - Regularized the Letters to the Editor, and the Rejoinders
	CHANGED OVERALL FUNCTION OF SERIAL = U1.1
26	U - Began expanding the function of the publication to a journal, by dropping the word *bulletin* from the title
20	U - Began publishing an English edition [and a simultaneous French edition] containing all articles accepted for publication, instead of the previous delayed selection of articles [in English]
97	U - Began reflecting the establishment of the specialty of avian medicine and surgery [in a medical journal]
6	U - Changed emphasis of the publication to providing the means for individual scholars to communicate with one another, through exchanging and pooling ideas and new knowledge and reviewing past research in relation to current developments
14	U - Changed focus to serve two major functions of the Institute: 1) to provide sound statistical advice to the public, 2) to keep statisticians up to date with new methods
62	U - Changed format to a journal
28, 101	U - Changed function from a bulletin to a journal
75	U - Changed function from a bulletin to a review, to encourage submissions of a broader range of scholarly articles
79	U - Changed function from a journal (publishing conference proceedings and short papers) to a yearbook (publishing extensive in depth studies from original research and surveys of completed or in-progress work)
34	U - Changed function from a journal [suspended due to war] to a supplement [review section of journal]
117	U - Changed function from a journal to a bulletin, containing facts reported by members, due to the expense of producing a journal
1	U - Changed function from a literature forum to a review
27	U - Changed function from a publication with humble beginnings to a scholarly journal
33	U - Changed function from a supplement [review section of journal] back to a journal [restarted following war]
118	U - Changed function to a journal
82	U - Changed to a clinical journal
	DEVELOPED OR EXPANDED UPON A FUNCTION = U2.8
32	U - Began developing a more substantial and truly significant journal
18	U - Began including more comprehensive and valuable materials, but still within the realm of a news bulletin
36	U - Began publishing longer, more interpretive articles [reports on articles from other sources]
103	U - Expanded the educational function of the journal to include articles on issues of current importance, as well as methodological papers
	INCREASED EMPHASIS ON ORIGINAL, SCIENTIFIC, OR CONCEPTUAL ARTICLES - U2.9
106	U - Began encouraging papers leading to conceptual changes in the subject areas
25	U - Began publishing more scientific papers
66	U - Increased preference for original contributions on treatment and research in all branches of the theory and practice of the conservation of cultural property, as well as contributions in art history and science
	INCREASED EMPHASIS ON THE PEER REVIEW PROCESS = U2.10
112	U - Began enhancing the rigor of the manuscript review process
115	U - Changed to a fully refereed journal
66	U - Increased emphasis on the peer review process by excluding preprint volumes as published volumes of the journal
112	U - Placed manuscript acceptance decisions under the control of a Board of Editorial Review, to enhance the stature of the Journal in all water quality areas
	NARROWED THE ARTICLE SELECTION POLICY = U2.11
68	U - Began limiting the papers published from regular meetings, rather than including all papers
	STOPPED INCLUDING A FUNCTION = U2.12
48	U - Stopped publishing the content of the Proceedings with the Transactions

* "U" preceding descriptions stands for "Function description." Code following subcategory headings is the subcategory code (e.g., U3.1).

Notes on Operations

Quality Issues in Vendor-Provided E-Monograph Records

Stacie Traill

As e-book batchloading workloads have increased, the quality of vendor-provided MARC records has emerged as a major concern for libraries. This paper discusses a study of record quality in e-monograph record sets undertaken at the University of Minnesota with the goal of improving and increasing the efficiency of preload editing processes. Through the systematic analysis of eighty-nine record sets from nineteen different providers, librarians identified the most common errors and the likely effect on access. They found that while some error types were very common, specific errors are often unique and complex, making devising a set of broadly applicable strategies to correct them difficult. Based on these results, the author identifies future challenges for maintaining quality in batchloaded record sets and suggests several possible directions for improving record quality.

As libraries expand their electronic collections, many find that the most effective and practical means of providing catalog access to these collections is through batchloading MARC records provided by vendors or publishers into local catalogs. As batchloading becomes more common and libraries share their experiences, certain themes and focuses of discussion have emerged. One is the challenge of incorporating batchloading into existing technical services and systems workflows. Another is navigating the mechanics of record editing and loading processes. A third strand running throughout the batchloading literature is the issue of record quality. General discussions of the topic usually include a least a brief discussion of concerns about record quality, and most case studies of batchloading projects identify multiple quality issues found and addressed as part of the project.

At the University of Minnesota Libraries (UML), experiences have been much the same as those at other institutions. Librarians learned how to manipulate MARC records in batch and determined how to train staff and design workflows to accommodate batchloading. However, poor record quality continued to trouble catalog and authority control librarians. Years of providing feedback on record quality to vendors had yielded mostly discouraging results. Although librarians had largely mastered the processes for correcting certain kinds of critical problems, dramatic increases in batchloading work indicated a strong need to develop more efficient and systematic batch editing processes. To that end, technical services managers charged a small group of two catalogers and one systems

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Submitted October 12, 2012; tentatively accepted November 28, 2012, pending revision; revision submitted January 11, 2013, and accepted for publication February 13, 2013.

Early versions of the study results reported in this paper were presented at the ALCTS Cataloging and Metadata Management Section Cataloging and Classification Interest Group meeting at the 2012 American Library Association Midwinter Meeting and at the ALCTS Publisher-Vendor-Library Relations Interest Group meeting at the 2012 American Library Association Annual Conference.

librarian to identify the most common issues, their prevalence, and their effect on access, with the goal of creating a streamlined set of local guidelines for batch editing MARC records for e-resources. Managers wished to understand which areas of the record required careful checking and which data could be safely assumed acceptable most of the time. Catalogers also wished to identify and track problems that were uncorrectable at the point of initial editing and loading but which were candidates for later maintenance, update, or enhancement. To address those questions, catalogers initiated a systematic study of record quality in vendor-provided e-resource records. This paper describes how catalogers analyzed record sets, and it outlines the results of their analysis, describing in detail many of the errors they discovered. The paper also discusses how the study's findings affected batchloading workflows at UML. The author enumerates several challenges to maintaining quality in batchloaded records and anticipates future challenges and opportunities to arise from evolving cataloging standards and library discovery tools.

Literature Review

Record quality is a frequent topic in the literature on e-books and the batchloading of e-book record sets. Wu and Mitchell provided a detailed overview of issues surrounding mass management of e-book records.[1] One major quality issue they discussed at length is the inconsistent use of identifiers, particularly in the context of the provider-neutral record. Wu and Mitchell also noted that cataloging standards varied widely between record providers and that the adoption of the provider-neutral record standard by record providers had been slow.

Luther's overview of the universe of book metadata (including e-books) discussed the myriad purposes served by book metadata and serves as a useful reminder that library standards do not meet the needs of all communities.[2] This is important context for her discussion of metadata quality, which alluded to how varying purposes can explain differing quality standards on the parts of publishers, vendors, and libraries. Luther emphasized the difficulty of measuring metadata quality: "In the current discovery environment, it is difficult to measure what is not found and extremely difficult to quantify the impact and cost of poor, incomplete, or missing metadata on business and collection analysis decisions that ultimately affect consumers."[3]

Minĉić-Obradović summarized the state of bibliographic control for e-books.[4] Her chapter in a 2011 monograph includes a brief discussion of two frequently observed quality issues in vendor-provided records: misleading identifiers and invalid MARC coding. Offering an example of quality improvements in records from a specific publisher, Minĉić-Obradović discussed the positive effects on the quality of Springer's MARC records after they contracted with OCLC to replace the records.

In a 2007 article reporting the results of a survey of how academic libraries provided web access to e-book collections, Dinkelman and Stacy-Bates discussed the importance of providing catalog access to e-books, emphasizing the importance of making a simple, format-based search limit available for e-books.[5] Although the authors found that 94 percent of libraries surveyed provided this type of limit, they cited record quality issues as a barrier to creating consistent, reliable format limits in catalogs.

Rossman, Foster, and Babbitt offered a broad overview of MARC record and catalog access issues for e-books.[6] In their list of questions librarians should routinely ask vendors about MARC records, the authors identified many quality concerns: use of authority control, presence of Library of Congress Subject Headings and call numbers, specificity of subject terms, presence of table of contents notes, and availability of corrected and updated records.

In a pair of papers on the topic of batchloading issues and practices in academic libraries, Mugridge and Edmunds addressed record quality from two slightly different angles. In their 2009 overview of batchloading advantages, challenges, and workflows, the authors noted the difficulties inherent in balancing record quality and timely improvement to access.[7] They observed that few record sets are perfect and that some errors are difficult or impossible to correct during preload editing. In their 2012 survey of batchloading practices in large research libraries, Mugridge and Edmunds reported on the effects of batchloading work on staffing, workflows, and quality.[8] They found that 76.5 percent of survey respondents had rejected record sets because of quality issues. Some of the reasons respondents gave for rejecting record sets included lack of authority control or subject access, bad data that would have been difficult or impossible to resolve through automation, incomplete title fields, character encoding errors, right-to-left text orientation errors, records lacking unique identifiers, nonstandard cataloging practices, and invalid URLs.

Two of the themes of Mugridge and Edmunds' work recur in several case studies that discuss specific record quality issues libraries found in preparing and loading records from a particular provider or collection: serious concerns about poor or nonexistent authority control in vendor-provided records and the sentiment that minimal-level access is preferable to having no access at all. Martin and Mundle described the process of editing and loading e-book records for a collection of Springer e-book titles at the University of Illinois at Chicago.[9] They outlined strategies for record

review and the types of problems they found, noting that many record-quality issues were "enduring and difficult to solve."[10] In addition to the presence of name and subject headings in unauthorized forms, major quality issues they found included bad and nonfunctional URLs and the presence of print version identifiers.

Beall described a similar project in which 100,000 low-quality records for freely available e-books were loaded into the University of Colorado Denver's local catalog.[11] He noted several issues with the initial quality of the records, particularly in the realm of authority control, many of which arose because the records had been derived from non-MARC metadata: qualifiers and dates were missing from name headings and all subfields other than subfield $a were missing from subject headings. Beall discussed the effect of missing or bad data on the catalog, including split heading files and problems with diacritics, but concluded that some catalog access was better than no access.

Sanchez, Fatout, and Howser described the analysis and cleanup of NetLibrary records in preparation for loading into the catalog at Texas State University-San Marcos.[12] The authors observed numerous quality issues based on deviation from established in-house cataloging standards. Although the authors were able to resolve many problems before loading, they noted some ongoing authority control issues.

Authority control in batchloaded records is the central concern of Finn's article, in which she described how the Newman Library at Virginia Tech conducts authority control processing before batchloads are completed.[13] Finn noted that the quality of record sets varies widely and that authority control problems are very common.

Preston wrote about the OhioLINK Database Management & Standards Committee's (DMSC) cooperative e-book cataloging projects.[14] While this was a case study of a manual e-book cataloging project rather than a batchloading project, Preston noted that "concerns about bibliographic record accuracy, retrievability, and adherence to cataloging standards"[15] were among the reasons that DMSC opted not to use vendor-supplied records. These concerns included a lack of Library of Congress Subject Headings (LCSH) and Medical Subject Headings (MeSH), name headings not in authorized forms, the presence of print version ISBNs, serials cataloged as monographs, and the cataloging of reproductions (before 2009) as if they were born-digital.

Record quality is a concern for libraries well beyond the realm of e-books and batch processing. Several papers that discussed quality standards for catalog records and metadata more generally are helpful in providing a broader context for the present study. Studies of quality in traditional cataloging offer an interesting point of comparison. In a 2005 survey of academic libraries, Lam found that the vast majority of respondents viewed the quality of outsourced cataloging as generally good in terms of accuracy, consistency, adequacy of access points, and timeliness.[16]

El-Sherbini evaluated the quality of Program for Cooperative Cataloging (PCC) BIBCO records in the Ohio State University (OSU) catalog. Like many libraries, OSU uses the services of an authority control vendor (in this case, Backstage Library Works) to verify and correct headings. El-Sherbini analyzed the changes made by the authority control vendor during post–cataloging authority processing.[17] She found that the majority of corrections could be viewed as minor and did not affect catalog retrieval, including changes to punctuation, diacritics, and spaces. El-Sherbini also identified corrections that might affect access, including indicators, subfields and delimiters, tags, spelling errors, and forms of subject headings. She found that a very small number of records were affected by these issues and concluded that the overall quality of PCC records was high.

Discussions of metadata quality outside the realm of traditional cataloging also have some relevance for quality evaluations of MARC metadata. Bruce and Hillman proposed a set of broadly relevant metadata quality measurements and metrics: these are completeness, accuracy, provenance, conformance to expectations, logical consistency and coherence, timeliness, and accessibility.[18]

In a 2008 paper, Hillman compared quality evaluation for non-MARC metadata to that for MARC metadata.[19] She noted that most problems identified in quality studies of MARC records were either typographical errors or outdated headings. Hillman argued that non-MARC metadata quality should not be assumed to be the same as in MARC metadata but should "instead be based on criteria more closely tied to the functionality sought for applications using metadata," meaning that there is "no one answer to the quality question."[20]

Finally, some recent literature inquires more broadly into the concepts of record quality and quality measurement. In a 2008 article, Bade discussed the concept of a "perfect bibliographic record," observing that it is hard to define record quality in any absolute sense.[21] The author suggested that libraries should consider the following in developing quality criteria: "1. What data elements are useful for the kind of library research performed here in this particular institution? 2. How much, and which elements of that necessary information can this institution afford to support?"[22]

Hider and Tan examined how catalog record quality might be assessed through research into catalog use.[23] The authors proposed that quality can be assessed either "impressionistically" or "systematically," or through a combination of both approaches.[24]

Impressionistic assessment relies on catalog users' self-reported behaviors and preferences while systematic assessment relies on algorithmic or expert evaluation of user behavior and errors in bibliographic records. The authors noted that standardization is a key element in catalog effectiveness. Through survey results, Hider and Tan found that both libraries and library patrons believed that most elements of catalog records were useful for identification and selection. They concluded with a call for "evidence-based cataloging," in which localized and detailed evidence provide the means to measure the effectiveness of cataloging practices.[25]

Method

The project group devised evaluation rubrics based on two widely adopted current standards for e-book records: the Program for Cooperative Cataloging's (PCC) MARC Record Guide for Monograph Aggregator Vendors,[26] and the PCC's Provider-Neutral E-Monograph MARC Record Guide.[27] Based on these documents, two checklists were created: one that included specific fields with PCC and local expectations for content in each field (appendix A), and one that listed generic issues in conflict with PCC and local standards that staff had identified while working with record sets before the formal beginning of the study (appendix B). During the analysis, catalogers also maintained a list of specific problems found in individual records. Finally, original, unedited files for each record set were archived for later reference.

Catalogers evaluated record sets using MarcEdit and Excel as part of normal preload editing processes. They identified some problems whenever they were present, such as problems that affected all records in a particular set, or certain critical errors affecting a subset of records, such as missing URLs; the fields and values that received this level of analysis are indicated in the specific field checklist with a mark in the "Full check" column. Catalogers identified some problems that typically did not affect all records in a set, such as errors in authorized forms of name and subject headings, or simple typographical errors, through selective spot checks of individual records within a set; those fields and values are indicated with a mark in the "Spot check" column. "Full check" fields and values were those that could be checked programmatically by machine with relative ease, while "spot check" fields and values required the cataloger to review individual records. Between July 2011 and August 2012, catalogers analyzed eighty-nine record sets from nineteen different providers, with the number of records per set varying between a handful and several thousand. Most sets had between 100 and 1,000 records. Most record sets were for e-books, but some sets for monographic electronic items in other formats were included, such as scores, sound recordings, and video recordings.

Catalogers divided the problems they discovered into three categories: errors or omissions that could affect access (e.g., missing or incorrect access points, identifiers, or linking entry fields); errors that were unlikely to affect access (e.g., erroneous physical description, misleading 5XX notes); and critical errors, those errors which required resolution before records could be loaded (e.g., MARC encoding problems, missing or bad URLs/URIs). Catalogers also noted usage of obsolete coding and field tags. Table 1 shows how librarians categorized the various types of errors.

Some error types within each category are more serious than other types. The seriousness of the error does not necessarily correlate with the level of effort necessary to correct it, as the discussion of findings will demonstrate.

Findings

All of the eighty-nine record sets exhibited at least one error. About one-fifth displayed critical errors, while the vast majority of sets displayed at least one access error. A few sets exhibited only "other errors," those deemed unlikely to affect access, though very few of the sets fell into this group.

Based on the large number of sets exhibiting access errors and other errors, most sets clearly had more than one type of error. Thirteen sets showed all three types of errors.

Discussion of each error category follows, along with some of the more notable and interesting specific errors and the steps catalogers took to correct them.

Critical Errors

This category contained errors that were "show stoppers," problems that meant the records could not be loaded without correction. Many of these were MARC coding errors that would affect indexing. In one set, no indicators were present in any MARC field. This held true for every record in the set. The set was large enough that it was not feasible to make the corrections locally, and the library did not load the set until the vendor corrected the errors. In another set, most indicators had been replaced by punctuation marks, a problem which again appeared in every record in the set. Catalogers and systems staff could not determine exactly what might have caused this issue, so correcting it was challenging. A third set contained a large number of seemingly random invalid MARC field tags, indicators, and subfield values, present in about 30 percent of the records in the set. The only way to correct these problems was to fix each individual record. Since this was a relatively small set (fewer than 200 records), it was possible to do this, but in a much larger set, making such corrections would

Table 1. Categorization of Errors Found in Record Sets

MARC Field(s)	Error Description
Critical Errors	
N/A	Record length exceeding 22,000 bytes
All	Invalid MARC coding/tagging
001, 035	Missing control number or other unique identifier
856	Missing or bad URL/URI
Access Errors	
LDR, 008	Missing or incorrect values in LDR or 008
006, 007	Missing or incorrect values in 006/00 and 09 or 007/00-01
010, 020, 035	Identifiers for print versions coded in 010, 020, or 035 $a
050, 090 $a	Missing LC class number
1XX, 240	Missing main entry (name or uniform title)
7XX	Missing or inappropriate name heading
1XX, 7XX	Unauthorized form of name(s)
1XX, 24X, 6XX, 7XX, 8XX	Typographical error(s) in access points.
245 $h	Missing general material designation (GMD)
6XX	Missing subject heading(s)
6XX	Unauthorized form of heading(s)
6XX $v $x $y $z	Missing subdivision(s)
Other Errors	
260	Missing or incorrect place, publisher, or date of publication
300	Missing or incorrect physical description
4XX, 7XX, 8XX	Presence of vendor-specific series or names
440, etc.	Presence of obsolete MARC tags
506, 516, 530, 533, 534, 538	Presence of obsolete note fields
776 (or other 77X/78X)	Missing, incomplete, or incorrect linking entry field

Table 2. Number of Sets with Errors in Each Category

Category of Error	Number of Sets
Critical errors	17
Access errors	85
Other errors	65

Table 3. Combinations of Error Types

Error Types Present	No. of Sets
Critical, Access, and Other	13
Critical and Access	2
Critical and Other	1
Access and Other	49
Critical only	1
Access only	21
Other only	2

involve an inordinate amount of time and effort.

Other critical errors affected only a small number of records in each set. In one set, 8 out of more than 700 total records were missing any kind of system number or unique identifier. Although supplying locally devised identifiers was a simple solution to the immediate problem, this is a less-than-ideal choice in view of longer-term maintenance, which often requires using the unique identifier as a match point when records need to be selectively deleted or overlaid with updated versions. In a handful of other sets, the length of one or more records exceeded 22,000 bytes, the record size limit of the library's ILS. These sets all consisted of records for either online sound recordings or video recordings, formats for which longer records are common. In each of these cases, however, the excessive record lengths were the product of poor cataloging choices: a number of loosely related titles had been combined in a single bibliographic description. These records had hundreds of 7XX fields and URLs, making them unusable in most library catalogs. Librarians had no choice but to remove the problem records from the sets before loading and to report the issue to the record providers. Catalogers decided that the only real option for providing meaningful access to these titles was to manually catalog each separate work included in the problem records.

Finally, missing, broken, or misleading URLs also qualified as critical errors. Some URL problems affected every record in a given set, while others were specific to individual records. In two sets, all of the URLs were badly formatted and nonfunctional. A brief investigation into the structure of title-level "permalinks" given on the provider's website yielded an easily implemented fix for the problem. In the URLs for two other sets, the presence of unencoded non-ASCII characters caused link failure in local systems. Properly encoding the URLs solved the problem. While correcting the problems in these cases was not difficult, the corrections were only successful because the existing URLs were "mostly correct," and their errors fell into recognizable patterns. In another set, all URLs were bad, but catalogers could not identify a pattern of errors common to all of the records that would have made batch correction possible. The only solution

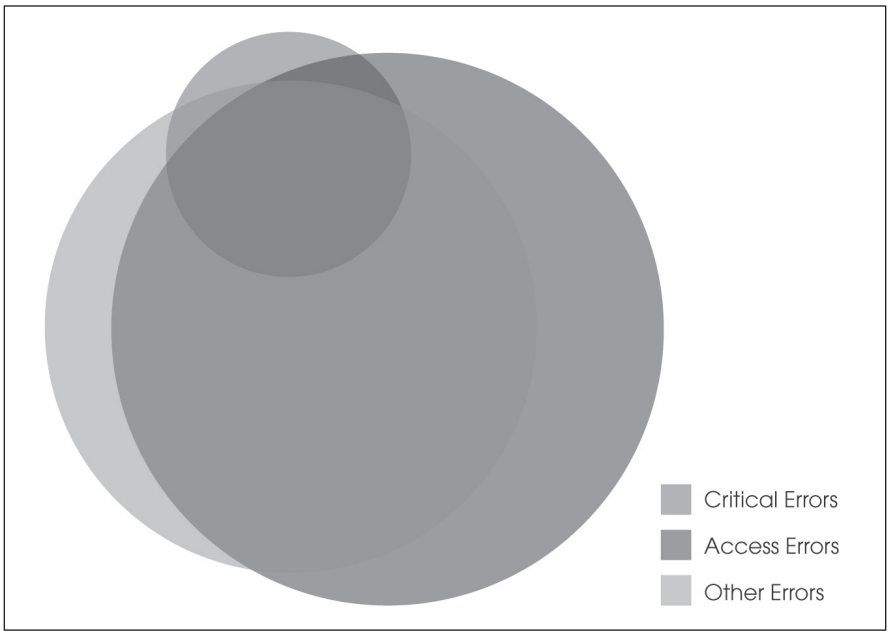

Figure 1. Overlap between Error Types

in this case was to correct the URLs one at a time. Finally, one set lacked URLs entirely. The records in this set had clearly been derived from records for print versions of the books, but the provider had neglected to add links before distributing the records. This set was reported to the provider for repair and reissue.

In two sets, most URLs were present and accurate, while a very small number of records lacked URLs entirely. In two other sets of provider-neutral records—which included multiple URLs for various providers—a small number of records in each set had no URL remaining once catalogers had removed links for providers to which the library did not have access. In all of these cases, identifying those records and supplying URLs manually before loading was a relatively simple, though time-consuming, matter.

Errors that May Affect Access

Errors that had the potential to affect discovery and retrieval made up this category. While the presence of such errors would not prevent records from being loaded, catalogers felt that these errors should be corrected before loading if possible, or noted for possible post–load correction if not. Although many of these errors were simple typographical errors in access points, a number of other subcategories emerged over the course of the analysis: these included problems with identifiers, crosswalking and record derivation errors, misapplication of cataloging rules, MARC coding errors, and omissions or inconsistencies likely to result in misleading or incomplete catalog retrieval.

One of the most common types of access errors was incorrect use of identifiers. A number of other studies on batchloading and e-book records have addressed the difficulties in ensuring that each record in a set has at least one accurate identifier correctly coded, and the problems that can arise when records contain bad identifiers. In Wu and Mitchell's 2010 article on batch management of e-book records, they noted that "lack of a reliable identifier to collocate equivalent manifestations on an automated basis" is "a significant obstacle to full adoption of the provider neutral standard at the local level."[28] Martin and Mundle cited confusion between print version identifiers and e-version identifiers as a substantial problem that blocked loading and caused overlay hazards in batchloading at their institution.[29]

In a large number of sets, ISBNs for both print and e-books were coded in the MARC 020 subfield $a. In cases where ISBN qualifiers were routinely supplied, this could be corrected in batch with a high degree of confidence. When no qualifiers were present, correcting the problem was very difficult. Many sets also included OCLC numbers for print version records when e-version records had been derived from those records. This is obviously problematic for reporting holdings to OCLC and any kind of batch maintenance that relies on accurate OCLC numbers. Omissions of various identifiers also occurred frequently. In a few sets, linking entry fields (MARC 776) were present on at least some records, but they did not include an identifying number, or they included identifiers for multiple discrete bibliographic entities (e.g., ISBNs for both print and e-books in the same 776 field).

Another type of access error was present in a handful of sets where vendors had generated MARC records by crosswalking, or converting, metadata used in their internal systems into MARC. These are not cataloging errors *per se* since the original non-MARC records presumably conformed to the vendor's own standards, but rather issues resulting from the imperfect translation of the original metadata to MARC that could inhibit access in a MARC-based catalog. Catalogers saw several examples of this. In one set, geographic data that was present in the provider's internal metadata (which they had also made available) was not present in the MARC records based on that metadata, even though it could have been mapped to a MARC 043 field (or perhaps to a geographic

subdivision of a subject heading). In another set, all subject and descriptor terms were from unspecified, presumably internal, controlled vocabularies. To complicate matters, each term was preceded by an alphanumeric code that was meaningless outside the provider's internal repository. Subject terms in this set were also both too specialized and not descriptive enough for a general catalog, including very specialized discipline-specific terms and lacking more general relevant terms from LCSH or MeSH. Finally, in all of the record sets that fell into this category, name headings did not appear in authorized forms. Although automated or outsourced authority processing could be expected to correct many of these, a large number of headings would either be changed in error, or would be unable to be matched and corrected by these methods.

The derivation of e-version records from older print version MARC records, a process that can produce similar (if less severe) problems to crosswalking from other metadata schemes, resulted in a related type of error. In several sets consisting primarily of materials published and cataloged in the pre–*Anglo-American Cataloguing Rules, 2nd ed.* (*AACR2*) era, catalogers found a number of obsolete subject headings and subdivisions that had apparently been carried over from print version records for those titles. These errors fell into the category of those that could reasonably be corrected only in post–load authority processing. In the same sets, some records also used obsolete MARC coding.

A type of access error seen mostly in sets for non-book materials appeared to arise from misunderstanding or misapplication of cataloging rules. In some sets for streaming video, many records incorrectly gave the director or producer as main entry, when title main entry would have resulted from proper application of *AACR2*. In a set of records for music scores, uniform titles, if they were present at all, appeared in MARC 7XX fields rather than in the MARC 240, required for proper name/title indexing under personal name main entry. Another set of records for scores was missing form/genre subdivisions to indicate whether the resource was a score, a score and parts, or parts only. These missing subdivisions would have caused collocation issues in the traditional library catalog, and would have caused incorrect format faceting in the library's discovery layer, Ex Libris's Primo.

Incorrect or missing MARC coding in fields 006/007/008 is another type of access error that catalogers found frequently. Like the missing form/genre subdivisions discussed above, missing or incorrect values in certain positions of the fixed fields causes system-specific issues for format limiting and faceting. In several sets, at least one record was missing the 007 field for electronic resources. In some sets, the 006 field was missing from all records, while in other sets, the 006 field supplied was for textual materials rather than for electronic resources. Finally, in one set of records for streaming video, the 008/33 value necessary to indicate that video recordings were the type of visual material represented was absent, causing the library catalog and discovery system to interpret the format of the included titles as books rather than videos.

One other type of omission was counted as an access error: the lack of a Library of Congress classification number in the MARC 050 or 090. In many sets, this information was present on some records in a set but not all. Although e-books do not require a call number for shelf placement, many discovery systems rely on Library of Congress call number information for search faceting. The absence of this data means that a user who narrows search results via facets could inadvertently exclude relevant results because their records lack the requisite data to populate that facet.

Catalogers placed one issue in the category of access errors that is not strictly an error, but rather an inconsistency: in a number of sets, entries for the same series title were traced on some records but untraced on others. According to standards, either choice is acceptable, depending on local preference, but a mix of traced and untraced for the same series headings within a single set is problematic in library catalogs and discovery systems that index series titles because mixed practices produce inconsistent and incomplete search results.

Both the scope and the potential effect of access errors varied widely. Within a set of several thousand records, the effect of a set-wide omission is much greater than that of a few missing fields or values. On the other hand, consistency makes such problems easier to identify, and often, to fix. In many cases, these errors were actually omissions of data that catalogers considered necessary to full-level cataloging records, such as subject headings or format-specific coding. Omissions of data that could be expected to be different for each title, such as Library of Congress call numbers or ISBNs, were generally not difficult to identify, but were among the most difficult errors to correct. Finally, some errors fell into a gray area: they might affect access or not depending on local preferences, system implementations, and user needs. In these cases, catalogers chose a category based on local circumstances but recognized that other libraries might differ.

Errors Unlikely to Affect Access

In this category, catalogers placed all other identified errors that did not clearly fall into either of the other two categories. One type of identifier problem was not categorized as an access error, though a case could be made for doing so: inconsistent treatment of digital object identifiers (DOIs). In some sets, DOIs were given as URLs. This is a commendable practice, since

DOIs are permanent and can be expected to provide greater stability than typical URLs. However, in a small number of sets, although many or most records had DOIs appearing in MARC field 024, those DOIs were not given as URLs. Instead, the URLs supplied in MARC field 856 were typical URLs presumed not to have the same level of stability as the DOIs for the same titles. Ideally, when DOIs exist, they should be given in both the MARC 024 and in URL form in the MARC 856. URL maintenance is a substantial ongoing workload in most libraries, and making use of all available tools to reduce that workload is highly desirable.

Another problem that fell into the gray area between access errors and other errors is the absence of linking entry fields. The most useful and relevant of these fields for e-books is MARC 776, which provides a link to a bibliographic record for the print version of a title, ideally via a record identifier such as an OCLC number or a LCCN. Almost all of the record sets evaluated in this study were missing this element, either in whole or in part. Although a lack of linking entry fields has a negligible effect on access in many discovery systems at present (including those currently in use at the University of Minnesota), the gradual move toward relationship-entity models means that linking entry fields will likely become more important soon. Linking entry fields as they are commonly used in e-book cataloging offer one way to collocate related manifestations of the same work. Including them in current bibliographic records is one small way of preparing records for a future beyond MARC, since linked data models that may succeed MARC rely on record identifiers to pull together information from various sources to offer more comprehensive and interlinked descriptions of works, authors, and other entities.

A number of errors deemed unlikely to affect access arose as a result of partial or imperfect implementation of the provider-neutral record. A large number of sets that were otherwise compliant with provider-neutral standards included entries for provider names or series. While many libraries (including the University of Minnesota) still opt to include this information in e-book records, full adherence to the provider-neutral guidelines would exclude it. Similarly, some record sets included publisher and date information in the MARC 260 for that provider's specific version of an e-book, rather than the original publisher and date as required by the provider-neutral standard. Although this study did not count this as an access error, Wu and Mitchell noted that they had observed "a user preference for seeing the original publisher and date information in the publication area."[30] Most of the sets that had provider-specific information in the MARC 260 included publisher and date of the original publication in the MARC 533, according to the practice of cataloging electronic reproductions that dominated e-book cataloging before the implementation of the provider-neutral record for monographs.[31] The record sets analyzed exhibited a mixture of former, current, and ad hoc practices in the MARC 300. Although the provider-neutral standard's recommended phrase "1 online resource" was frequently seen in 300 subfield $a, it was often not used consistently throughout a set, and was missing entirely from many other sets, usually in favor of the older recommended usage "1 electronic resource." Another physical description error observed was the direct transcription of the MARC 300 field from the print version record, often including even subfield $c (dimensions), which is inappropriate for e-books.

The presence of obsolete MARC 5XX note fields was another error type deemed not likely to affect access. A large number of sets exhibited this error. Not surprisingly, these were usually sets that failed to follow provider-neutral guidelines (or that followed them imperfectly). Finally, a large number of sets also included the obsolete MARC 440 field tag for series headings. Since most systems still index 440, catalogers did not consider this to be an access error, though it was generally corrected to valid coding as a 490/830 field pair.

Discussion

Catalogers made a number of general observations about their findings as they conducted analysis and editing of record sets. Over the course of the study, it became clear that e-book vendors were slowly adopting the provider-neutral record. With some exceptions, record sets evaluated later in the study were more likely to make at least some attempt to adhere to the standard. Although many types of errors appeared whether records were provider-neutral or not, gradually expanding use of the standard meant that the variety of errors narrowed and became more predictable, enabling more efficient preload editing. It is clear that the effect of the provider-neutral standard has been a positive on the quality of vendor-created records as well as those created by library catalogers.

Catalogers were surprised by the relatively small number of truly critical errors they found. Based on prior experience and informal conversations with colleagues at other institutions, there was a perception that many more record sets were critically flawed than turned out to be the case. Even for sets with critical errors, catalogers found that most could be fixed without excessive effort. Only four of the sets evaluated during the study were rejected entirely for loading. In these four cases, other means were explored to provide title-level access for the record sets in question.

If the rarity of critical errors was a pleasant surprise, both the variety

and frequency of access errors was an unpleasant one. In particular, access errors that were usually identifiable only through spot checks, such as unauthorized forms of names and subject headings, and typographical errors in titles and names, were troubling, since these errors were typically both the most difficult to find and to correct. Catalogers had little confidence that spot-checking found all or even most of these errors, especially in larger record sets. Moreover, although the prevalence of identifier errors had been anticipated, the difficulty in accurately identifying and re-coding print version identifiers in batch was a particularly vexing problem. Since accurate identifiers are critical for long-term catalog and collection management, this problem demands a substantial amount of cataloger time and attention. However, on the positive side, the variety of access errors encountered in fixed field coding helped to refine and expand local checklists and editing procedures, increasing catalogers' confidence that coding errors for various formats would always be discovered and corrected before loading.

Inconsistencies in record sets from the same providers, though they are not errors in and of themselves, represent another significant problem. Catalogers confirmed what they had casually observed before the study, which is that successive record sets from the same vendor, even for the same collection, do not exhibit consistent errors. Consistency is very helpful for the most efficient and accurate processing and flexibility in workload distribution. When records from the same provider do not display the same problems from set to set, libraries are forced to reevaluate each new set. It should be noted that some inconsistencies are the result of the gradual adoption of the provider-neutral standard, an unquestionably positive development, but others are not related to provider-neutral changes. The unpredictable nature of problems found even in record sets from the same vendor supported catalogers' assertion that new sets always needed their evaluation before loading.

Ultimately, catalogers concluded that there is no meaningful way to generalize about the most common errors across the full range of record sets. The wide variety of errors and inconsistencies of practice, though somewhat improved by wider adoption of the provider-neutral standard, mean that it is very hard to predict what errors one will find in any given record set. This is not to say that the records of many individual providers do not exhibit identifiable characteristics and typical errors, but there is very little that applies across the board. Despite these challenges, catalogers at UML were still able to improve and refine local processes for record set editing based on the results of the study. Although catalogers and systems librarians had long worked from a pre–load set editing checklist, the results of this study provided ample data to inform a thorough revision and expansion of that checklist (appendix C). The data also supported continuing the time-consuming practice of spot-checking some records in each set. Having an inventory of previously observed issues allowed catalogers to document strategies for identifying and fixing the most egregious problems. Additionally, catalogers have documented errors common to particular vendors, which helps to focus analysis and editing efforts for new sets from the same vendor on the most likely problems. Finally, less critical problems affecting access that catalogers could not easily fix before loading are now routinely documented for potential retrospective correction or record upgrades, if and when they are possible.

Conclusion

This study offers a "worm's-eye view" of the quality issues in e-book record sets, focusing on detailed evaluation of discrete elements in individual records. Viewing the results from a broader vantage point suggests a number of strategies that libraries might pursue to address these issues. One lesson learned is that more and better-coordinated communication with record providers could help improve their offerings. Unfortunately, experience has shown that not all vendors and providers are interested in making the kinds of improvements to their record sets that libraries want, nor do all libraries convey a consistent set of needs to record providers. The typical current flow of communication, where vendors create and distribute records, libraries locally edit and upload those records, and then sometimes give the vendor feedback about problems in the records, has not proven especially effective in actuating large-scale improvements to record quality. Martin and Mundle observed that "vendors are attempting to automate record creation as much as possible, and changes at the title-level are improbable. The key for efficiency for both libraries and vendors will be to create a high-quality description of each e-book that can be reused and repurposed by any number of libraries to create quality catalog records."[32] The kind of collaborative effort Martin and Mundle hint at is a promising way forward that libraries and vendors should pursue. Libraries understand their specific needs better than vendors, and perhaps it is not realistic to expect vendors to meet exacting library standards when they are generally offering record sets for no additional charge beyond the price of the content. This is not to say that vendors should not meet a minimum standard. The PCC's "MARC Record Guide for Monograph Aggregator Vendors" provides an excellent starting point, yet the standard could prove too difficult for some vendors to meet. When vendors are unable or unwilling to meet a minimum standard for their records,

libraries should consider organizing a formalized, wide-scale repository or clearinghouse for the sharing of record sets that have been edited to meet a baseline standard. As a starting point, record sets could be shared within cons78041ortial or regional groups of libraries. Eventually, a national effort along the lines of the Program for Cooperative Cataloging (PCC) could manage such a clearinghouse. Another possible path for OCLC subscribers is the WorldShare Metadata service, a relatively new service that automatically provides locally tailored sets of records and a shared environment for their maintenance for the collections a library has activated in the WorldShare knowledge base. Although records are not yet available for all collections, and the service is too new for its long-term effectiveness to be known, it has the potential to help individual libraries maintain the desired level of quality in their e-book records.

The growing level of adoption by vendors of the provider-neutral standard is encouraging. However, major changes in cataloging standards are coming soon. The implementation of *Resource Description and Access* (*RDA*) is already a reality for many libraries, and will be so in many more within the next year. But, because RDA training and implementation is a resource-intensive activity, and because OCLC will not require libraries to contribute *RDA* records, it is possible that some libraries will choose to continue cataloging under *AACR2* rules. It is not obvious how the provider-neutral model will align with *RDA*, whose basic principles seem to disallow provider-neutral cataloging. Fortunately, the PCC has already done much work toward reconciling the provider-neutral standard with *RDA*.[33] Nevertheless, as libraries saw with the original provider-neutral standard, widespread implementation is likely to take years. In the meantime, catalogers are likely to see a mix of *AACR2* and *RDA* practices in vendor-provided e-book records. An issue not directly related to *RDA*, but to standards in general, is the proliferation of identifier systems, many of which libraries, publishers, vendors, and retailers may come to rely on as they move toward an environment in which linked data plays a central role. Luther addressed this in her overview of the book metadata landscape, proposing exploration of expanded use for the International Standard Text Code (ISTC) and International Standard Name Identifier (ISNI) standards.[34] If these standards come into common usage, libraries must strongly consider including them in bibliographic and authority records.

Other nascent trends indicate that batchloading may become a less important activity for libraries soon; it already has for some. These are the generation and extraction of bibliographic records from ERM knowledge bases, and the presence of title-level metadata for e-monograph collections in web-scale discovery systems such as Serials Solutions' Summon Service and Ex Libris's Primo Central, which offer unified indexing across metadata for many types of library resources from a variety of repositories and sources. Wu and Mitchell noted that the use of records derived from their library's ERM knowledge base had streamlined the University of Houston's batchloading workflows, but they also noted that many of those records contained very minimal bibliographic information.[35] Preexisting records in web-scale discovery systems might also contain minimal information, though in some cases, these systems may have better, more complete, metadata than that available in the MARC records provided by some vendors. The balancing act between providing minimal access and full cataloging is one with which libraries are very familiar. The questions that librarians must answer when implementing these solutions are the same for batchloading as they have always been for traditional cataloging: what is gained in terms of efficiency and cataloger time? What is lost in terms of access and standardization? How important for user discovery needs is the additional access provided by full-level cataloging?

It is hard to overstate the value of the library community's hard work on standards for e-monograph records. But the growing complexity and variety of locally implemented systems, from back-end ILSs, ERMs, and link resolvers to front-end OPACs and discovery systems, means that those standards can serve only as a starting point. Each library must determine what it needs for its own discovery tools. The plethora of options in catalog and discovery systems means that functionality and dependencies even for something as simple as a format limit can vary widely. General studies on metadata and record quality point to the importance of contextual and local applications in any evaluation of quality. Although standards are an excellent and necessary starting point, there is no one-size-fits-all definition of record quality. Libraries must consider widely accepted standards in tandem with the needs of their own users and discovery systems as they make choices for evaluation of record sets and local record enhancement.

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Appendix A. Specific Field Checklist for Record Evaluation

MARC Field	PNR	MAV	UMN	Details	Full Check (F) or Spot Check (S)
LDR/06-07		M	M		S
LDR/17		M		Check for misleading values. (MAV recommends Elvl 3 unless "constructed according to AACR2").	S
001/003	N/A	M		Confirm presence of unique control numbers. Where applicable, confirm that number is retained for subsequent iterations of the same record.	F
006	M	M	M	006/00 = m, 006/09 = d for books. Optional additional 006s if reproduction.	F
007	M/A	M	M	007/00 = c, 007/01 = r.	F
008/06-14		M		Check date(s) against 260 $c.	S
008/15-17		M		Check place of publication against 260 $a.	S
008/23	M	M	M	008/23 = o	F
008/28		M		Evaluate only for known government publication sets.	F
008/35-37		M		Check for correct language of content.	S
010	A	A		Do not use for print LCCN; put in 776.	S
020	A	A		Electronic ISBN in 020 $a; others in 020 $z; if in doubt 020 $z; also copy print ISBNs to 776. Check for qualifiers.	S
024		A		Check for presence and type of identifier. Note inclusion of DOIs. Do not verify individual numbers unless there is evidence of a problem.	F
035		O		Check for OCLC number. If present, verify it correctly identifies electronic version.	F
040	M	M		Do not put code for agency that did the print record here.	F
050/060/082/086/[090]	O	O		Check for presence of field only. Do not evaluate for correctness.	F
1XX/7XX	N/A	A		Check for presence of name headings; check if appropriate; check if authorized; check if any 710s identify vendor.	S
245 $h	M	M	M	Check for presence of correct GMD.	F
246	A	A		Check if provider-specific titles are given here.	S
250	A	A		Check for provider-specific edition statements.	F
256	X	X		Verify that this field is not used.	F
260	M	M		1st named publisher should apply to all known online versions. If reproduction, then 260 should be for print publisher	S
300	M	M		1 online resource (pagination optional)	F
490/830	A	A		Present if applicable; traced; authorized. Should not include provider-specific series.	S
506	X	X		Verify that this field is not used.	F
516	X	X		Verify that this field is not used.	F
530	X	X		Verify that this field is not used.	F
533	X	X		Verify that this field is not used.	F
534	X	X		Verify that this field is not used.	F
538	X	X		Verify that this field is not used.	F
583	X	X		Check if preservation information is applicable to these records	F
500/588	A	A		If "Description based on" note is used, 776 should also be present.	S
6XX	N/A	O		Check for presence of subject headings; check for source vocabulary (note if vendor's vocabulary); check if authorized. Describe specific issues in spreadsheet.	S

Appendix A. Specific Field Checklist for Record Evaluation (cont.)

MARC Field	PNR	MAV	UMN	Details	Full Check (F) or Spot Check (S)
655	N/A	O		Check if genre/form headings given; check if any indicate electronic format.	S
776	A	A		Use if print original is known. Check for presence and correct use of $z, $w.	S
856	A	M	M	Check if URL is non-institution specific; check for $3, $z; check if it actually points somewhere, and to the right resource. Check for presence of multiple URLs (if supplied directly by vendor, do they ensure that their URLs are the only ones present?) Check for additional URLs for related content, e.g. LC TOC URLs.	S

Legend

PNR Requirement of "Provider-Neutral E-Monograph MARC Record Guide." (PCC document)
MAV Requirement of "MARC Record Guide for Monograph Aggregator Vendors." (PCC document)
UMN University of Minnesota requirement
M Field is mandatory
A Field is mandatory if applicable
O Field is optional
X Field is obsolete

Appendix B. General Issues Checklist for Record Evaluation

- Are there miscellaneous character errors?
- Are there errors in vernacular characters, diacritics, special characters?
- Does record correctly identify the same work? Does it correctly identify the same expression (edition)?
- Are identifiers (e.g. DOIs, ISBNs, OCLC numbers) present? Do they correctly identify the work and edition? Do they identify the electronic version?
- Is a data element provided that serves as a record identifier? Is it unique within the set? Is it consistent between iterations of the same record?
- Are name headings authorized?
- Are subject headings provided? Are they authorized? Which thesauri? Does the coding correctly represent the source vocabularies?
- Are series entries provided? Are they traced? Are they correctly authorized? Are correct ISSNs provided? Are correct volume numbers provided?
- Correct coding for source vocabulary, etc.
- Is MARC coding valid?
- How were records derived? (e.g., crosswalked from vendor database, cloned from existing copy, etc.) Does mapping to MARC include all relevant data?
- Are records consistent with other sets from the same provider?

Appendix C. University of Minnesota Editing Guidelines for E-book Record Sets

The following fields and values should generally be present on bibliographic records for electronic book collections (and other collections of monographic electronic resources) batch loaded into Aleph. This list is not necessarily exhaustive; specific collections may require additional fields and/or coding changes.

Note: During the editing process, save altered but unfinished files to L:\IT\ET\Records\RecordsPending. Do not overwrite the original files in RecordsIn. Original files will be archived.

Note: Before beginning, determine whether there are any serial records in the file by examining LDR fields. If any are present,

extract them into a separate file using Tools/Select MARC Records/Extract Selected Records and edit them separately.

Note: Before finishing, spot check access points on several records for authorized forms of names/headings and typos. Use your judgment to determine how many records to spot check; if the set is generally high-quality and from a more trusted provider, spot check fewer records. If the set has many problems, or is from a new provider or a provider with many known issues, spot check more records. Note any severe or widespread problems you can't easily fix with MARCEdit in the spreadsheet for post-load correction.

MARC field	Required coding/elements
LDR/09	If records are not UTF-8, convert the file to UTF-8 encoding.
001/003	Verify presence of a control number in 001 and a qualifying code in 003. If field 035 exists on all records and accurately references e-version records, delete the 001 and 003.
007 (electronic resources)	Code as follows: 00 c 01 r 03 usually c; use fill character if adding 007 04 n 05 blank 06-13 fill characters
006 (electronic resources)	Code as follows: 00 m 05 blank (if adding 006, use fill character) 06 o 09 d 11 blank (if adding 006, use fill character)
007	For non-textual resources (except music scores), 007 fields should be present and accurately coded for the specific type of content.
008	For all resources: 008/23 o For non-textual resources, check format-specific positions in 008 for accurate coding (note especially 008/33 for videorecordings)
020	Verify that any ISBN in 020 $a is for e-version; move print ISBNs to 020 $z and 776 $z
245	Verify presence of GMD $h [electronic resource] (follows $a, n, and p; precedes $b and c).
300	In $a, use 1 online resource. Pagination may optionally follow in parentheses, as well as $b indicating the presence of illustrations, etc. If $c is present, delete it.
440/490	If 440 fields are present, copy them to 830 fields, then retag all 440 fields as 490 first indicator 1.
506/533/540/583	Delete these fields if they contain provider-specific information.
516/530/538	Delete if present. These fields are obsolete.
710 or 830	Add the established form of the provider name, or the established series heading for the collection. Note: This field is included to facilitate easy retrieval of all records belonging to a particular set for ongoing maintenance. Choose one or the other based on the model for subscription and record provision: use the provider name if there is a single subscription to all of the publisher's e-book content (e.g. Brill); use the collection/series title if a publisher offers multiple collections with distinct titles and content (e.g. North American Theatre Online, one collection of many offered by Alexander Street Press). For sets containing records that are additions to previously loaded sets, make sure that the form of name or series is the same as that used for previous loads.
856	Verify that only one URL per volume represented on the record is present, for the correct provider. Delete URLs for other providers. Add the proxy prefix to URLs. Add $y click-on text.

Notes on Operations

Shared Resources, Shared Records

Letting Go of Local Metadata Hosting within a Consortium Environment

Charles Pennell, Natalie Sommerville, and Derek A. Rodriguez

Many libraries share regional, statewide, or even national union or consortium catalogs to enable consolidated search and display of participant holdings. These catalogs typically duplicate search capabilities provided by individual libraries' local catalogs. Search TRLN is a discovery layer built to support both group and individual library catalog interfaces for the four member institutions of the Triangle Research Libraries Network. In 2010, the Shared Records Pilot Task Group extended this shared catalog concept to the individual bibliographic record level. In this model, individual member libraries assume responsibility for building and maintaining record sets for commonly held electronic collections on behalf of the consortium. Today the program includes more than 220,000 shared records representing 765,000 individual library holdings. This has resulted in considerable savings in staff costs, processing costs, and metadata storage and suggests an evolving model for catalogers as managers, rather than as creators and curators, of metadata. This article discusses the evolution of this project, the development of staff trust necessary to let go of proprietary metadata, and the systems logic needed for implementation. The article closes with criteria for assessing the success of the program, including improvements in catalog display, throughput and timeliness, time savings, and elimination of duplicated maintenance activities.

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Submitted December 21, 2012; tentatively accepted April 5, 2013 pending modest revision; revision submitted April 22, 2013 and accepted for publication.

The authors wish to thank their colleagues Kathy Brown, Mona Couts, Wanda Gunther, Jacqueline Samples, Jill Sexton, Amy Turner, Margaretta Yarborough, and anonymous reviewers for commenting on drafts of this article.

In 2007 the four member institutions of the Triangle Research Libraries Network (TRLN) implemented a shared platform for discovery called Search TRLN (http://search.trln.org). Based on groundbreaking work performed by the North Carolina State University Libraries, TRLN used Oracle's Endeca Guided Search enterprise search application to support discovery and delivery services across the consortium's collections of more than 16 million volumes. Library patrons immediately took advantage of Search TRLN, and resource sharing within the consortium increased 70 percent in the first year after implementation. While member libraries immediately recognized the public service advantages of the new shared search platform, it took somewhat longer to recognize, and indeed to accept, the technical services advantages that might be gained through shared effort. The Search TRLN project exposed many cataloging processes, practices, and expenditures that were duplicated two, three, and even four times across the consortium's campuses and integrated library systems (ILSs). This article describes TRLN's Shared Records Program

(www.trln.org/endeca/shared-records.html) which leverages the Search TRLN system to share cataloging expertise and reduce duplicate cataloging activities within the consortium.

The Search TRLN Project

TRLN is a consortium of academic libraries in North Carolina. TRLN's history can be traced to the 1930s when the libraries at Duke University (Duke) and the University of North Carolina at Chapel Hill (UNC-Chapel Hill) began cooperative collection development activities and shared use of library collections. North Carolina State University (NCSU) entered into these cooperative agreements in 1955. In June 1980, the consortium formally adopted Triangle Research Libraries Network as its name. North Carolina Central University (NCCU) joined the consortium in 1995. The TRLN libraries currently collaborate in the areas of collection development, joint licensing of electronic resources, reciprocal borrowing and document delivery services, library automation, digital preservation, collaborative print retention, and various human resources initiatives.

Cooperative approaches to library automation have deep roots at TRLN. Beginning in 1976, the consortium provided early leadership in the development of shared online systems for maintaining bibliographic records and holdings for library collections. When the system known as the Bibliographic Information System (BIS) came online in 1985/1986, it was the earliest example of an online library catalog providing federated search across multiple databases of library holdings.[1] In 1993, the TRLN libraries ceased development of BIS and adopted vendor-provided ILSs and online catalogs.

Local innovation in this area resumed in 2006, when the NCSU Libraries implemented the first faceted library catalog, based on a commercial search engine provided by Endeca.[2] NCSU's next-generation catalog harvested MARC and item records from its local SirsiDynix ILS for indexing. No longer tethered to the data structures and indexes within the static framework of the ILS, the NCSU Libraries' Endeca catalog provided patrons with a much richer discovery experience than traditional library vendor-provided catalogs. NCSU's Endeca catalog inspired rapid development of "next generation catalogs" throughout the industry, forever changing patrons' expectations of library search.

The idea of federated searching across the holdings of all four TRLN collections was revisited in the Search TRLN project initiated in 2007. Led by a steering committee and several task groups, the project's goals were to provide Endeca-driven search capabilities across all of the consortium's holdings to facilitate discovery and delivery of library materials.[3] In this implementation, the Search TRLN system harvests MARC and item records from the ILSs of all four institutions and generates a single shared index. By March 2008, library patrons were searching the holdings of the entire consortium from a single web interface called Search TRLN. By 2009, TRLN's Endeca implementation supported locally scoped Endeca-based catalogs for all four institutions and indexed metadata in a wide variety of formats and schemas, including MARC, MARC/XML, Encoded Archival Description (EAD), Data Documentation Initiative (DDI/XML), and Dublin Core (DC) (see figure 1).

Union catalogs are typically created by merging bibliographic records for identical titles during metadata preparation and ingest. For instance, Coyle reported on the methods used to merge records during the implementation of the University of California Melvyl system; more recently, this practice has been used by the HathiTrust Digital Library.[4] The Search TRLN project takes a different approach. Instead of merging records during ingest, the Search TRLN system harvests and indexes the entire bibliographic database for each TRLN institution. Campus-specific Endeca catalogs can then scope searches to portions of the index corresponding to each institution's bibliographic database. Records that share common numeric identifiers such as OCLC numbers or Serials Solutions control numbers are merged "on-the-fly" in the consortium catalog, Search TRLN (see figure 2).

The decision to avoid merging records before indexing provided a straightforward method for individual member libraries to implement locally scoped catalogs and likely decreased implementation time for the entire project. This decision, however, laid bare the immense scale of the duplication of catalog records in the TRLN bibliographic databases. As an example, all four institutions independently maintained MARC records for US federal documents in electronic format. Essentially identical records were loaded into four separate ILS databases, sent out for authority processing by each library, then replicated in the Endeca indexes four times. This resulted in redundant and unnecessary staff effort, authority processing expenses, record storage costs, and processing costs. As the TRLN libraries implemented their Endeca-driven catalogs, it became clear that the Search TRLN platform provided an opportunity to share metadata and distribute the costs for its maintenance among the TRLN institutions.

Literature Review

Sharing bibliographic records has been a common interest among libraries for many years, beginning with the distribution of Library of Congress

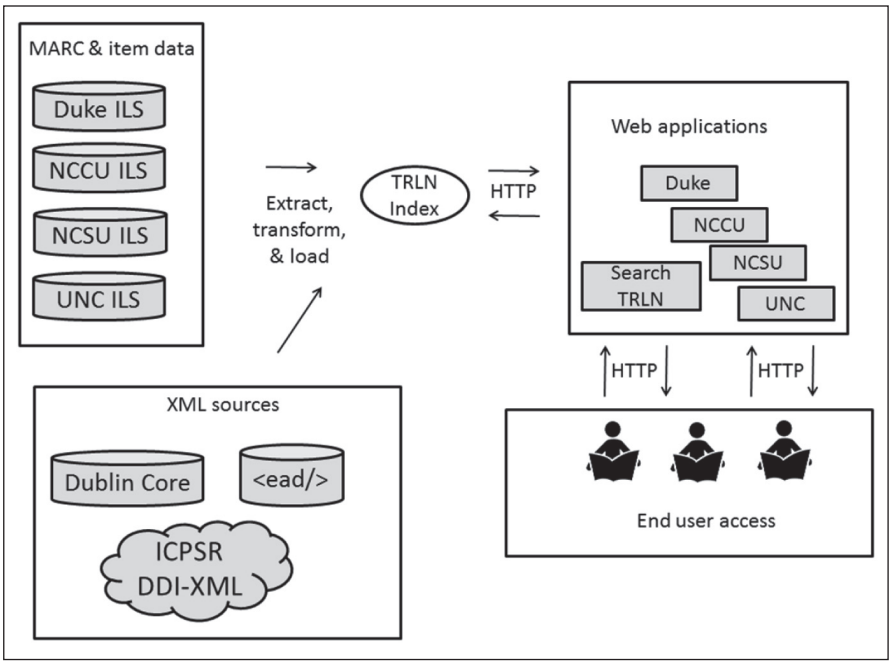

Figure 1. Search TRLN System Architecture

William Friday : power, purpose, and American higher education

Author:	Link, William A.	
Format:	Book	
Published:	Chapel Hill: University of North Carolina Press, c1995.	
Location:	Duke	Available
	NC Central	Available
	NC State	Available
	UNC Chapel Hill	Available

Figure 2. A Merged Print Record Display Rendered from Four Bibliographic Records in Search TRLN

(LC) catalog cards, but it was certainly accelerated by automation efforts that started with the introduction of the MARC record in 1968. OCLC, the Program for Cooperative Cataloging (PCC), its cooperative serials component (CONSER), and its Name and Subject Cooperative Programs (NACO and SACO) can all be viewed as institutionalized means for sharing the effort and cost of building our current bibliographic infrastructure. However, these still hew to the model of the central metadata store that libraries draw on to populate physically separate catalogs at the local library site. There is very little literature on libraries sharing metadata at the record level.

Shared/Cooperative Cataloging

Shared records projects take many forms throughout the library world. In the United States, consortium members most commonly determine model cataloging standards and practices (AACR2/RDA, MARC21, LCSH or MeSH subjects, successive or latest entry serials cataloging, separate or merged records describing multiple versions), but they continue to add and maintain institutional records within their own ILS. MARC records are harvested from each consortium member's ILS and merged in a separate centralized database, often maintained by the same ILS vendor individual consortium libraries use. This is the model described by Moeller at Prospector, the Colorado Unified Catalog, and is the model used by several other state consortia, most notably the University of California's California Digital Library (CDL), the Illinois Library Computer Systems Organization (ILCSO), and OhioLink.[5]

Consortia have other record-sharing models available, like TRLN, whose members do not share a common integrated library system. The Virtual Library of Virginia (VIVA) Project allowed individual libraries with disparate ILSs to voluntarily for host, maintain, and distribute particular collections of set records to consortium participants.[6] Unlike the Colorado, California, and Ohio model, which initially encompassed all formats, VIVA focused on electronic resources, which presumably required little local editing other than perhaps customizing the MARC 856 field to provide information for proxy server and display text.

The CDL also created a separate Shared Catalog Program (SCP) for managing e-resource metadata. In the SCP's centralized model, University of California-San Diego library creates and maintains metadata and contributes these records to Melvyl, which then further distributes those records to nine campuses. In a 2002 article, French, Culbertson, and Hsiung delineated several factors that lead to success in shared cataloging projects, including common descriptive

standards, high-quality metadata, timeliness, acceptance of records without local modification, use of holdings records for localized metadata, and good communication.[7]

Batch Loading Records and E-Resources Issues

Batch loading records for large collection sets is a strategy that libraries use to provide access to titles that are beyond the scale of current staffing levels. By relying on vendor metadata, libraries are able to make content discoverable much quicker than would be possible through manual copy cataloging procedures. Timeliness has its tradeoffs, however, including the potential for poor source metadata and the logistics for keeping current with vendor releases of record sets. Martin and Mundle discuss efforts to enhance the quality of vendor-supplied MARC metadata.[8] They ask readers to consider the staff cost of these efforts and urge libraries and consortia to work with vendors up front to enhance the initial quality of metadata. In his 2009 article on batch loading records for open-access books, Beall also discussed the poor quality of third-party supplied records but described how timeliness of access to 100,000 titles can outweigh poor metadata quality.[9]

Most recently, Mugridge and Edmunds surveyed large academic libraries to assess current practices and issues associated with batch loading MARC records.[10] Timeliness of record loads was an issue identified by a majority of the responding libraries. The authors also found that the eighteen libraries surveyed anticipated an increase in the importance of batch loading in the next five years, as long as the ILS continues to be identified as the database of record for a library's holdings. Further, they identified the use of discovery-layer software as a factor that may affect batch loading workflows.

Measuring the Effect of Record Sharing

Stalberg and Cronin reported on the 2009 work of the "Task Force on Cost/Value Assessment of Bibliographic Control."[11] The task group was charged by the Association for Library Collections and Technical Services (ALCTS) to "develop and articulate metrics for evaluating the cost and value of cataloging activities."[12] Following an extensive review of the cost/benefit literature of cataloging, they identified seven operational definitions of value including discovery success, use of collections, improvements in display, interoperability of library bibliographic metadata, support for Functional Requirements for Bibliographic Records (FRBR) user tasks, throughput and timeliness, and support for library administrative goals.[13]

Stalberg and Cronin proposed that "the extent to which data-creation processes facilitate timeliness in resource availability" can be used as a measure of value.[14] Furthermore, they argue that resources that are uncataloged are undiscoverable, and library patrons cannot use undiscoverable resources. These observations are consistent with studies indicating a negative correlation between cataloging backlogs and circulation of print materials.[15] Howarth, Moore, and Sze identified a major cause for cataloging backlogs to be a mismatch in the quantity of cataloging work to be done and the capacity to complete it.[16] They provided several suggestions to reduce backlogs including optimizing workflows, reallocating staff, using automated processes, and outsourcing cataloging tasks.

Writing in 2004, Fischer, Lugg, and Boese provided a ten-point checklist of business practices for reducing backlogs of print materials to release staff time for describing electronic resources.[17] Though Fischer and her colleagues focused on cataloging backlogs of print materials, their recommendations to "control the Expert Mentality," "automate and outsource where possible," and "trust vendor-provided metadata" remain relevant in the context of cataloging electronic resources. Fischer, Lugg, and Boese noted that the expert mentality results in overly complex and often-manual procedures to solve problems in cataloging.[18] Stalberg and Cronin echoed this sentiment when stating that "time spent on low-value activities (no matter which operational definition is used for 'value') is time not spent on high-value activities."[19]

Stalberg and Cronin isolated several costs associated with managing bibliographic metadata including staff salaries, tools and systems, and database maintenance, which are inherent to any evaluation of library work processes.[20] Efforts to increase cataloging efficiency and timeliness should therefore be judged by their effect on controlling if not reducing the costs of cataloging and releasing expert staff to work on more complex issues or deferred processing projects.

Making the Case for Record Sharing

Challenges with providing access to electronic resources provided the impetus to pursue this record sharing initiative at TRLN. In particular, the practice of displaying institution-specific information accompanying URLs for open access titles in Search TRLN was confusing and misleading to patrons. As these titles were freely available to all users, it struck TRLN's Technology Council as counterproductive to have these appear in the catalog with institutional identifying information, discouraging any but patrons of the loading agency from using the metadata.[21] This information included proxy-server URLs, restrictive notes (e.g., "Available to NCSU users only"), and inconsistent URLs. The Technology Council charged the Electronic

Resources Access Restrictions Task Group in 2009 to examine the display of e-resource links in Search TRLN.[22] While this group did make recommendations for clearer link displays, the Technology Council was particularly engaged with the Task Group's final recommendation for TRLN member libraries to consider sharing records, especially for large, commonly held collection set titles. With that in mind, the Shared Records Pilot Task Group was charged in 2010.[23]

The Shared Records Pilot Task Group began meeting just as TRLN was considering the purchase of additional storage space to accommodate growth in the number of records contained in the consortium catalog. The task group conducted an inventory of electronic resources collections held by institutions within the consortium and found two or more institutions subscribed to several large collections such as the Early American Imprints (Evans), Early English Books Online (EEBO), and Eighteenth Century Collections Online (ECCO). These records, not to mention the possibility of loading records from the Open Content Alliance (OCA), Google Books, and HathiTrust, when multiplied by just two or three institutional subscribers, could place a significant burden on shared storage space. Further, these shared sets represented unnecessarily duplicated staff time and expenses for purchase, record loads, and maintenance. The Search TRLN platform provided an opportunity to reduce this duplication and distribute metadata maintenance costs across the consortium.

The Shared Records Task Group developed a model, described below, to enable record sharing and recommended conducting a pilot project using record sets for three collections of electronic resources. Those collections were the NC LIVE Video collection of streaming videos from PBS, the Marcive "Documents Without Shelves" collection of online US federal documents, and the Interuniversity Consortium for Political and Social Research (ICPSR) dataset metadata. The Task Group's recommendations were accepted in 2010, and work soon began to make them a reality.

The Shared Records Model and Workflow

The Shared Records Pilot Task Group defined a Shared Records model including a mutually acceptable set of rules and expectations to guide the program. This was easily achieved within the task group, which was made up of technical service representatives from each campus along with a TRLN representative. It was a bit more difficult to achieve buy-in at the campus level, at least initially, for reasons that are discussed in detail below.

In the TRLN Shared Records Program, a single institution volunteers to assume responsibility for maintaining metadata for a given record set in a local ILS or other metadata repository. Those metadata records are harvested for indexing in the Search TRLN system and shared virtually with partner libraries through that system. As of November 2012, five record sets for electronic resources have been added to the Shared Records program: The NC LIVE Video collection, Marcive's Documents Without Shelves (DWS), ICSPR Codebooks (ICPSR), EEBO, and records for e-books from the Oxford University Press Scholarship Online (UPSO) platform.

The task group defined characteristics to determine whether a record set was eligible for the program. A worthy candidate for the Shared Records program would be a collection held by two or more member libraries for which the consortium has access to acceptable bibliographic records or updates available in appropriate metadata formats such as MARC, XML, .txt, or a fielded database or spreadsheet. First, record license rights for consortium use of metadata must be secured from the publisher or metadata provider load. The TRLN libraries gained access to the NC LIVE Video collection metadata through their membership in NC LIVE, North Carolina's statewide online library. Duke, NCSU, and UNC each licensed the EEBO metadata from Chadwyck-Healey independently. TRLN secured a consortium license to share the DWS records and the UPSO records were provided as part of TRLN subscription to the UPSO e-book collection. Second, descriptive cataloging standards for any set should be agreeable to all sharing institutions. These standards may be less than full AACR2 or RDA if agreed on by all participants. Finally, URLs in the metadata should be easily made institution-neutral through minor editing such as removing local proxy server prefixes and local use notes.

The size of a record set, possible savings in processing costs, and opportunities to standardize procedures and workflows were also criteria for determining eligibility. For instance, the EEBO record set was considered a viable candidate because of the large number of records involved (123,521) and the high expense of performing authority control at three institutions. Further, the use of non-unique control numbers in the EEBO source records had already generated numerous duplicate records in local catalogs, which were then carried over to Search TRLN.

The task group defined a set of responsibilities for institutions serving as record hosts. The host institution for a given record set is expected to take responsibility for maintenance of record sets in its ILS. In some cases, stewardship responsibilities have grown out of existing commitments. For instance, UNC-Chapel Hill, as the Regional Depository Library for North Carolina, was the logical candidate to maintain the consortium's DWS

Table 1. Shared Record Set Attributes

	NC LIVE Videos	MARCIVE's Documents Without Shelves	ICPSR	EEBO	UPSO E-Books
Format	MARC	MARC	DDI/XML	MARC	MARC
Shared by	4 institutions	4 institutions	3 institutions	3 institutions	4 institutions
Host institution	NCSU	UNC-Chapel Hill	ingest into Endeca directly from source	NCSU	Duke
Host institution provides authority control?	yes	yes	no	yes	yes
Set holdings at OCLC?	no	yes	no	no	no
E-resource access restrictions	IP-restricted	Open Access	Mixed open access and restricted content	IP-restricted	IP-restricted

subscription. In this case, TRLN served as purchasing agent and invoiced member libraries for their share of the costs. NCSU was an obvious choice for the NC LIVE and EEBO record sets since NCSU was already creating metadata for streaming videos on behalf of NC LIVE and had been maintaining the EEBO record set for many years. Duke recently took responsibility for maintaining the UPSO e-book record set. As described in more detail below, the ICPSR are not maintained locally at all; instead they are harvested directly from the ICPSR server and ingested into Endeca directly.

Host institutions also have responsibilities to maintain URLs for electronic resources and provide authority control of name and subject access points through local or vendor processes. Where appropriate the host institution should also set holdings at OCLC on behalf of the consortium. For instance, UNC-Chapel Hill uses an OCLC group profile and associated batch update services to set holdings at OCLC for the DWS records on behalf of all four institutions.

The task group also planned for a future possibility when the Shared Records Program may come to a close or when an individual TRLN institution might choose to withdraw and migrate to a new discovery platform. In these cases, host institutions are expected to be able to supply a current version of set records in an appropriate communication format (e.g., MARC) if needed by another member library for migration to a new discovery system.

Preparing Shared Records for Search TRLN

The TRLN Shared Records Task Group devised two models for managing shared metadata: a hosted model with a TRLN member library hosting records in their local ILS and a direct load model where metadata are harvested directly from an external source.

Hosted Model

In the hosted model, one TRLN institution assumes responsibility for hosting and maintaining metadata for a commonly held collection in their local ILS, and the host library shares the metadata with partner institutions through the Search TRLN indexes. Non-host institutions may also choose to maintain records for the set locally for reasons internal to that institution, but their records will be prevented from loading into Search TRLN through ingest filters in the metadata pipeline. In most cases, these record sets were removed from the local ILS of all but the responsible host library, although some federal document e-journals are still managed in serials knowledge bases.

Managing metadata in the hosted model includes three activities: local metadata preparation, indexing, and supporting display for library patrons. Some of these tasks are conducted by the host institution; others are managed by consortium staff.

Local Metadata Preparation

The first step involves loading records into the host library's ILS using typical batch loading processes. A good example is the Marcive Documents Without Shelves (DWS) record set acquired through a consortium license in 2011. UNC-Chapel Hill serves as the host institution for this collection. Each month, a UNC-Chapel Hill staff member downloads the monthly notification service file from the vendor and loads the records into their Innovative Millennium ILS. UNC-Chapel Hill takes responsibility for three maintenance tasks that were formerly handled by staff at each TRLN campus, including authority processing with an external vendor, setting holdings at OCLC for all four institutions using an OCLC group profile, and

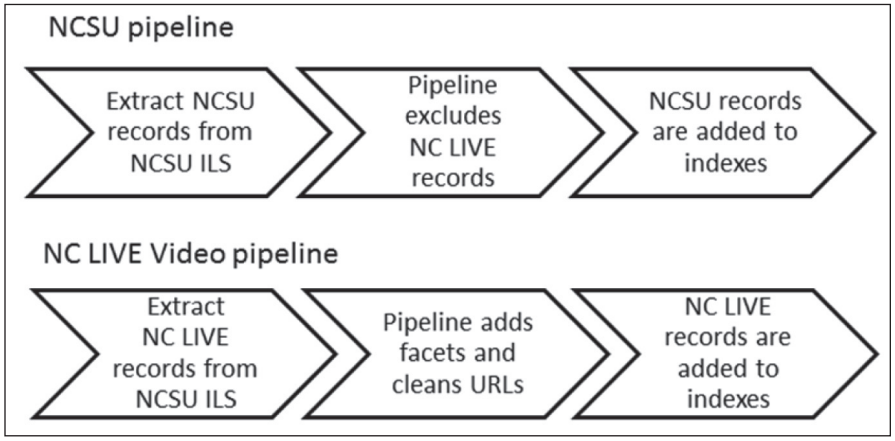

Figure 3. Pipelines for Preparing Shared Records for the Endeca Indexes

correcting URLs as needed.

Host institutions are responsible for adding identifying fields to each record in a given set so they can be isolated in the local ILS for global operations or extract. For instance, UNC-Chapel Hill adds a MARC 919 field including the text string "dwsgpo" to each of the GPO DWS records loaded into its ILS. UNC-Chapel Hill technical services staff can use this field to isolate these records for extract, for batch editing, and for archiving purposes. NCSU uses Sirsi-Dynix Symphony's "Item Cat2" to identify EEBO and shared open-access records. Similar procedures are used to identify the other hosted record sets managed in the Shared Records program.

As noted above, each institution uses automated processes to send metadata extracts of their MARC, EAD, and DC records to the Search TRLN system for indexing. Similar processes are used to provide sets of shared records with Search TRLN for indexing. Again drawing on the DWS record set as an example, UNC-Chapel Hill provides regular maintenance of this dataset including URL corrections, monthly DWS bibliographic updates, and authority processing. UNC-Chapel Hill then extracts all of the DWS MARC records and sends them to the Search TRLN servers for indexing on a weekly basis.

Indexing

At this point, processing is handed off to the Endeca applications, called pipelines, which prepare metadata for the indexes. The pipelines make several changes to each Shared Record set to support expected functionality in the user interfaces.

First, e-resource URLs must be made institution-neutral in the indexes. This typically involves removing a proxy server string from the URL as found in the extracted records. For instance, the record set for the NC LIVE Videos is hosted and maintained by NCSU and the record 856 field (Electronic Location and Access) for these records contains NCSU's proxy server string, http://proxying.lib.ncsu.edu. The NC LIVE Video pipeline removes the NCSU proxy prefix from each MARC 856 field and stores an institution-neutral URL for each record in the index. Proxy information is restored later for display, if it is appropriate for the set.

Second, several new facet values are added to the records to support needed functionality in the user interfaces. A Shared Records flag is set to "true" for these records so the user interfaces can detect Shared Records and render them properly for end users. Additional facet values are added for each sharing institution. For example, facet values for institution (Duke, NCCU, NCSU, and UNC-Chapel Hill) and format (Internet resource and streaming video) are added to each of the records in the NC LIVE Video record set. An Access facet is also used to indicate whether or not the user interfaces should render the records as open access or IP-restricted resources. Additional logic removes these records from the host institution's main pipeline, eliminating the possibility of creating duplicate records in the indexes.

Supporting Display for Library Patrons

The user interface code that drives Search TRLN and the local catalogs of each consortium member library needed minor modifications to display shared records. The most significant change was to restore the institution-specific URLs to support off-campus authentication for IP-restricted resources. UNC-Chapel Hill, Duke, and NCSU all use EZproxy (www.oclc.org/ezproxy). to provide remote access to IP-restricted resources. So in these cases, institution-specific proxy URLs are prepended to the institution-neutral URLs on-the-fly in the user interfaces. NCCU provides off-campus access to electronic resources through VPN access, so no additional processing is needed to render these URLs properly. The link text for IP-restricted (prepended proxy) and open access resources (no prepended proxy) is adjusted appropriately when records are rendered for patron use as shown in figures 4 and 5.

Direct Load Model

In the direct load model, metadata records are harvested from a vendor or third-party source and loaded directly into the Search TRLN indexes. This model includes three processes: harvesting metadata, indexing, and supporting display for library patrons. Metadata in DDI/XML format from

The Berlin airlift (electronic resource)			
Format:	Internet resource; Online Video		
Published:	(Boston): WGBH Educational Foundation; (Alexandria, VA) : Distributed by PBS Home Video, c2007.		
Location:	Duke	Available	Online (Duke only)
	NC Central	Available	Online (NCCU only)
	NC State	Available	Online (NCSU only)
	UNC Chapel Hill	Available	Online (UNC only)

Figure 4. Shared NC LIVE Record Treated as an IP-Restricted Resource in Search TRLN

100 GPO years, 1861-1961 (electronic resource) : a history of United States public printing	
Author:	United States, Government Printing Office
Format:	Internet resource
Published:	Washington, D.C. : U.S. Govt. Printing Office : For sale by the Supt. of Docs., U.S. G.P.O., 2010
Online Access:	Open Access resource

Figure 5. Shared MARCIVE DWS Record Treated as an Open Access Resource in Search TRLN

ICPSR fall into this category and provide examples for discussion.

Harvesting Metadata

ICPSR generates metadata about its datasets using the Data Documentation Initiative (DDI) metadata specification (www.ddialiance.org) and makes it available on the ICPSR website in XML format. ICPSR currently uses the DDI Codebook 2.1 schema and Document Type Definition (DTD) to structure these documents. Once each week the entirety of the ICPSR XML corpus is downloaded to a TRLN server and prepared for indexing.

Indexing

As in the hosted-record model, a specific Endeca pipeline prepares the DDI/XML for indexing. The first step transforms the codebooks into indexable documents. TRLN adapted an ICPSR-provided Extensible Stylesheet Language (XSL) stylesheet to transform each DDI/XML codebook into a format that could be indexed by Endeca.[24] The remainder of the pipeline adds facets appropriate for these records including the Duke, UNC-Chapel Hill, and NCSU institutional facets and the Statistical Dataset and Internet Resource format facets.

Supporting Display for Library Patrons

As with the hosted-record model, records loaded in the direct-load model also need institution-specific proxy URLs. This was not necessary for the ICPSR metadata because access control for these metadata is managed at the ICPSR website through individual logins associated with licensing institutions.

Benefits to the Direct Load Model

Before implementing the Shared Records Program, Duke, UNC-Chapel Hill, and NCSU independently loaded and maintained MARC records prepared annually by ICPSR. Once per year catalogers at each institution updated the ICPSR MARC records in each respective ILS. The ICPSR portion of the Shared Records Project generated several benefits. The first benefit is timeliness now that the ICPSR metadata are updated in the Search TRLN indexes on a weekly basis. Second, TRLN was able to access the entire codebook for each dataset. This allowed TRLN to index a greater proportion of the metadata about each dataset than could be done when relying on the MARC records. Third, all of the processing for the direct load model is automated and monitored by consortium staff. This allowed Duke, NCSU, and UNC-Chapel Hill to eliminate all ICPSR dataset records from their ILSs and eliminate three formerly duplicated workflows, allowing cataloging staff to address other projects.

Obstacles Overcome

The technical and workflow issues

Ithaka S+R Faculty Survey 2009: Key Strategic Insights for Libraries, Publishers, and Societies			
Format:	Internet resource; Statistical Dataset		
Published:	Ann Arbor, MI: Inter-university Consortium for Political and Social Research 2011		
Location:	Duke	Available	Online (Duke only)
	NC State	Available	Online (NCSU only)
	UNC Chapel Hill	Available	Online (UNC only)

Figure 6. A Record Derived from an ICPSR DDI/XML Codebook as Rendered in Search TRLN

behind the TRLN Shared Records model necessitated careful planning and management across the consortium. At the Duke University Libraries, a shift in staff perspectives was necessary for the initiative to succeed. Cataloging staff had to move from crafting metadata to managing it, and to achieve this transition had to trust external sources of metadata. Paradoxically, this meant giving up local control as the need to expose metadata to users on a large scale increased. New methods for managing e-resource holdings and the adoption of the Endeca-based catalog helped change perspectives and facilitated a wholesale adoption of the shared record model.

New Methods for Managing E-Resources

Before 2010, the Duke University Libraries (DUL) managed e-resource holdings in two different systems, the ILS and a vendor-provided knowledge base. In late 2010, e-resource management functions were largely consolidated into a single knowledge base provided by a new vendor. This brought about a deepening comfort with managing resources and their associated bibliographic and administrative metadata outside of the ILS. The scale of electronic resource holdings made management of these resources through the ILS impossible. At the point of migration to the current knowledge base, the total number of unique electronic resources managed was 252,000. By the end of the fiscal year the following summer, 544,800 unique titles were being tracked in the knowledge base.[25] By November 2012, 1,059,795 unique titles were being tracked in the knowledge base. In addition to tracking resources, the knowledge base serves as a repository for details about the terms of access and workflow. Even discovery of these resources became mediated through the knowledge base, with the knowledge base provider supplying MARC records for tracked titles. Timeliness of access was also a feature that gave the knowledge base an advantage over the ILS. On the back-end, as soon as the platform and its associated titles could be tracked, metadata about those resources became available for reporting and documenting workflow decisions. More importantly, the gap between library access to a title and its discovery by the public shrank to twenty-four hours for the A–Z list compared to up to two weeks for the catalog. Thus the ILS ceased to be the database of record for electronic resource holdings, and the stage was set for managing discovery of resources via other means.

Declining Importance of Vendor-Provided Online Catalog

At the same time that a proliferation of often-transient electronic resources changed the staff's perspective toward the back-end ILS as a collection management tool, advances in discovery interfaces led to abandoning of the traditional ILS-based OPAC as Duke's primary discovery tool. By 2010, Endeca stood firmly as the library's catalog. Two years later, DUL implemented a web-scale discovery tool. This meant that metadata sources were no longer confined to MARC records in the ILS, and that catalogers had to develop new, large-scale understandings of metadata and how it fuels discovery.

Perceiving Benefits

Changing perspectives and reconceptualization had created a willingness to test the Shared Record model with the Marcive DWS portion of the project. Actually seeing the model work in practice, while addressing known metadata and workflow needs, was critical for wholesale adoption. Over the course of various staffing and organizational changes at DUL, the workflow for the loading of MARC records for electronic government documents no longer followed Duke's standards and practices for other electronic resources. An ILS migration in 2004 further added to the issues with this workflow, and staff had a metadata cleanup project to implement along with workflow changes. The workflow changes were easier to implement, though they still required staff time and maintenance. Untangling the metadata issues and fitting cleanup among other priorities was more complex. The proposal to share the DWS records between all TRLN libraries came at exactly the right time—just as staff members were working to shift

Table 2. Shared Records Efficiencies

Collection	Titles	Held by	Local Cataloging Workflows Eliminated or Avoided	Record Savings
MARCIVE's Documents Without Shelves	87,143	4 institutions	3	261,429
NC LIVE Videos	428	4 institutions	3	1,284
ICPSR	8,471	3 institutions	3*	25,413**
EEBO	123,521	3 institutions	2	247,042
OUP E-books	1,568	4 institutions	3	4,704
Total	221,131	--	14	539,872

* Moving to the direct load model for ICPSR allowed Duke, NCSU, and UNC-Chapel Hill to eliminate their local cataloging workflows for this collection.

** Authority processing is not conducted for the ICPSR records.

priorities and address the outstanding metadata issues. To confirm the number of records that needed to be excluded through the ingest filters in the metadata pipeline, staff were able to prioritize this metadata cleanup project, gain a deeper understanding of the issues involved, and plan for making the metadata uniform with other metadata for electronic resources. The time saved from ongoing maintenance of DWS record loads allows staff to focus on metadata cleanup and refining the workflow for managing discovery of all US documents. The way in which the shared DWS records addressed such an immediate need hastened the transformation from a willingness to try the shared record model to adoption of it and taking advantage of all its benefits.

A later project to share EEBO records further underscored how beneficial the Shared Records model is to timeliness of access and discovery. The proposal to share EEBO records came at a time when past record loading workflows were transitioning across departments, and the budget for automated authority control was being examined and restructured. Once again, Duke received the benefits of a shared records project supporting timely discovery that also allowed for a restructuring of workflows and budgets. By the time the EEBO project was complete, shared records became an ingrained part of workflow planning for facilitating timely discovery of electronic resources. The most recent shared records project, which facilitates discovery of consortium-held Oxford University Press/University Press Scholarship Online eBooks, is managed at DUL and provides a concrete example in which changes in perspective transformed local perceptions of the ILS and management of access and discovery.

Effect

As of September 2012, over 220,000 titles in six collections were managed in the TRLN Shared Records program. The effect of the program can be measured in terms of throughput and timeliness (making metadata discoverable faster), saving time and reallocating effort by eliminating duplicate technical services workflows, and financial benefits through reduced licensing costs and the sharing of authority control costs.

Throughput and Timeliness

As previously noted, Stalberg and Cronin identify "the extent to which data-creation processes facilitate timeliness in resource availability" as a measure of metadata value.[26] Since the inception of the Shared Records project, TRLN has observed improvements in metadata timeliness for several collections. The ICPSR and OUP E-book projects provide good examples. The ICPSR metadata are currently updated in our indexes weekly. Before implementation, these records were updated once per year. The schedule for metadata processing of OUP e-books at DUL is driven by objectives of the broader e-book pilot, decreasing the time between e-resource availability and discoverability. The automation of all metadata harvesting and indexing processes also improves timeliness of metadata availability.

The TRLN Shared Records project has delivered efficiencies in throughput as well. That a single institution can take responsibility for managing metadata on behalf of two or three partner libraries delivers efficiencies immediately through the elimination of workflows. As seen in table 2, fourteen discrete local cataloging workflows have been eliminated or avoided in the TRLN libraries.

Saving Time and Reallocating Effort

The elimination of duplicate workflows has created time and energy at each institution for other projects and new initiatives. For instance, before

the implementation of the Shared Records program, cataloging staff at NCSU, Duke, and NCCU spent time maintaining URLs in bibliographic records for government documents. UNC-Chapel Hill, as regional depository and host institution for the TRLN DWS collection, has taken responsibility for these activities, freeing up staff at the other institutions for different activities. Duke, for instance, reallocated technical services staff to work on deferred metadata management activities related to government documents.

Sharing Costs

The TRLN Shared Records program allows the TRLN libraries to share the costs of licensing records and authority processing. For instance, a consortium license for DWS reduced NCSU's annual Marcive record subscription costs by $650. Centralized processing yields other savings as well. Before implementing the Shared Records Program, the consortium's libraries paid Marcive to "set holdings" at OCLC for DWS titles. This process has been centralized and UNC-Chapel Hill staff use OCLC batch processes and a group profile to set holdings, virtually eliminating this expense. As of September 2012, 221,131 records were in the Shared Records program, which removed 514,459 records from authority control at the four institutions eliminating associated processing costs.

Conclusion

The era of the library catalog as a motley collection of discrete and static records reflecting decisions made at particular points in time and under differing sets of rules and local practices is rapidly drawing to a close. The technological hurdles began falling when LC automated the production of its card sets in the 1960s and continues to this day with the advent of simple but powerful personal metadata manipulation tools like MarcEdit and MARC Report, commercial MARC record notification services, serial and e-resource knowledge bases, and the promise of linked metadata.

In the last ten years, the pace of this change has finally reached the social, political, and personal spheres, as cataloger retirements and the economics of technical services operations have run head-on into other, even more powerful, movements affecting the bibliographic universe. Principal among these has been the merging of traditional reference discovery tools (indexes, bibliographies, citation analysis) with full-text databases to create a compelling competitor to the more mundane library catalog. Electronic resource management, with its huge package deals, complicated license agreements, knowledge bases, and link monitoring has necessitated a similar deflection of library attention away from the catalog and local ILS toward outsourced bibliographic record creation and maintenance. Finally, the renaissance of special collections has led to additional competition for metadata expertise and discovery layer development. It is not too much of an exaggeration to say that experiments to bring together the new reference tools, electronic and digital resources, and archival finding aids with the catalog have consumed much of the library world's energy over the last decade. This has forced libraries to invest less toward institutionally specific catalog records and more toward customized information discovery tools.

These broad movements in library stewardship have also changed the expectations of library management toward technical services, and particularly cataloging personnel. The ideal cataloger is no longer the person with the deepest knowledge of AACR2, RDA, or LCSH, but rather the person who is most adept at batch metadata manipulation, vendor contract management, liaison with library or campus IT, and training and motivation of support staff. She is also expected to be on the lookout for synergies with interested third parties and anything else that could potentially reduce institutional processing costs and efforts.

The Shared Records Program has allowed the TRLN libraries to build experience and expertise to address these concerns. TRLN libraries are now putting their trust in metadata that is both vendor-generated and maintained by a single partner library. In the process, the consortium has developed additional expertise in batch metadata manipulation. Removing manual tasks as much as possible from Shared Records processing procedures has decreased the time to disseminate metadata to discovery applications. The elimination of duplicative metadata workflows at member libraries has released cataloging staff to work on more pressing metadata maintenance efforts and has reduced authority processing costs.

Several factors were essential to the program's success. The shared technical infrastructure provided by the Search TRLN system delivered a platform that enabled record sharing in this way. Deep expertise at member libraries in the areas of batch processing of metadata was critical to the project's success. TRLN's formal council and committee structures provided a vehicle for gaining support for a pilot project and eventually a framework for implementing the program. The Electronic Resources Access and Shared Records Pilot task groups received clear charges with well-defined goals, objectives, and timelines for completion ensuring that the project would stay on track and in scope. Broad representation on these task groups also ensured that appropriate input from throughout the consortium would be gathered and that the program would have wide support upon implementation. The most important factor, however, is the presence of a deep

trust between the libraries of TRLN built through decades of collaboration. Similar conditions undoubtedly exist in other small library consortia to replicate this model, a relatively simple extension of the resource-sharing model that has guided library technical services for decades.

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Book Reviews

Norm Medeiros

Do We Still Need Peer Review? An Argument for Change. By Thomas H. P. Gould. Lanham, MD: Scarecrow, 2013. 175 p. $60 paperback (ISBN: 978-0-8108-8574-5).

Despite the implication of the title, Thomas Gould states in the preface that indeed he "values peer review" (xi). He argues that it is no longer enough for those in academia to complain that the current peer review system is broken without offering suggestions for change. Instead, the time has come to examine from where we have come and to make a plan for meaningful change.

Many may understand the peer review process, but Gould takes the opportunity to outline the basic steps, from the research process through editorial decision to accept or reject a manuscript based on reviewer evaluation. In this opening chapter, Gould defines "peer," gives a brief history of peer review, offers pros and cons of the peer review process, and briefly discusses why maintaining the status quo is not a viable option.

The concept of peer review has been around longer than many people would imagine. Gould's overview of the history of peer review begins well before the invention of Gutenberg's printing press and extends into the present. Before the invention of the printing press, the expensive and labor-intensive process of hand copying texts meant that very few of the small number of literate individuals had access to these works. The review process, however, was still occurring. By extending the definition of "peer" to "one's betters" (13), Gould demonstrates the role early kings and church leaders had in reviewing ideas. Such "postreview," occurring after a work was made public (24), was used to "protect" people from dangerous ideas or discourage freethinkers.

The next chapter covers the period 1600–1950, at which time a review process began to more firmly develop in academia. Gould writes that "what arose in the seventeenth century was a new form of publishing that focused on smaller tomes, a multitude of authors, and a very real need for some system of editorship" (45), i.e., the academic journal and editor. Academia was changing as well. Ideas were easier to share, so more people were exposed to them. During this time, the number of universities and teachers increased. This chapter concludes with a discussion of peer review as it existed in the 1950s. By this time, peer review had transitioned from a process of postreview to a process of prior restraint in which ideas could be suppressed before they were published.

In chapter 4, Gould introduces readers to the anonymous, double-blind peer review process. He offers examples of the flaws of a process in which "what was once good is now not so good" (57). Utilizing previous research on the pitfalls of the anonymous, double-blind peer review process, Gould explores gender bias; a perceived "caste" system of published research; how writing style may affect the acceptance of an article; and cases in which reviewers or editors purposely stall a paper because it might be in competition with their own publishing efforts. Despite this, Gould still believes the review process is a viable method for determining what research is appropriate to publish. In chapter 5 he discusses how the Internet, social media tools, and online publishing affect perceptions of what is a worthy medium for publication. Digital and open access (OA) publishing are common on many campuses, and it is fitting that he includes a discussion of these as part of an examination of the relevancy of peer review.

In the final chapters of the book, Gould presents various options for improving the peer review process. Chapter 6 opens by sharing "commandments" for improving the review process, which are taken in part from the article, "Five Commandments for APA" by Nora Newcombe.[1] Gould writes that while the commandments "may seem naive" (91), they offer a foundation that could be used when discussing options for reforming the peer review process. This chapter then focuses on many of the proposed solutions.

Gould presents several potential roles for librarians in improving peer review. Since librarians are in a unique position to understand the importance of expertly done research, he proposes a library-as-partner model (120–21). In this model, librarians go to faculty researchers to teach or re-teach them about the library and the resources that are available (119). While his view of the tension that exists between librarians and teaching faculty seems slightly generalized, Gould does see value in the role that librarians play in the research process. Other options that he presents for librarians and library involvement are as members of editorial teams and as leaders for OA journal publishing initiatives at universities.

Do We Still Need Peer Review? is a compact book with more historical information than one would expect. The historical discussion not only adds perspective to the problem at hand, but is one of the most interesting aspects of the work. True to his word,

Gould, rather than advocating for the abolishment of peer review, offers steps that can be taken to improve this important part of academia. Other authors have tackled this topic, and Gould cites many of them throughout his text and with references at the end of each chapter. This book would be useful for institutions discussing or reevaluating the peer review process, as well as those studying open access journals and online publishing.—*Lynda Aldana (laldana@umbc.edu), University of Maryland, Baltimore County, Baltimore, Maryland*

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The Transformed Library: E-books, Expertise, and Evolution. By Jeannette Woodward. Chicago: ALA, 2013. 130 p. $55 paperback (ISBN: 978-0-8389-1164-8).

From the title one may surmise that Jeanette Woodward's book focuses on e-books in libraries, but *The Transformed Library* is actually a timely and accurate assessment of the state of libraries in today's world relative to technology and economy. Woodward offers insightful advice to librarians on how to survive and thrive during these times of rapid technological transformation and dramatic budget cuts.

Woodward organizes this slim volume into nine chapters and includes an introduction, conclusion, and index. The first chapter, "Gutenberg Meets Kindle: The Arrival of Digital Books," focuses on e-book use in libraries and provides a brief history of the shift from the printed to digital word. Chapter 2, "Libraries vs. E-Publishers: The Library's Point of View," discusses the difficult relationship that currently exists between publishers and libraries that circulate e-books; the author also addresses related issues involving e-media in this chapter. Chapter 3, "The Age of High Anxiety: Threats That Fuel Library Nightmares," examines the effect of outsourcing on library constituents, specifically when local governments decide to outsource public libraries to save money. Chapter 4, "The Library in Cyberspace," describes how libraries have fallen behind in communication and social networking technologies, and provides strategies for rectifying this situation. In chapter 5, "Will the Coffee Shop Save Us? The Library as Place," explores how libraries can fulfill people's need for a public place. Woodward contends that successful libraries are those that develop space from the patron's viewpoint, and when cozy and warm spatial designs delight patrons and invite them to stay. In chapter 6, "Library Careers That Won't Go Away," Woodward advises librarians on how to develop marketable skills for an uncertain future. She also briefly advises library science programs on how to graduate marketable students who possess the requisite skill set for twenty-first century information professionals. The next three chapters focus on survival strategies for different types of libraries: public libraries (chapter 7), academic libraries (chapter 8), and school libraries (chapter 9). Within these chapters, Woodward depicts different scenarios on how libraries could fail or succeed depending on how they adapt to the changing requirements of the communities they serve.

The main points Woodward repeats throughout her book are that libraries must not only evolve technologically to stay current with user needs, but they must also evolve spatially and programmatically. Libraries must stay customer-focused to maintain relevancy and garner community support, especially in these difficult economic times. These survival strategies also include workflow and daily task adjustments, and expanding hours of service. Such flexibility and customer-centric policies will result in patrons viewing their libraries as essential, and fighting to keep them financed.

Woodward's viewpoint is not apocalyptic, but at times she is realistically grim, particularly in cases where libraries fail to be customer-oriented. She stresses that librarians must market themselves and their services, as constituents and financial decision-makers will not automatically recognize the value of information professionals. Librarians must reach out and educate said decision makers while garnering the support of those who benefit from their services. Most importantly, Woodward stresses that as long as libraries are receptive to change and evolve with their communities, they will ultimately survive.

In the introduction Woodward states that she is writing for other librarians. However, I would highly recommend this read to first-year library science (LIS) students as her book provides an excellent overview and summary of where libraries have been, their current state of affairs, and their future outlook. Woodward offers a good framework for such students beginning their studies; she gives them an accurate context within which to approach topics as they learn about the field and the future roles that information professionals will fulfill. Woodward's book would give LIS students a solid basis from which to contemplate the various types of communities they may be best suited to serve. Her book could also help students develop strategies for success in the profession. —*Shannon Fox (sfox@austincollege.edu), Austin College, Sherman, Texas*

Library Collection Development for Professional Programs: Trends and Best Practices. Edited by Sara Holder. McGill University: IGI Global, 2013. 478 p. $175 hardcover (ISBN: 978-1-4666-1897-8).

Librarians are inherently disadvantaged in collecting for professional programs as they often approach this responsibility as an outsider. Standard

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Librarians are inherently disadvantaged in collecting for professional programs as they often approach this responsibility as an outsider. Standard

selection tools (*Resources for College Libraries*, *Books in Print*, *Choice*, *Ulrich's*) largely ignore materials that support these programs, such as technical reports, digital image databases, government documents, sacred literature, conference proceedings, theses and dissertations, and textbooks. Furthermore, library materials for professional programs include both core titles in the discipline as well as very current materials for certification or testing requirements. Recent collection management texts cover many of the issues contained herein (conspectus method, deselection, collection development policies), but tend to be light on selection tools for the librarian charged with building in these areas. *Acquisitions Librarian* (now *Journal of Electronic Resources Librarianship*) published a series of subject-specific collection development articles in 2004, which were incorporated into the monograph, *Selecting Materials for Library Collections* (Haworth Information, 2004). Although the theoretical content holds and selection tools are still used, some descriptions in this book are outdated. The chapter on nursing refers to the Brandon-Hill lists and E-streams for nursing, neither of which is being maintained. The ALCTS Sudden Selector's guides are limited in subject coverage, to date addressing biology, chemistry, business, and communications. *Library Collection Development for Professional Programs*, therefore, is a welcome guide for students of library and information science, new librarians, or those with new selection responsibilities for professional programs.

The disciplines profiled include both undergraduate and postgraduate programs: business, design, teacher education, engineering, nursing and allied health, law, library science, theology, and veterinary medicine. The chapter on bioinformatics outlines the process of developing collection guidelines for an evolving discipline, and can be applied to any emerging area of study. Interdisciplinary studies is included, as these programs have proliferated in recent years and are now "career-oriented and . . . structured similarly to professional programs" (164).

A book of contributed chapters can be uneven in content and suffer from repetition, especially in discussion of the common themes of budgets, marketing, deselection, and collection development policies. While there is some necessary overlap, these fundamental topics are covered in various depths and address needs specific to the discipline. Several touch on the importance of deselection as part of collection development, and the text also includes two chapters of case studies on weeding projects that are applicable to any discipline. The meat of each chapter, however, are the selection tools. Most chapters provide lists of core books, journals, and databases in the discipline, as well as resources for identifying additional titles from accrediting agencies, professional societies, discipline-specific publishers, review services, and electronic discussion lists. Some chapter authors provide lists of relevant Library of Congress call number ranges to assist collectors in identifying related materials in cross-disciplinary topics. Free and open access sources are included.

All chapters are written by practicing librarians, and chapters progress from the broad to the specific. With the premise that "good collection management is transferrable from position to position" (xviii), chapter 1 is "Five Steps to Efficient, Economical Collection Development"; the following chapter covers approval plans with content provided by Ingram. The final eight chapters of the book focus on case studies, projects, and surveys from university libraries. The book includes "bird's eye views" of several disciplines and collecting for professional subfields. Each chapter is in article format, beginning with an abstract, introduction, and background of the discipline, and concluding with future directions in acquisitions for the discipline, a conclusion, and references. Some chapters also include further reading, which can help librarians build their selection acumen as well as provide reference sources relevant to the discipline.

Readers will find some content of limited value. "Developing a Juvenile Literature Collection in an Academic Library," for example, recommends the Amazon and Barnes & Noble websites as two free selection sites, with appropriate cautions regarding reviews. While perhaps intending to allay concerns over using these popular sites, a short list of the salient children's literature websites would have been more useful; there are many such sites that vary in usability, mission, and content, and readers would benefit from the recommendation of an experienced user. The nursing chapter devotes a section to the definition of a collection development policy. It also identifies basic collection development texts, but unfortunately excludes current editions.

Some editing decisions detract from the content. Each chapter includes a list of key terms and definitions, which is helpful but quirky, as these short lists include both general library terms and terms relevant to the professional program covered. The glossary for allied health programs, for example, includes H1N1, point of care tool, MSRA, Carnegie Classification, and embargo. While the definitions are helpful, it would make more sense to have a single compiled glossary at the back of the text, as is done with the references from each chapter. Additionally, the index is inconsistent and incomplete; some, but not all, of the terms included in chapter glossaries are indexed. For instance, gifts are mentioned in three chapters (one at length), but this subject is not indexed as gifts, donations, or material donations. Some terms are incompletely indexed: patron-driven acquisitions

(PDA) has several index entries, but inexplicably omits the PDA discussion in chapter 9. Another weakness concerns the graphics. Many screenshots are difficult to read, containing blurred or small print, which renders them nearly illegible.

These shortcomings make the text slightly more difficult to use, but do not make it any less valuable. Content is current as evidenced by chapter citations and relatively recent publishing events (EBSCO's purchase of H.W. Wilson, for example). Aspects of technical subjects are clearly explained and assume no prior knowledge of the discipline. Importantly, librarians with selection responsibilities for other academic and professional programs will be able to extrapolate much of the information to their own areas. This is a welcome and much-needed text for academic librarians with collection responsibilities for professional programs.—*Cathy Goodwin (cgoodwin@coastal.edu), Coastal Carolina University, Conway, South Carolina*

The Librarian's Legal Companion for Licensing Information Resources and Services. By Thomas A. Lipinski. Chicago: Neal-Schuman, 2013. 734 p. $130 paper (ISBN: 978-1-55570-610-4). The Legal Advisor for Libraries, Educators, & Information Professionals.

When the electronic publishing revolution launched with CD-ROM-based abstract and index services (A&I), the license substituted access for ownership and complicated library acquisitions forevermore. With the contract, libraries lost doctrines of fair use and first-sale that were so ingrained into the business of libraries as to be taken wholly for granted. Three decades after subscription budgets were gobbled up by "big deal" financials, does the library world need a 700-page print book on the subject of licensing information resources? Is there an acquisitions or collection development librarian left who is innocent of the complexities of these licenses, which tend at once to make available 24/7 more and more of the world's fund of intellectual achievement, but at staggering costs and restrictive conditions?

Tomas Lipinski surely does not intend his hefty monograph to be read through over serial sittings, by either the innocent or jaded licensing librarian. As director of the school of library and information service at Kent State University, he joins Tracy Mitrano (Cornell University) and Kenneth Crews (Columbia University) as one of the great legal authorities in American librarianship. Lipinski's purpose is to provide a sourcebook for licensing librarians to consult as they seek the second opinion of a serious intellectual property (IP) lawyer. His work's theme is reducible to "contract trumps copyright law"; he seemingly cannot repeat this enough, but given the widely and wildly variant contexts in which he makes this point, the admonition does not come off as hectoring.

The Librarian's Legal Companion for Licensing Information Resources and Services has much to recommend. For starters, the title signals Lipinski's acceptance that the line between databases and software is often arbitrary. Indeed, he makes clear that software has always been licensed, with licensing and copyright existing side-by-side in tension and contradiction from the first stirrings of the information technology ecosystem. For every named mention of a database platform, e.g., Cengage, there is another to a software colossus like Microsoft. As if to underscore the difficulty in unraveling software's inevitable entanglement of content, he introduces a third element, hardware in the form of the e-reader. The Kindle is sold, and under the doctrine of first-sale, libraries may lend them. But Amazon's software is licensed, restrictively. Books for the Kindle are nontransferrable. Can libraries lend Kindles even if they have not set up a complicated arrangement with OverDrive? Lipinski himself is unsure, but anyone who reads his analysis will find it less than exhaustive and illuminating.

Lipinski ventures beyond the right to distribute gadgetry, boldly venturing into the property regime of the web itself. He dissects the multiplicity of terms of use (TOU) and end user license agreements (EULA) proliferating throughout the web generally. Their language binds individuals accessing web-enabled services through any library or institution of higher education, but few patrons read these agreements and fewer understand them. Fortunately, as Lipinski points out, courts have sometimes, perhaps with surprising frequency, sided with plaintiffs claiming "unconscionability" (148), i.e., bullying by contract. His chapter on the open source movement and the development of the Creative Commons and General Public (GNU) licenses could stand alone as an essay. This is not to suggest there is any false advertising by Lipinski or his publisher, the American Library Association; this is a legal guide, after all. But the few librarians who will approach this as narrative are likely to make it to the end only if they possess more than a layperson's grasp of US copyright statute and theory. And even those with that grasp will mostly give up before the end. Three cases in point: first, there is an entire chapter on the formal mechanisms by which a contract is officially executed; anyone who has tried to negotiate a contract hopes to get to that end stage, but by that point all the hard work has been done; the official sealing of the deal is generally straightforward. Second, he places far too much emphasis on arbitration clauses; while compulsory arbitration is a major matter in labor law and product liability, I know of no instance in which a library was forced

Gould, rather than advocating for the abolishment of peer review, offers steps that can be taken to improve this important part of academia. Other authors have tackled this topic, and Gould cites many of them throughout his text and with references at the end of each chapter. This book would be useful for institutions discussing or reevaluating the peer review process, as well as those studying open access journals and online publishing.—*Lynda Aldana (laldana@umbc.edu), University of Maryland, Baltimore County, Baltimore, Maryland*

Reference

1. Nora S. Newcombe, "Five Commandments for APA," *American Psychologist* 57, no. 3 (2002): 202–5.

The Transformed Library: E-books, Expertise, and Evolution. By Jeannette Woodward. Chicago: ALA, 2013. 130 p. $55 paperback (ISBN: 978-0-8389-1164-8).

From the title one may surmise that Jeanette Woodward's book focuses on e-books in libraries, but *The Transformed Library* is actually a timely and accurate assessment of the state of libraries in today's world relative to technology and economy. Woodward offers insightful advice to librarians on how to survive and thrive during these times of rapid technological transformation and dramatic budget cuts.

Woodward organizes this slim volume into nine chapters and includes an introduction, conclusion, and index. The first chapter, "Gutenberg Meets Kindle: The Arrival of Digital Books," focuses on e-book use in libraries and provides a brief history of the shift from the printed to digital word. Chapter 2, "Libraries vs. E-Publishers: The Library's Point of View," discusses the difficult relationship that currently exists between publishers and libraries that circulate e-books; the author also addresses related issues involving e-media in this chapter. Chapter 3, "The Age of High Anxiety: Threats That Fuel Library Nightmares," examines the effect of outsourcing on library constituents, specifically when local governments decide to outsource public libraries to save money. Chapter 4, "The Library in Cyberspace," describes how libraries have fallen behind in communication and social networking technologies, and provides strategies for rectifying this situation. In chapter 5, "Will the Coffee Shop Save Us? The Library as Place," explores how libraries can fulfill people's need for a public place. Woodward contends that successful libraries are those that develop space from the patron's viewpoint, and when cozy and warm spatial designs delight patrons and invite them to stay. In chapter 6, "Library Careers That Won't Go Away," Woodward advises librarians on how to develop marketable skills for an uncertain future. She also briefly advises library science programs on how to graduate marketable students who possess the requisite skill set for twenty-first century information professionals. The next three chapters focus on survival strategies for different types of libraries: public libraries (chapter 7), academic libraries (chapter 8), and school libraries (chapter 9). Within these chapters, Woodward depicts different scenarios on how libraries could fail or succeed depending on how they adapt to the changing requirements of the communities they serve.

The main points Woodward repeats throughout her book are that libraries must not only evolve technologically to stay current with user needs, but they must also evolve spatially and programmatically. Libraries must stay customer-focused to maintain relevancy and garner community support, especially in these difficult economic times. These survival strategies also include workflow and daily task adjustments, and expanding hours of service. Such flexibility and customer-centric policies will result in patrons viewing their libraries as essential, and fighting to keep them financed.

Woodward's viewpoint is not apocalyptic, but at times she is realistically grim, particularly in cases where libraries fail to be customer-oriented. She stresses that librarians must market themselves and their services, as constituents and financial decision-makers will not automatically recognize the value of information professionals. Librarians must reach out and educate said decision makers while garnering the support of those who benefit from their services. Most importantly, Woodward stresses that as long as libraries are receptive to change and evolve with their communities, they will ultimately survive.

In the introduction Woodward states that she is writing for other librarians. However, I would highly recommend this read to first-year library science (LIS) students as her book provides an excellent overview and summary of where libraries have been, their current state of affairs, and their future outlook. Woodward offers a good framework for such students beginning their studies; she gives them an accurate context within which to approach topics as they learn about the field and the future roles that information professionals will fulfill. Woodward's book would give LIS students a solid basis from which to contemplate the various types of communities they may be best suited to serve. Her book could also help students develop strategies for success in the profession. —*Shannon Fox (sfox@austincollege.edu), Austin College, Sherman, Texas*

Library Collection Development for Professional Programs: Trends and Best Practices. Edited by Sara Holder. McGill University: IGI Global, 2013. 478 p. $175 hardcover (ISBN: 978-1-4666-1897-8).

Librarians are inherently disadvantaged in collecting for professional programs as they often approach this responsibility as an outsider. Standard

(PDA) has several index entries, but inexplicably omits the PDA discussion in chapter 9. Another weakness concerns the graphics. Many screenshots are difficult to read, containing blurred or small print, which renders them nearly illegible.

These shortcomings make the text slightly more difficult to use, but do not make it any less valuable. Content is current as evidenced by chapter citations and relatively recent publishing events (EBSCO's purchase of H.W. Wilson, for example). Aspects of technical subjects are clearly explained and assume no prior knowledge of the discipline. Importantly, librarians with selection responsibilities for other academic and professional programs will be able to extrapolate much of the information to their own areas. This is a welcome and much-needed text for academic librarians with collection responsibilities for professional programs.—*Cathy Goodwin (cgoodwin@coastal.edu), Coastal Carolina University, Conway, South Carolina*

The Librarian's Legal Companion for Licensing Information Resources and Services. By Thomas A. Lipinski. Chicago: Neal-Schuman, 2013. 734 p. $130 paper (ISBN: 978-1-55570-610-4). The Legal Advisor for Libraries, Educators, & Information Professionals.

When the electronic publishing revolution launched with CD-ROM-based abstract and index services (A&I), the license substituted access for ownership and complicated library acquisitions forevermore. With the contract, libraries lost doctrines of fair use and first-sale that were so ingrained into the business of libraries as to be taken wholly for granted. Three decades after subscription budgets were gobbled up by "big deal" financials, does the library world need a 700-page print book on the subject of licensing information resources? Is there an acquisitions or collection development librarian left who is innocent of the complexities of these licenses, which tend at once to make available 24/7 more and more of the world's fund of intellectual achievement, but at staggering costs and restrictive conditions?

Tomas Lipinski surely does not intend his hefty monograph to be read through over serial sittings, by either the innocent or jaded licensing librarian. As director of the school of library and information service at Kent State University, he joins Tracy Mitrano (Cornell University) and Kenneth Crews (Columbia University) as one of the great legal authorities in American librarianship. Lipinski's purpose is to provide a sourcebook for licensing librarians to consult as they seek the second opinion of a serious intellectual property (IP) lawyer. His work's theme is reducible to "contract trumps copyright law"; he seemingly cannot repeat this enough, but given the widely and wildly variant contexts in which he makes this point, the admonition does not come off as hectoring.

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into arbitration with a vendor. Third, he delves into detail about disclaimers and warranties infecting every IT and library contract ever devised, but only reluctantly concedes that these are simply standard and effectively nonnegotiable. But just when Lipinski flirts with nudging his readers' attention span out of focus, he snaps "the licensor . . . [should warrant] that it has valid title to the content" being offered (496). An experienced library negotiator is not likely to overlook that caution, but the reminder is compelling. If nothing else, all parties to a contract have to be reassured that a third party will not emerge to claim infringement and sue library and publisher alike.

To be sure, Lipinski is not concerned with the non-IP details of licensing. These matters are attended to in other venues, beginning with The Charleston Advisor (www.charlestonco.com). A more historically influenced reading of licensing might have led him to focus less on coursepack restrictions, which recent trends in e-reserve concessions by licensors have mostly settled to the benefit of libraries. He does fret a great deal about some specific matters that get librarians equally fretful, but for different reasons. In dissecting Nature Publishing Group's (NPG) standard license, he objects that the chargeable users clause, which in turn depends on counting the number of "scientific department" students and staff, is rigged to trigger pricing adjustments always favoring NPG (599). True enough. But librarians are as likely to object that in the age of the comprehensive, inter-disciplinary university, the number of folks characterized as scientific department affiliates is so permeable as to be meaningless, and wish for some simple metric such as institutional enrolled FTE to be substituted. And there are some interesting omissions. He is silent on consortial licensing, which includes potentially tricky recitals and can complicate archiving provisions. While he resists offering a model license on the reasonable grounds that cases vary so greatly (635), such a claim undermines the purpose of his project, which is to bring all those variants into greater and uniform clarity. Even accounting for his distrust of model licenses and apparent indifference to consortia, surely the library-rights friendly license suggested by the NorthEast Research Libraries (NERL) is worth examination. And why not mention the Shared E-Resource Understanding (SERU) project of the National Information Standards Organizations (NISO), which intriguingly if quixotically seeks to return to old-fashioned sale and copyright regimes?

Lipinski's tome offers many practical features. He concludes most chapters with useful "learning examples" in which license terms—sometimes in the nature of apples to apples, sometimes apples to oranges—are juxtaposed and analyzed. An exhaustive glossary of licensing terms serves as more of an encyclopedia than dictionary, and despite his aversion to model licenses he does propose "twenty key clauses" (635–644) that will reward repeated consultation.

Perhaps because of the density of legal English and its estimable sweep, Lipinski's bottom-line is somewhat elusive. Reserved though he is about expressing bias toward his subject, there is no doubt he stands with libraries at every turn: "Restrictions on uses that under the copyright law would be lawful should not be prohibited; obligations which are impossible or nearly impossible to perform or which require monitoring or enforcing restrictions upon users should not be required" (673).

Those are prosaic words about an occasionally turgid topic, but with them Lipinski stakes out the advocacy position librarians ought to adopt in meeting their obligations to distribute and preserve original works of human understanding.—*Scott Silverman (silvermanscotth@gmail.com), Dresden, Maine*

Electronic Resource Management: Practical Perspectives in a New Technical Services Model. Anne C. Elguindi and Karen Schmidt. Oxford: Chandos, 2012. 203 p. $80.00 paper (ISBN: 978-1-84334-668-5). Chandos Information Professional Series.

This concise volume is part of the *Chandos Information Professional Series*, which aims to provide both readable and practical coverage of subjects of interest to librarians. It is not, as its title may suggest, a how-to guide for managing electronic resources, but rather a broad overview of how electronic resource management has evolved in a specific type of library over the last two decades with some learned speculation about what the future might hold. Or, as Elguindi and Schmidt neatly phrase it in their preface, "How have academic libraries and librarians changed to respond to electronic resources, and where might they be going?" (xvii–xviii). The book's six chapters cover a variety of important topics related to managing electronic resources, including: staffing and workflows, electronic resource management systems (ERMS), discovery tools, and e-books. Most chapters also contain useful case studies detailing local issues associated with electronic resource management at institutions such as Indiana State University, the University of Notre Dame, and Boston College.

Chapters 1, "Emerging Technical Services Models in the Context of the Past," and 2, "Electronic Resource Management: Staffing and Workflow," are the strongest pieces in the book. Each does a nice job of succinctly contextualizing current academic library approaches to e-resource management. In the first chapter, Elguindi and Schmidt identify two waves of

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organizational change in response to libraries' steadily increasing expenditures for electronic resources from the mid-1990s to the present. With few exceptions, the first wave saw libraries try to make do with existing organizational structures by adding e-resource responsibilities (e.g., license negotiation and knowledge base maintenance) to already established positions. In the second wave, many libraries underwent reorganizations to create positions or units specifically responsible for electronic resource management. The authors further identify an emerging and—they argue—necessary third wave in which responsibilities for managing all formats, especially electronic resources, are more diffused throughout various public-facing and behind-the-scenes units within organizations. In the second chapter, which builds directly on the first, the authors trace the evolution of the electronic resources librarian position. They note that while many libraries currently spend more on e-resources than on print materials, they often employ relatively few people to manage electronic resources compared to the number responsible for managing print. This state of affairs is untenable argue the authors. They contend that e-resource management should be viewed as the primary workflow in technical services, and all staff should have some level of proficiency with e-resource tasks.

Chapter 3, "Electronic Resource Management Systems: Implementation and Transformation," discusses the early development of ERMS and the myriad challenges associated with implementing these systems. It also describes widespread disappointment with the limitations of ERMS, including the general lack of interoperability with other systems and the resulting need to input and maintain data in multiple places. The authors also observe that while the next-generation of integrated library systems (ILS), such as Alma from Ex Libris and Sierra from Innovative Interfaces, have been developed as complete resource management systems that incorporate many functions of ERMS, it is too early to tell how successful they will be at meeting libraries' needs for managing electronic resources.

Chapter 4, "Discovery Systems, Layers and Tools, and the Role of the Electronic Resources Librarian," gives a brief overview of the history of OPACs, catalog overlays (e.g., VuFind), and federated searching in libraries. The authors make the case that those who manage e-resources are well suited to play a significant role in the selection, implementation, and management of the current generation of discovery tools. Despite their flaws, these discovery systems are necessary tools if libraries are to remain viable starting points in the research process. In addition, the authors see these tools as offering challenges and opportunities for others in technical services—such as catalogers and acquisitions personnel—in that they need to be aware of how the data they work with is being used in systems outside of the ILS, and that they too have a role to play in the management and continual improvement of discovery products. Both this chapter and the chapter on ERMS that precedes it are quite good at quickly synthesizing information about the history of the systems discussed, and offer sensible advice for how technical services can evolve to better meet the needs of end users.

The book closes with two chapters, "Academic Library Consortia and the Evolving Role of Electronic Resources and Technology," and "Conclusion: E-books and the Future of Technical Services," that are less satisfying than the others. The chapter on consortia feels somewhat rushed. The description of how a switch from print-centric to electronic-centric collections will affect these organizations—something that should be a meaty topic for a book with this focus—is given very short shrift. Likewise, I was disappointed by the authors' lack of focus on the implications of patron-driven acquisitions in the concluding chapter on e-books. A separate, fully fleshed out chapter summarizing the authors' vision for the future of technical services would have been a more welcome conclusion to the book.

Despite these drawbacks, I found this book to be a compelling and enjoyable read. It is clear that the authors were not aiming to treat exhaustively these topics, so certain omissions are understandable. While I think this book would be of most value to library students or those new to the field, it should also be of interest to anyone working in technical services.—*Bill Walsh (wwalsh@gsu.edu), Georgia State University, Atlanta, Georgia*