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Editorial

Mary Beth Weber



In the course of my work and in my personal life, I frequently encounter people who ask about my work and are unfamiliar with how libraries operate, particularly technical services. They are unaware of how materials are selected or obtained, the steps necessary to catalog a resource and enable users to find it, the importance of carefully and properly handling materials, the challenges of collection management, and the importance of preserving fragile and damaged materials. Our community is built around shared standards and ideals. I suspect many of us were attracted to this profession because we are “information junkies” and share the goal of bringing together people and information, regardless of whether one serves on the frontlines or coordinates the behind-the-scenes work that makes delivery of information possible.

Librarians are generous with sharing expertise. We benefit from conferences and other opportunities, such as webinars, e-forums, and discussion lists, to share and discuss information. Discussion lists abound with messages about patron-initiated purchasing, transitioning to RDA, tracking perpetual rights or determining number of users, etc. Library professionals also benefit from belonging to professional associations. Professional associations take on an added benefit when one is actively involved. Shrinking (or nonexistent) travel budgets and improved technology have led to virtual participation, making it possible to be engaged and active from a distance.

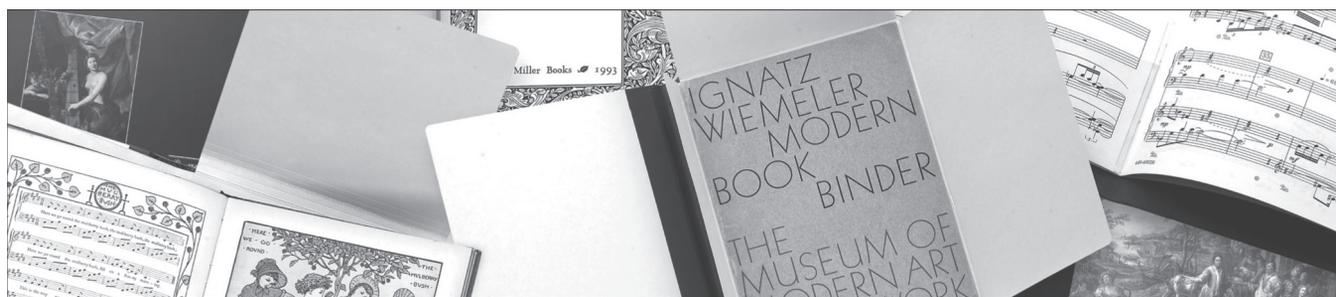
Publishing papers in scholarly journals is another way we disseminate and share information. Scholarly journals and other publications (e.g., white papers, newsletters) provide the benefit of shared expertise that can guide our work. A benefit to me as *LRTS* editor is the opportunity to work with authors and guide their papers through the publication process, which includes a double-blind review by two members of the editorial board. This process is applied to all submissions, regardless of who the author may be.

Technical services is in a time of transition, which is fueled in part by the economy and shrinking budgets. We are developing creative solutions to deal with fewer staff and growing workloads. Emerging areas of interest, such as research data, are an added consideration. Technology enables us to serve more users simultaneously and often remotely, yet it also brings a host of new complications to our work. Acquiring an electronic resource includes considerations of licensing and rights, particularly perpetual rights. It may include a decision to keep or discontinue a print version of a title. Adding electronic resources to a collection may require cataloging decisions such as whether to provide separate records for each version or to use merged-format records. Cataloging can also include the choice of vendor-supplied records and how to handle them for one’s local needs and catalog. The process does not end with cataloging because electronic resources include collection management implications. Preservation takes on added significance in the electronic era. Fragile and rare materials are digitized so that they may be shared widely, and this often spurs a desire for users to see the originals. Preservation and archiving of digital content is also a consideration.

Any of these topics are appropriate for a research paper. I encourage you to consider submitting a paper to *LRTS* to share your experiences and expertise. Papers can build on a presentation or summarize and analyze survey results or other research. Papers from all types of libraries are welcome. If you are not ready to submit a paper, consider writing a book review for *LRTS*. Information for authors and book reviewers is available at www.ala.org/alcts/resources/lrts.

In closing, I would like to bring your attention to the contents of this issue:

- Sarah Glasser discusses the results of an online survey about perpetual access for electronic serials that have been canceled, have ceased, or have transferred to different publishers.
- Natalia Tomlin and Irina Kandarasheva provide an assessment of shelf-ready materials management practices in US academic libraries. Their paper analyzes results of a survey on shelf-ready materials management and cataloging practices by libraries with various collection sizes.
- Kathleen A. Lehman reviews collection development literature from 2011 and 2012, and explores how libraries are making difficult choices with decreasing funds, competing needs for space, and a continually developing e-market.
- Cathy Blackman et al. examine the differences between the cataloging utilities OCLC and SkyRiver. They consider hit rates, total number of records found for each title in their sample, the number of non-English language records, and the presence and completeness of several elements in the most-held bibliographic record for each title.
- Catalogers have become fluent in information technology, including web design skills, HyperText Markup Language (HTML), Cascading Stylesheets (CSS), eXensible Markup Language (XML), and programming languages. Violeta Ilik, Jessica Storlien, and Joseph Olivarez explore how knowledge gained from learning information technology can be used to experiment with transforming one metadata schema into another via software solutions.



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Providing Perpetual Access

Results of a Survey

Sarah Glasser

This paper presents the results of an online survey about perpetual access for electronic serials that have been canceled, have ceased, or have transferred to different publishers. The survey sought to ascertain the true experiences of libraries working to maintain perpetual access. Results indicate a high success rate for providing perpetual access. Results also indicate a lack of standardization for and many challenges to keeping track of and providing perpetual access. A discussion section expands on key findings and the most common obstacles to providing perpetual access.

Much has been written in the library literature about the move from print to electronic serials, the debate over access versus ownership, and the perpetual access clauses of various content providers. However, there is little information in the literature that explores the actual attempts made by libraries to invoke perpetual access. Significant moves from print to electronic serials, the discarding of print serial holdings and, more recently, large cancellation projects, including Big Deal cancellations, bring this issue to a head. This paper presents the results of an online survey that sought to uncover the true experiences of libraries working to provide and maintain perpetual access to electronic serials that have been canceled, have ceased, or have transferred to different publishers. Questions cover the conditions under which libraries pursue perpetual access, the varying reasons for success or lack of success, and the cost, both monetary and labor-based, of providing such access. A discussion section expands on key findings and the most common obstacles to providing perpetual access. For the purpose of this paper, perpetual access is defined as access to the years of content paid before the affected serials were canceled, ceased publication, or transferred to different publishers.

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Literature Review

Several people have documented the vagueness in the language of perpetual access clauses in publisher licenses for electronic journals (e-journals).¹ Beh and Smith analyzed the perpetual access clauses of nineteen of their libraries' e-journal licenses and found the wording so convoluted, they did not know to

what they were entitled.² Stemper and Barribeau analyzed the perpetual access clauses of forty of their libraries' e-journals licenses and found that while most of the publishers offer some form of perpetual access, it is not always clear what it entails.³ They provide examples of language vagueness, such as using "reasonable efforts" and "discuss[ing] a mechanism" for providing perpetual access.⁴ Wolf outlines situations where perpetual access is offered, but in an unusable format, such as a nonsearchable DVD or raw data that requires server space, a search interface, and a way to limit use to library patrons. He advocates working with publishers "to provide reasonable standards and expectations for perpetual access."⁵

This vagueness in the language of perpetual access license clauses has caused skepticism regarding publishers' ability to provide perpetual access. A survey by Watson found that some librarians "did not trust e-journal providers to continue archival access, even if it were guaranteed in a license agreement."⁶ Similarly, Beh and Smith voice "profound concerns regarding the library's ability . . . to provide meaningful perpetual access to previously subscribed content to its users."⁷ Carr writes that even when perpetual access provisions do exist, the "means of carrying out these provisions are oftentimes insufficiently developed."⁸ Finally, Watson worries that "loss of archival access seems inevitable."⁹

The extensive work required by libraries to provide perpetual access for e-journals has also been documented in the library literature. Bascones outlines record-keeping shortfalls and how complicated and time-consuming it can be to confirm perpetual access entitlements.¹⁰ She notes that some libraries found it was not worth the time and effort.¹¹ Watson found that some libraries did not want the extra work associated with using formats such as CD-ROMs for archival access.¹² The added complexity of journal titles that transfer to different publishers is noted by Beh and Smith, Stemper and Barribeau, and Watson.¹³

Nothing was found in the literature that documents the actual experiences of libraries attempting to provide perpetual access to e-journal content that has been canceled, ceased, or transferred to different publishers. Beh and Smith note that their library has not yet had the opportunity to test perpetual access for more than a few transferred titles.¹⁴ Similarly, Watson found that many of her survey respondents had not canceled enough e-journals to report on perpetual access success rates.¹⁵

Survey Results

The perpetual access survey was created using the Qualtrics survey software (<http://qualtrics.com>) and a link to it was posted to the ERIL-L, LIBLICENSE-L, and SERIALST discussion lists. The survey remained open for six weeks,

from August 6 through September 17, 2013. Two hundred responses were received. A copy of the survey is in the appendix.

The majority of survey respondents (74 percent) work at a university. None of those who completed the survey work at a community college, 12 percent works at a four-year college, and the remaining respondents (14 percent) work at other types of institutions, such as medical libraries, law libraries, government institutions, and nongovernmental research institutes.

The respondent institutions' FTE (full-time equivalent) student body varied from 2,500 or fewer (16 percent) to 30,001–45,000 (9 percent), with most institutions having a student FTE in the 2,501–10,000 range (26 percent), the 10,001–20,000 range (24 percent), and the 20,001–30,000 range (26 percent). Sixty percent of the respondents worked at institutions with a serials budget of \$1 million or more. Many respondents were unsure as to what percentage of the serials collection in their library is electronic. Of those who provided a percentage, 60 percent said that 80 percent or more of their serials collection is electronic.

The first survey question addressed the situations in which the respondents' libraries had the opportunity to invoke and thus test perpetual access provisions for electronic serials. Multiple answers were permitted, and respondents were asked to check all that applied. Eighty percent replied that they invoked perpetual access for individual canceled titles, 62 percent for transferred titles, 60 percent for ceased titles, and 26 percent for full Big Deal e-journal packages that had been canceled (see figure 1). A small percentage (6 percent) indicated "other" and included situations such as small canceled packages (e.g., society packages) and when a company was acquired by another.

The next few questions focused on the main survey objective and asked how often respondents' libraries were able to successfully provide perpetual access, in what form the perpetual access was provided when successful, and the reasons for unsuccessful attempts. Somewhat surprisingly, 92 percent of survey respondents indicated that their libraries were successfully able to provide perpetual access always (13 percent), often (39 percent), or sometimes (40 percent). If the "sometimes" responses are removed, the number still exceeds 50 percent (52 percent). Only 2 percent answered that their library was never successful, and 6 percent indicated rarely (see figure 2).

Of the respondents who indicated that their libraries were able to successfully provide perpetual access to their users, 87 percent did so by continuing to link to the publisher's website; 56 percent provided access by linking to a membership archive such as LOCKSS, CLOCKSS, or Portico; 14 percent referred users to CD-ROMs, DVDs, or external drives that can be accessed on request; and 9 percent linked to content stored on a library server (see figure

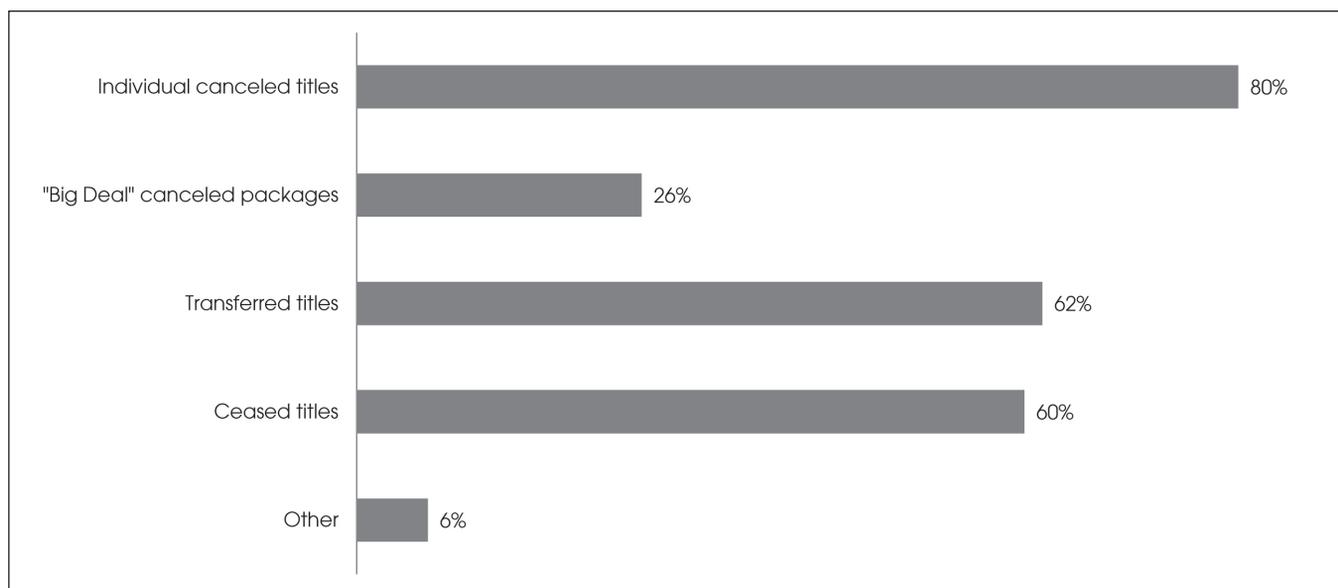


Figure 1. Survey responses to the question "In What Situations Has Your Library Had the Opportunity to Invoke and Thus Test Perpetual Access Provisions for Electronic Serials?"

3). Another 7 percent selected "other" and specified details such as using EBSCO's Electronic Journals Service (EJS), linking to content stored on a consortium server, or linking to an institutional repository for local materials. Comments that accompanied responses to this question expose a preference for linking to the publisher or provider's website. One respondent expressed that this preference over linking to an archive such as LOCKSS, CLOCKSS, or Portico was due to the ability to use the library's link resolver.¹⁶ Another respondent mentioned only providing perpetual access if available via the publisher or provider's website. Two respondents commented that their libraries have CD-ROMs and hard drives but do not currently make them accessible to users, and one said his library would accept CD-ROMs if there is no other option. Two respondents relayed experiences of successful perpetual access only after logging significant and time-consuming complaints to the publisher.

Regarding reasons for unsuccessful attempts, more than half of the respondents (51 percent) indicated that they were unable to provide perpetual access to users because the publisher offered perpetual access in an unworkable form, such as CD-ROMs, external hard drives, DVDs, raw data that would have to be hosted on the institution's own server, and emails with PDF attachments (see figure 4). This high number indicates that while some libraries are providing perpetual access to users via CD-ROMs and other external data (14 percent, see above), such an arrangement is unworkable and unacceptable for many other libraries. The following comment from a survey respondent sums up the issue:

We have stacks of DVDs, CDs, etc. whose content cannot be uploaded to a searchable platform, which users would want. We have one computer that stores all the PDF downloads . . . but those are not "discoverable" by anyone—staff included. I have PDFs of issues that were emailed to my address as the journal admin. We have ancient mag tape and floppy discs that can no longer be read. We may as well not have this content at all, as we have no way of serving it and making it searchable or linkable. We cannot put paid content in our institutional repository because we have no way to keep non-institutional users out. We could possibly process the [*sic*] circulate a CD or DVD, but if it is not returned, an entire journal archive is lost. And . . . of course, we don't have the staff to process this material anyway.¹⁷

As the above comment notes, staff needs are also an issue. Indeed, 45 percent of survey respondents indicated that lack of staff at their institutions was a reason for unsuccessful perpetual access attempts (see figure 4). The other reasons were lack of funds for the fee required for continued access (26 percent), and "other" (36 percent). The most common reasons specified for "other" were lack of documentation proving payment for the years in question, claim denials following title transfers (new publisher did not honor former publisher's agreement), lack of license, and that the usage of some titles was not worth the perpetual access fee. Comments following this question confirmed

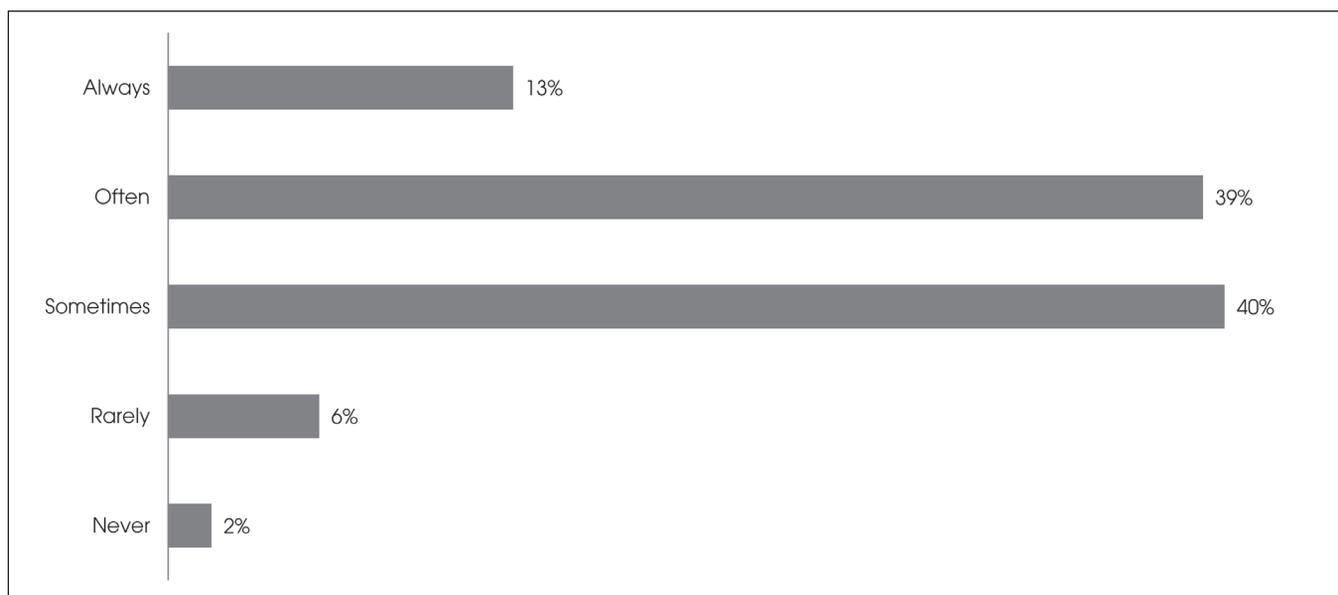


Figure 2. Survey responses to the question "How Often Has Your Library Been Able to Successfully Provide Perpetual Access?"

that missing payment documentation, particularly for payments more than five years old, and titles that transferred to new publishers with different policies are common obstacles to providing perpetual access. Other comments disclosed a frustration with the vagueness of license agreements and a declaration of the extensive work required to provide and maintain perpetual access to e-journals.

Considering the comments regarding the extensive work required to provide and maintain perpetual access, it is not surprising that 63 percent of respondents indicated that this responsibility falls to a professional librarian. Twenty percent indicated that support staff are responsible; not one respondent indicated that a student is responsible for this work. However, 18 percent chose "other," almost all of whom specified that setting up and maintaining perpetual access is a team effort, involving librarians, support staff, and in some cases systems or information technology (IT) personnel.

In addition to labor costs, 15 percent of respondents reported that their library pays a monetary fee for perpetual access, and 46 percent answered that their library pays a fee in some cases. Only 39 percent of respondents answered that their library does not pay a fee. Comments indicate that in many cases, the library pays no fee as long as it still holds some subscriptions with the publisher or vendor. Some commented that a hosting fee is paid if justified by usage. One respondent wrote that if a fee were specifically mentioned in the license, the library would pay it. However, there were also several comments on membership fees paid for Portico or costs for the purchase of legacy collections. This was not the intent of the question, and this misunderstanding may

have skewed the results. For this reason, the responses to this question are of limited value.

The remaining survey questions were open-ended. One asked respondents what they thought was the most challenging part of providing perpetual access. Four areas emerged as particularly challenging issues affecting the success of perpetual access: the work involved, documentation, dealing with transferred titles, and license issues.

Most often mentioned was the extensive work involved, specifically determining eligibility, setting up linking, checking and rechecking access (several mentioned that access periodically disappears), claiming lost access, and dealing with files like CD-ROMs and archiving issues. Documentation was the next most often mentioned challenge, with many acknowledging shortfalls in record keeping and the difficulties of tracking down payment history, determining which titles are core or "subscribed" titles (often with Big Deals only the core, initially subscribed titles are eligible for perpetual access), and knowing when perpetual access eligibility began. One survey respondent portrays the issue well in this comment:

For journals, it's keeping up with when your perpetual access officially begins. Our record-keeping practices have varied so widely over the years that in many cases, it's nearly impossible to determine when we officially added e-access to our subscriptions, and I'm loathe to just take the publishers at their words—I doubt their records are that much better than ours.¹⁸

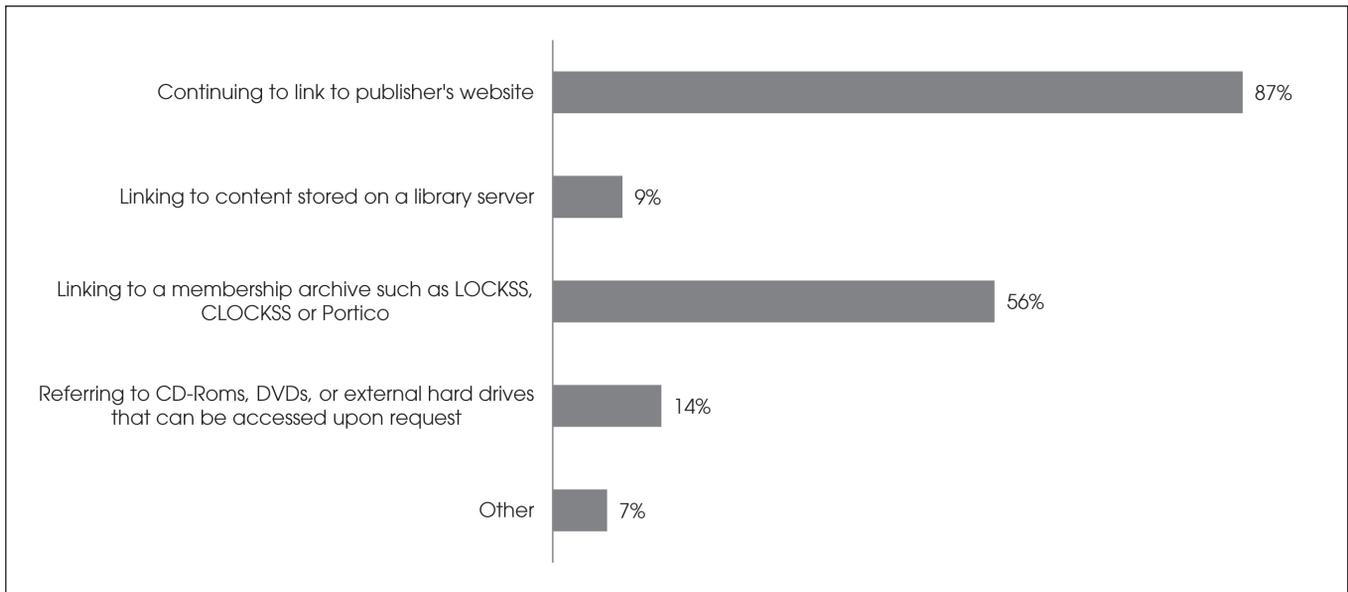


Figure 3. Survey responses to the question "When Providing Perpetual Access is Successful, How is it Provided?"

Dealing with titles that transfer to a different publisher was the third most mentioned challenge and a clear source of frustration and time-consuming efforts. Several comments referred to situations where perpetual access was lost because the new publisher did not honor the former publisher's agreement. Even when perpetual access is not lost, keeping track of where the perpetual access is hosted for transferred titles (new publisher, former publisher, vendor platform) is a formidable task that requires staff time that many libraries simply do not have.

The final issue most often mentioned as a challenge to providing perpetual access relates to licenses. A specific area of difficulty is the vagueness of license wording. Such vagueness leaves libraries unsure about the extent and format of the perpetual access available to them should titles cease or be canceled. Other challenges concern outdated licenses that were signed before libraries began insisting on perpetual access language, publishers that do not offer any type of perpetual access, and smaller publishers that do not use licenses.

The survey concluded with an open-ended question allowing for any additional comments from respondents. Comments were generally positive, with two respondents explicitly stating that they have experienced few problems regarding perpetual access. Numerous comments touched on the importance of perpetual access provisions in licenses, and several explicitly mentioned that they do not move subscriptions to electronic-only unless perpetual access is offered. One respondent from a European institute mentioned difficulties with non US/UK publishers that are unfamiliar with perpetual access and smaller publishers that

are unable or unwilling to offer perpetual access guarantees. And lastly, one comment mentioned the major role consortia can play in facilitating perpetual access from both a licensing and a technical standpoint.

Discussion

The survey results indicate a high success rate for providing perpetual access to electronic serials (92 percent of survey respondents indicated that their libraries were successfully able to provide perpetual access always, often, or sometimes). However, results also indicate a lack of standardization for and many challenges to keeping track of and providing perpetual access. While the state of perpetual access does not seem as dire as Beh and Smith and Watson feared, the sheer amount of work involved, record keeping shortfalls, the vagueness of license agreements, the wide range of ways in which perpetual access can be (and is) offered, and the uncertain nature of transferred titles all limit the success of providing perpetual access to users.

Improved record keeping and more standardized perpetual access clauses in licenses could alleviate some of these challenges. Bascones reports on an effort in the United Kingdom to create a Post-Cancellation Entitlement Registry that would provide authoritative records on the perpetual access rights for UK higher education institutions.¹⁹ Such a registry, if successfully created and maintained, could save a lot of time, provide definitive information on perpetual access entitlements, and ultimately improve access. However, success of such an initiative relies on the involvement

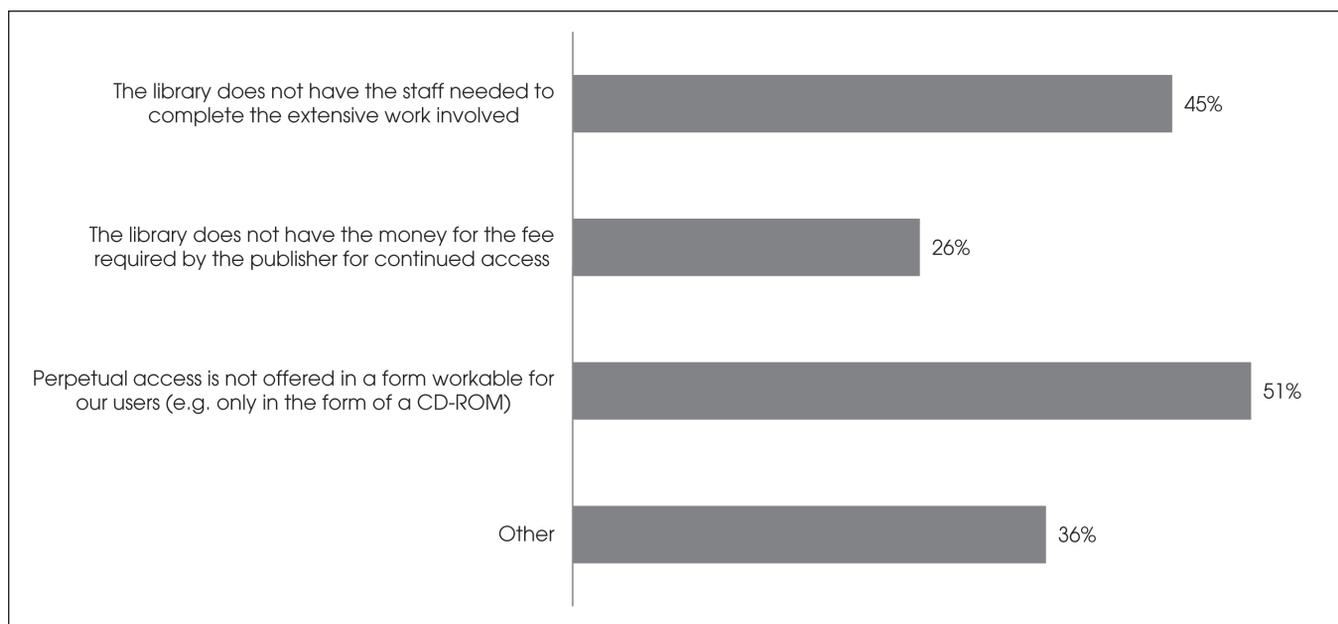


Figure 4. Survey responses to the question “When Providing Perpetual Access is Unsuccessful, What are the Reasons?”

of all stakeholders and a commitment to better record keeping. Furthermore, this project is specific to higher education institutions in the United Kingdom.

Standardization of the perpetual access clauses in license requirements is probably the most difficult obstacle to overcome. While many libraries show a commitment to perpetual access by insisting that it is offered before switching journal subscriptions from print to electronic, it is not always possible for publishers to be as specific as libraries would like. Until publishers can be more specific, problems with language vagueness in perpetual access license clauses will continue. The National Information Standards Organization (NISO) sponsors two license-related initiatives, but neither requires specific perpetual access language, nor can either require publishers to offer perpetual access in any particular form. The two initiatives are ONIX for Publications Licenses (ONIX-PL) and Shared Electronic Resources Understanding (SERU). ONIX-PL, a joint initiative between EDItEUR and NISO, is an XML schema that, together with a dictionary of controlled vocabulary for license terms, makes licenses machine-readable, thereby enabling license information to be ingested into library electronic resource management systems (ERMS).²⁰ It is a way to map the information from the license document to fields in a library’s ERMS. This helps libraries to manage their electronic resources and can help with perpetual access documentation, but it only maps the information that is in the license signed by both parties. It does not mandate or suggest any specific requirements. SERU is an alternative to the complexity of licenses. If both the library and the publisher agree to adhere to the SERU

guidelines, as outlined in the NISO SERU Recommended Practice, SERU can be used in lieu of a license.²¹ The SERU guidelines include a section stating that perpetual access will be provided, but it does not specify how.²² In sum, while these two initiatives support perpetual access, they cannot solve the problem of vagueness in perpetual access license clauses. Publishers, libraries, and other stakeholders must continue to work together to agree on terms acceptable to all parties.

It is not surprising that perpetual access offered in unworkable, often unsearchable, forms such as CD-ROMs is a significant obstacle to the success of providing perpetual access (51 percent indicated this as a reason for failed attempts). With link resolvers and discovery systems fueling much of the discovery of and access to electronic content, housing content outside of this structure simply does not work well. Not only does it require extra work on the part of library staff, but it also requires users to come to the library for access, defeating much of the original purpose of moving from print to electronic format. In many cases, perpetual access offered on CD-ROMs, as PDFs, or in other external hardware formats is equivalent to no perpetual access at all.

Of all the forms in which perpetual access can be offered, survey results show a preference for access through the publisher or provider’s website. This allows for continued linking through the link resolver, retains the look and functionality to which users are accustomed, and is easily incorporated into current workflows. While LOCKSS, CLOCKSS, and Portico can be linked through link resolvers, it requires additional set up and changes the look of access

for users. Additionally, these archiving initiatives have membership fees and are limited to the content of participating publishers. In their joint report on LOCKSS and other preservation initiatives, 2CUL (Cornell University and Columbia University) found that only a relatively small percentage of their e-journal holdings were preserved in LOCKSS and Portico.²³ They also note that the titles preserved in LOCKSS and Portico are almost exclusively limited to those with an ISSN or an e-ISSN. CLOCKSS is a so-called “dark archive” that requires a “trigger event” for access; cancellation or transfer of a title does not meet the requirement for such an event.²⁴ Portico also requires a trigger event but offers a separate “post-cancellation access” (PCA) option.²⁵ The PCA option is only available if the publisher agrees to it. At the time of the writing of this paper, 147 (77 percent) of the 190 e-journal publishers that participate in Portico allowed their content to be accessed for PCA.²⁶ Even when PCA is allowed through Portico, libraries still need to show proof that they paid for subscriptions for the years in question, which, as noted above, can be problematic. Libraries also need to maintain their Portico subscriptions to continue PCA through Portico. LOCKSS can be used for perpetual access, but requires staff time to set up and maintain. When the 2CUL report was issued (October 2011), neither Cornell University nor Columbia University were making content from LOCKSS available to their users; instead, they were using it as a dark archive.²⁷ In sum, while these three initiatives all provide an important preservation service, and two of the three can provide perpetual access to many titles, they are not a comprehensive solution for libraries hoping to provide perpetual access for e-journals that have been canceled, have ceased, or have transferred to different publishers.

And finally, transferred titles clearly represent a challenge when it comes to providing perpetual access. This was mentioned in both the comments regarding unsuccessful perpetual access attempts and the comments on the most challenging part of providing perpetual access. Despite the existence of the TRANSFER Code of Practice, a standard created by the United Kingdom Serials Group (UKSG), perpetual access to transferred titles is often lost. As Watson states, “Even when vendors do promise archival access, they cannot guarantee continued access when a journal changes publisher or a publisher changes its relationship with a third party vendor.”²⁸ Beh and Smith similarly note that “despite the clause in the contract, perpetual access is guaranteed only when the title remains with the original publisher.”²⁹ However, there is hope that this will change. The latest version of the Transfer Code of Practice (Version 3.0) includes a new section on licensing terms with the following language: “The receiving publisher will ensure that any content that has been previously published under license without charge to users will continue to be made available under the existing terms.”³⁰ This has the potential to greatly increase the

success rate of providing perpetual access when titles transfer to new publishers.

Conclusion

This paper reports on a survey that sought to provide a deeper understanding of the extent to which libraries are pursuing perpetual access and the outcomes of such attempts for electronic serials that have been canceled, have ceased, or have transferred to different publishers. Results indicate a high level of success and a preference for such access by continuing to link to the publisher or provider’s website. The four top challenges to providing perpetual access are the extensive work involved, documentation shortfalls, dealing with transferred titles, and license issues. In some cases, the library simply lacked the staff to complete the work required to provide perpetual access (determining if the library is eligible for perpetual access, contacting the publisher to find out how perpetual access will be provided, verifying access, updating the link resolver, updating the bibliographic record, etc.). Clear, consistent licensing language for perpetual access clauses would help. Better documentation for records more than five years old would also help. No longer accepting nonintegrated forms of perpetual access such as CD-ROMs could increase the success rate of perpetual access. Archiving initiatives such as LOCKSS, CLOCKSS, and Portico are important, but are currently not comprehensive enough, and in the case of CLOCKSS and sometimes Portico, are not able to offer perpetual access when subscriptions are canceled. Transferred titles have always caused librarians extra work and perpetual access is no exception. However, the newest version of the UKSG Transfer Code of Practice could bring improvement with an additional section requiring the transfer publisher to honor the perpetual access entitlements of the former publisher.

The state of perpetual access is not as bad as many have feared. Hopefully, with more awareness, improved transfer policy, more diligent record keeping, and more standardized license language, things will improve.

References and Notes

1. Although the survey uses the term “electronic serials,” many of the respondents as well as many of the articles cited in the literature review use “e-journals.” For this reason, both terms are found in the article; their meaning is interchangeable.
2. Eugenia Beh and Jane Smith, “Preserving the Scholarly Collection: An Examination of the Perpetual Access Clauses in the Texas A&M University Libraries’ Major E-Journal Licenses,” *Serials Review* 38, no. 4 (December 2012): 235–42.
3. Jim Stemper and Susan Barribeau, “Perpetual Access to Electronic Journals: A Survey of One Academic Research

- Library's Licenses," *Library Resources & Technical Services* 50, no. 2 (April 2006): 91–109.
4. *Ibid.*, 102.
 5. Robert Wolf, "Budget Crisis: A Review of Perpetual Access," *North Carolina Libraries* 67, no. 1–2 (2009): 34, accessed November 27, 2013, www.ncl.ecu.edu/index.php/NCL/article/viewFile/280/315.
 6. Jennifer Watson, "You Get What You Pay For? Archival Access to Electronic Journals," *Serials Review* 31, no. 3 (2005): 203.
 7. Beh and Smith, "Preserving the Scholarly Collection," 242.
 8. Patrick L. Carr, "The Commitment to Securing Perpetual Journal Access: A Survey of Academic Research Libraries," *Library Resources & Technical Services* 55, no. 1 (January 2011): 5.
 9. Watson, "You Get What You Pay for?" 204.
 10. Magaly Bascones, "JISC Collections: Post-Cancellation Entitlement Registry Scoping Project," *Collaborative Librarianship* 4, no. 3 (2012): 85–95. Bascones uses the term "post-cancellation," but for consistency, this paper will use "perpetual access."
 11. Bascones, "JISC Collections," 92.
 12. Watson, "You Get What You Pay for?" 203.
 13. Beh and Smith, "Preserving the Scholarly Collection"; Stemper and Barribeau, "Perpetual Access to Electronic Journals"; Watson, "You Get What You Pay for?"
 14. Beh and Smith, "Preserving the Scholarly Collection," 239.
 15. Watson, "You Get What You Pay for?" 203.
 16. Currently, it is possible to link CLOCKSS, LOCKSS, and Portico content through many link resolvers.
 17. Comment section following Question 3, from author's Perpetual Access Survey.
 18. Response to question 7 from author's Perpetual Access Survey (see appendix).
 19. Bascones, "JISC Collections."
 20. "ONIX-PL," EDItEUR, accessed December 23, 2013, www.editeur.org/21/ONIX-PL.
 21. National Information Standards Organization, "SERU Recommended Practice (RP-7-2012)," accessed December 23, 2013, www.niso.org/publications/rp/RP-7-2012_SERU.pdf.
 22. *Ibid.*, 5.
 23. Cornell University Library and Columbia University Library, "Final Report of the 2CUL LOCKSS Assessment Team," October 2011, accessed December 13, 2013, <http://2cul.org/sites/default/files/2CULLOCKSSFinalReport.pdf>.
 24. "CLOCKSS: A Trusted Community-Governed Archive," CLOCKSS, accessed December 16, 2013, www.clockss.org/clockss/Home.
 25. "E-Journal Preservation Service," Portico, accessed December 16, 2013, www.portico.org/digital-preservation/services/e-journal-preservation-service.
 26. "Who Participates in Portico? Publishers," Portico, accessed December 16, 2013, www.portico.org/digital-preservation/who-participates-in-portico/participating-publishers.
 27. Cornell University Library and Columbia University Library, "Final Report of the 2CUL LOCKSS," 3.
 28. Watson, "You Get What You Pay for?" 203.
 29. Beh and Smith, "Preserving the Scholarly Collection," 242.
 30. United Kingdom Serials Group (UKSG), "Transfer Code of Practice: Version 3.0" (consultation draft), 5, accessed November 27, 2013, www.uksg.org/sites/uksg.org/files/TRANSFER_Code_of_Practice_CONSULTATION%20DRAFT_V3.0.pdf.

Appendix: Perpetual Access Survey

This survey seeks to ascertain the extent to which perpetual access is being pursued and provided for electronic serial titles that have been canceled, have ceased, or have transferred to different publishers. If you work at a library that has had the opportunity to test perpetual access provisions—whether successful or not—your participation would be very much appreciated. All answers will be kept confidential. Thank you in advance for your participation.

1. In what situations has your library had the opportunity to invoke and thus test perpetual access provisions for electronic serials? Check all that apply.
 - For individual canceled titles
 - For entire "Big Deal" e-journal packages that have been canceled
 - For transferred titles
 - For ceased titles
 - Other, please specify:
2. How often has your library been able to successfully provide perpetual access?
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
 If Always Is selected, skip to question 4.

3. When providing perpetual access is unsuccessful, what are the reasons? Check all that apply (section for additional comments is below).
 - The library does not have the staff needed to complete the extensive work involved.
 - The library does not have the money for the fee required by the publisher for continued access.
 - Perpetual access is not offered in a form workable for our users (e.g. only in the form of a CD-Rom). Please specify:
 - Other reason(s), please specify:
Comments:
4. When providing perpetual access is successful, how is it provided? Check all that apply (section for additional comments is below).
Skip this question if “Never” is selected in question 2.
 - By continuing to link to publisher’s website
 - By linking to content stored on a library server.
 - By linking to a membership archive such as LOCKSS, CLOCKSS or Portico
 - By referring to CD-Roms, DVDs, or external hard drives that can be accessed upon request
 - Other, please specify:
Comments:
5. Who is responsible for setting up and maintaining perpetual access at your library?
 - Librarian
 - Support staff
 - Student
 - Other, please specify:
6. Does your library pay a fee to the publisher for perpetual access?
 - Yes
 - No
 - In some cases. Please elaborate:
 - Don’t know
7. What would you say is the most challenging part of providing perpetual access?
 - Community college
 - 4-year college
 - University
 - Other, please specify:
8. At what type of institution do you work?
 - Community college
 - 4-year college
 - University
 - Other, please specify:
9. What is the approximate size of your institution’s student body in FTEs (full-timee equivalent)?
 - 2,500 or less
 - 2,501–10,000
 - 10,001–20,000
 - 20,001–30,000
 - 30,001–45,000
 - more than 45,000
10. Approximately what is your library’s total annual budget (USD) for serials—including both electronic and print?
 - under \$50,000
 - \$50,000–\$99,999
 - \$100,000–\$249,000
 - \$250,000–\$499,999
 - \$500,000–\$999,999
 - \$1 million or more
 - Don’t know
11. Approximately what percentage of your serials collection is electronic?
12. Any additional comments? Please add below.

Thank you for your participation!

Ready or Not?

An Assessment of Shelf-Ready Materials Management Practices in US Academic Libraries

Natalia Tomlin and Irina Kandarasheva

This paper analyzes results of a survey on shelf-ready materials management and cataloging practices in US academic libraries with various collection sizes. The survey respondents consisted of managers and librarians in technical services operations. Survey questions addressed topics such as the volume of shelf-ready materials, perspectives on shelf-ready expansion, the effect of local cataloging practices on shelf-ready services, the amount of cataloging and processing errors, and quality control. The majority of participants were from small- and medium-size academic libraries, and print materials were the prevalent format for shelf-ready treatment. Two main reasons for shelf-ready implementation across libraries of all sizes were the need to improve materials turnaround time and the desire to redeploy staff for other projects or tasks.

The acquisition of library materials in shelf-ready form is one of the outsourcing strategies implemented by technical services departments to improve efficiency, reduce costs, and increase patron satisfaction. Shelf-ready materials supplied by vendors include physical items accompanied by full bibliographic records and physical processing such as application of barcodes, spine labels, security strips, etc. As the current library environment is moving toward management of electronic resources, the possibility of streamlining receiving, cataloging, and processing of materials in non-electronic format is potentially a very welcome alternative to the traditional acquisitions to cataloging model. While some libraries gained substantial experience in managing shelf-ready operations during the last decade, others are still contemplating the idea or are unsure of the implications that shelf-ready services could have for their libraries' databases and staffing. Potential concerns linked to the implementation of shelf-ready services can include extra review of vendor-supplied records, presence of less than full bibliographic records, and changes in work assignments for technical services staff. The review of current library literature reveals a need for assessment of academic libraries' practices in shelf-ready materials management.

The authors designed a survey to gain insights into different aspects of acquiring shelf-ready materials in US academic libraries with varying collection sizes. The authors were particularly interested in gathering feedback on the quality of bibliographic records for shelf-ready materials and their effect on local cataloging practices, including authority work. The implication of the new cataloging code,

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Resource Description and Access (RDA), and its effect on shelf-ready workflows was also assessed.

Literature Review

Academic libraries in the United States have been using shelf-ready services as a form of outsourcing for the past fifteen years. The topic itself, however, has not been frequently discussed in library and information science literature. Perhaps the lack of research could be explained by libraries' desire to have sufficient practical experience with shelf-ready operations before assessing this type of outsourcing. There is almost a ten-year gap between the first case study by Joy and Lugg, which addressed various aspects of shelf-ready materials management, and the beginning of subsequent publications on this topic in library science journals.¹ To date, the published research on the use of shelf-ready services in academic libraries is represented mostly by case studies on cost-benefits analysis, bibliographic record quality, and workflow evaluation. In addition, some research data on shelf-ready operations is available in the archives of the cataloging and authorities discussion list Autocat. The following literature review examines these studies and other papers on outsourcing relevant to shelf-ready materials.

A comprehensive review of the literature on outsourcing by Sweetland offers a concise definition of shelf-ready services: "The books (or other material) are catalogued, provided with barcodes, spine labels, covers, and the like by the vendor."² Furthermore, Shippy and Krug underscore the highly customizable nature of shelf-ready services and define it as a "set of custom services that you design à la carte."³ Joy and Lugg briefly examine the reasons why libraries turned to the shelf-ready option.⁴ Reductions in technical services budgets and the subsequent staffing losses, plus high shipping costs for materials (particularly to libraries in US academic institutions overseas in Hong Kong, Singapore, and Australia) were the main reasons for initial implementation and further expansion of shelf-ready services. Joy and Lugg point out that from a financial point of view, vendors did not significantly benefit by supplying shelf-ready materials.⁵ In fact, the provision of shelf-ready services acted as an added value in the competitive book market. Although libraries began to implement shelf-ready services mainly for budgetary reasons, it is interesting to note that the most recent case studies primarily cited the efficient use of human resources and the desire to improve user services as main reasons for the implementation of shelf-ready services.⁶ Moreover, Shippy and Krug observe that "shelf-ready acquisitions should not be regarded as a means of outsourcing or otherwise reducing staff. Rather, it is a means of freeing your most valuable asset—your staff—so they might better serve your library's users."⁷

Sweetland analyzed data on the number of libraries that used outsourcing for cataloging or physical processing more than a decade ago.⁸ However, his study published in 2001 cannot be used to estimate the expansion of shelf-ready services at the time because the definition of shelf-ready encompasses both cataloging and physical processing. Lam's survey of academic libraries reveals that the majority of outsourcing institutions were small- and medium-size libraries. Among that group, shelf-ready services were the most popular form of outsourcing.⁹ Regarding the format of shelf-ready materials, all reports to date address the processing of domestic print monographs, although one study indicates the desire to expand shelf-ready operations to music materials and foreign language monographs.¹⁰ In addition, a column in *Serials Review* by Andrade et al. describes the positive experiences of San Diego State University and the University of Calgary libraries in receiving shelf-ready print serials.¹¹ Furthermore, Baron briefly discusses the possibility of acquiring shelf-ready audiovisual and out-of-print monographs.¹² He concludes that the quality of bibliographic records and processing time, combined with high costs, were the impetus for moving to a shelf-ready acquisitions model for these types of library resources. Lastly, Jacoby expresses doubts regarding the future of shelf-ready services expansion in academic libraries because they eliminate or greatly reduce participation by librarians and faculty in the collection development process.¹³ However, one may argue that collection development librarians will still participate in the selection process by either defining the approval profile with the vendor or by placing preselected firm orders for shelf-ready materials. In addition, libraries usually use shelf-ready services only for part of their acquisitions.

The implementation of shelf-ready services requires collaboration and communication between vendors and libraries to define processing specifications. It also involves significant changes in the workflows for collection development, acquisitions, cataloging, end processing, and library systems staff. For example, acquisitions staff may spend less time processing traditional firm orders, copy catalogers and end processing staff may become available for reassignment to other functions, and collection development staff may become involved with loading bibliographic record sets and promoting the new shelf-ready books. Systems personnel may become engaged in the creation of new software to support the integration of local data into shelf-ready bibliographic records, approval profiling, invoicing, or writing scripts for batch processing of vendor records. Professional catalogers need to collaborate with vendors to provide quality assurance by identifying errors and reviewing records regularly.¹⁴ Libraries must also carefully examine vendor capabilities and limits of customization regarding local cataloging practices. Bierman and Carter suggested that to implement shelf-ready services, library approval plans must

have a very low return rate because shelf-ready materials may not be returned or exchanged.¹⁵

The benefits of shelf-ready services include improved materials turnaround time and financial savings. Various studies mention three to seven days as a range of time required to deliver materials to the shelf using this model.¹⁶ Schroeder and Howland conducted a cost-benefit analysis of in-house and shelf-ready materials processing at the University of Birmingham library.¹⁷ The study reveals that the shelf-ready books took 47 percent less processing time and were placed on the shelf thirty-three days sooner as compared to the materials processed in-house. In turn, Bierman and Carter calculated per-title cost for shelf-ready materials by combining vendor and OCLC charges with staff salaries and physical processing fees as \$6.85 per title. In contrast, the cost of per-title processing using a traditional model was \$8.70 in staff compensation including fringe benefits, OCLC and suppliers costs, direct cataloging costs and equipment. Consequently, the authors report that shelf-ready materials had a cost of \$2 less per title.¹⁸

The move to a shelf-ready model may affect libraries' infrastructure, resulting in the merging of different administrative units such as cataloging and acquisitions departments and additional duties for circulation services. For example, Bierman and Carter describe transferring the processing of shelf-ready titles from acquisitions to circulation staff to speed delivery of books to users. Later during the implementation process, the handling of shelf-ready materials was transferred to cataloging staff because about 25 percent of the bibliographic loads lacked Library of Congress (LC) full-level bibliographic records.¹⁹ Likewise, Walker and Kulczak report on acquisitions staff performing some copy cataloging duties while professional catalogers had to create technical specifications for shelf-ready materials. Because of these changes, two administrative units were consolidated into a single cataloging and acquisitions department.²⁰ Potential additional challenges of shelf-ready implementation may include changes to how cataloging statistics are recorded, possible duplicate items, and absence of OCLC control numbers (depending on the source of bibliographic records) for shelf-ready materials in the library database.²¹

Shelf-Ready Materials: Quality of Bibliographic Records

Sweetland reports the rate of errors in bibliographic records for shelf-ready materials observed in earlier studies.²² The data indicated that the error rate falls into a wide range between 0.5 and 30 percent. However, more recent studies document that records requiring in-house action at about 2 percent. According to Walker and Kulczak as well as Lam, such in-house actions may include correcting series

headings, call number errors, erroneous location codes, and typographical errors.²³ Likewise, Barron specifies that manual intervention was needed to modify Dewey call numbers for law materials.²⁴

The results of a survey of academic libraries conducted by Lam demonstrate that 81.1 percent of respondents exercised quality control of outsourced materials with the majority of institutions (48.94 percent) checking access points only. The remaining 20 percent of libraries checked all fields in the bibliographic records, 30 percent of respondents checked various combinations of access and non-access points such as call numbers, subject headings, typographical errors and non-English scripts. Moreover, 67 percent of the respondents stated that the quality of cataloging remained the same, and about 25 percent indicated that it increased because of outsourcing.²⁵

Walker and Kulczak were the first to specifically address the quality of shelf-ready materials cataloging.²⁶ They conducted a year-long review of cataloging records for materials received at the University of Arkansas Library. From their analysis of three samples of books totaling 400 titles, they observed that errors appeared in batches. Among the observed errors, 2 percent were related to mismatched titles or missing records, about 18 percent were national cataloging practices errors such as transcription, MARC coding, errors in name and subject headings and typographical mistakes, yet another 20 percent were local practices errors such as shelf listing and physical processing mistakes. Walker and Kulczak's study provides a comprehensive list of evaluation criteria. In addition to the records that contained errors in national and local cataloging practices, 32 percent of the records included series headings errors such as the wrong form of a series heading or series numbering. Series headings errors at a local level resulted from different tracing and classification practices. The authors conclude that a thorough review of shelf-ready materials is necessary to avoid compromising the integrity of the library's online catalog.

In contrast to Walker and Kulczak's findings, Lam's in-house survey of copy cataloging error rates before and after outsourcing establishes that the error rate for shelf-ready bibliographic records was very low and was comparable with materials copy cataloged in-house.²⁷ Likewise, Schroeder and Howland indicate that, although records cataloged locally were more in line with institutional standards, shelf-ready records were sufficient for their library's needs.²⁸ In an effort to streamline quality control for shelf-ready materials, the University of Florida library created an automation tool named CatQC.²⁹ According to Jay, Simpson, and Smith, CatQC is freely available to other institutions by directly contacting the authors. CatQC was designed to eliminate manual review of shelf-ready materials by conducting a cataloging quality report on nine parameters. These specifications were designed to identify minimal-level cataloging

records, foreign library records, serials, analytics, nonprint formats, untraced series, records requiring alternate titles, the presence of the URL linking to the electronic version of the item, and non-English subject headings.

Regarding physical processing errors, Ballestro reports errors in barcode placement and property stamps, poor placement of call number labels on the spine, and a mismatch of the call number in record and on label based on a sample of 2,734 titles.³⁰ He attributes these issues to quality control problems on the vendor's side. Sanchez surveyed academic, public, special and state libraries with regard to physical processing of shelf-ready materials.³¹ She found that spine labels were the most popular form of physical processing and that binding was the least in demand because of limited library budgets. Forty seven percent of the libraries that she surveyed employed quality control for shelf-ready materials. Among these, 64.7 percent checked for physical processing errors, 35.3 percent compared the book against the bibliographic record to correct description or access issues, and 52.9 percent compared books received against order information to assure that the correct titles were received. Incorrect or wrongly formatted call numbers were the most common problem reported by 76.9 percent of the respondents and physical processing errors were reported at the range of 0 to 3 percent. The most frequent physical errors included missing or incorrectly applied security tag, incorrectly formatted call numbers on spine labels, and incorrect placement of barcodes. Finally, it is not clear if or how shelf-ready operations influence a library's authority control practices because only Bierman and Carter briefly mention that authority work in their institution was not affected by shelf-ready services because it was done after cataloging.³²

Method

Research Questions and Conceptual Definitions

The purpose of this research was to assess how US academic libraries manage shelf-ready materials and to provide the library community with recent data on how the implementation of shelf-ready models may affect technical services departments. The study was guided by the following questions:

1. Why did academic libraries implement shelf-ready services and did they manage shelf-ready materials differently?
2. What is the quality of bibliographic records for shelf-ready materials?
3. Do shelf-ready materials affect local procedures and cataloging practices?
4. What is the level of satisfaction with shelf-ready services and what do academic librarians think of their future expansion in academic libraries?

The authors designed the survey with the intent to gather this information from academic institutions with varying collection sizes. The questions in the survey were based on the research questions mentioned above.

The authors used the following conceptual definitions:

- The definition of "technical services department" was based on the description of technical services provided by the ODLIS: Online Dictionary of Library and Information Science: "library operations concerned with the acquisitions, organization (bibliographic control), physical processing, and maintenance of library collections."³³ Conversely, for the purpose of this paper, "technical services department" was defined as a department where shelf-ready books were received or processed or both; it could be within acquisitions, cataloging, bindery/shelf preparation, or a combination of the above. Small libraries without technical services departments were referred to as "Library."
- "Shelf-ready materials" were defined as materials received from a vendor with full bibliographic records and some form of physical processing (e.g., barcodes, property stamps, spine labels, security devices, etc.).

Sample and Study Population

One of the main goals of the study was to investigate the differences in the management of shelf-ready materials by libraries of varying collection sizes. The selection of the study population presented a practical challenge because there was no readily available sample frame. There was not a single source of information listing all libraries with shelf-ready services from which the sample could be drawn. Therefore compiling the sample frame for the survey was a two-step process. First, the nonprobability purposive sample of four-year colleges was chosen from the Carnegie Foundation of Institutions of Higher Education (<http://classifications.carnegiefoundation.org>). The authors excluded two-year colleges from the study on the basis of data collected by Burke and Shorten.³⁴ Their study specified that among institutions of varying sizes, 88 percent of two-year colleges were doing almost all cataloging in-house. Additionally, the authors wanted to concentrate on a group of libraries that was close in characteristics to their own institutions. Columbia University is a large research academic institution while B. Davis Schwartz Memorial Library at Long Island University Post Campus (LIU Post) is a medium-size academic library.

A stratified sample of thirty institutions was randomly

chosen from all nine subgroups representing institutions of various sizes in the four-year colleges group. The authors used a random sample generator, Research Randomizer (www.randomizer.org), to select the sample. This strategy allowed the researchers to avoid self-selection of the survey respondents and to reach out to a diverse number of libraries of different collection sizes. The final sample frame consisted of a stratified random sample of 270 US academic libraries.

Survey Instrument and Distribution

Each library's website was accessed to collect email addresses for the individuals who were likely to be responsible for the management of shelf-ready materials. Each identified person received an email with an invitation to participate in the survey, an explanation of the research goal, and a link to an online survey form created via SurveyMonkey (www.surveymonkey.com), a web-based survey tool. The survey study population consisted of the heads of technical services departments, and technical services librarians including catalogers, acquisitions librarians, and other library practitioners directly involved in the management of shelf-ready materials. The email also asked recipients to forward the survey invitation to the appropriate personnel in their library if needed. A follow-up email with a reminder to participate in the survey was sent one week before the survey's closing date. The survey instrument comprised thirty-one questions (see appendix A) that addressed the demographic characteristics of the respondents and their libraries, the library's experience with shelf-ready materials management, quality of the bibliographic records, and evaluation of shelf-ready services. The survey questions were reviewed by three library administrators with cataloging or shelf-ready materials management experience from the authors' home institutions. The questions were multiple choice and in a closed-end format. Some of the multiple-choice questions provided an option for a free-text response. Several questions used skip logic that allowed the respondents to bypass questions depending on their answers. The participants did not have to answer all the questions, no incentives to complete the survey were offered, and no information that could identify the respondents was collected. The survey instrument was vetted through the LIU Post and Columbia University Institutional Review Boards and was exempt from review by both reviewing bodies.

Data Analysis

The survey was open from January 24-February 24, 2013. A total of forty-five replies were received. While the survey recruitment email aimed to convey the idea that the survey was geared toward libraries that had already implemented

shelf-ready services, the data analysis revealed that among forty-five respondents, only twenty-seven libraries represented the targeted population (i.e., libraries that have implemented shelf-ready procedures) and fully completed the survey. The remaining eighteen respondents were from libraries that had only partially completed the survey and did not have shelf-ready procedures in place. They were eliminated from the poll of respondents. Not all respondents answered every question and the answers to some questions were not mutually exclusive. Consequently, the total number of responses may be less or greater than the total number of valid survey responses. The authors analyzed the free text replies submitted under the "other, please specify" option and collapsed the replies under existing categories when appropriate. The collected data were analyzed using the SPSS version 21 statistical software package. Although the use of stratified random sampling in this study carries great statistical validity by reducing sampling bias, the low response rate (10 percent) makes this study exploratory in nature. The resulting data should be discussed only regarding the type of library chosen.

Survey Analysis and Discussion

A total of twenty-seven valid responses were analyzed. The survey participants represented libraries of all sizes, with the majority working in either medium (ten or 37 percent) or small (eleven or 40.7 percent) size institutions. Large libraries were in the minority with six (22.2 percent) of respondents. Although the authors did not form a hypothesis regarding acceptance of shelf-ready services by a particular library size group, the latter finding may be indicative of the dissemination of shelf-ready services among institutions of different sizes. The survey reached its target audience with the majority of responses provided by either technical services librarians in management positions or other library administrators. The department heads made up the largest group (seventeen or 63.3 percent) of the respondents. In addition, two (7.4 percent) respondents had the job title "library director," and five (18.5 percent) were professional librarians or catalogers. The job titles of the remaining three survey participants included one bibliographic manager, one head of cataloging, and one cataloging unit head.

Regarding the number of the professional librarians, the majority (thirteen or 48 percent) of the responding institutions had four to seven professional librarians on staff. This group was composed of three large libraries, seven medium libraries and three small libraries. Only one large library had more than eleven professional librarians and a group of eight small libraries had fewer than three professionals working in technical services.

In relation to support staff, the majority of the respondents (ten of all libraries surveyed) reported employing

Table 1. Reasons Cited for Shelf-Ready Implementation

Motive	Library Size (No./%)			
	Large	Medium	Small	Total across all
To reduce cost by downsizing technical services department	3 (50.0%)	4 (40.0%)	1 (9.1%)	8 (29.6%)
To decrease workload of subject specialists	1 (16.7%)	0 (0.0%)	1 (9.2%)	2 (7.4%)
To improve material turnaround time	6 (100.0%)	8 (80.0%)	9 (81.8%)	23 (85.2%)
To redeploy staff for emerging priorities	4 (66.7%)	8 (80.0%)	7 (63.6%)	19 (70.4%)
Other	0 (0.0%)	0 (0.0%)	1 (9.1%)	1 (3.7%)

between one to four paraprofessional staff. However, this group largely comprised the small libraries (nine or 81.8 percent). Large libraries predictably reported the biggest number of support staff with the majority (four or 66.7 percent) employing more than twenty support staff. The distribution of support staff in the medium-size libraries group varied widely. Half of the responding medium-size libraries (five or 50 percent) reported employing eleven to twenty support staff and the remaining half (five or 50 percent) reported employing five to ten support staff. Summary data on the survey demographics are presented in appendix B.

The first research question of the study related to the reasons for implementing shelf-ready services and the differences in the management of shelf-ready services at libraries of various sizes. The survey analysis revealed that the two main reasons for implementing shelf-ready services for libraries of all sizes were (1) the need to reduce materials turnaround time (twenty-three or 85.2 percent of all libraries) and (2) the desire to redeploy staff for other projects or emerging areas of need (nineteen or 70.4 percent of all libraries). Therefore shelf-ready services were viewed by libraries as an efficiency rather than a cost-cutting measure. Table 1 summarizes the reasons for the shelf-ready services implementation among libraries with varying collection sizes. Although the need to reduce cost by downsizing technical services departments was reported as a reason for shelf-ready implementation by almost one-third of the respondents (eight or 29.6 percent), the findings of this study support the focus on user satisfaction reported in previous research as the main driving force behind shelf-ready implementation.³⁵ One small library specified that shelf-ready was implemented to ensure better preservation of library materials.

As to initial objections to shelf-ready implementation, survey respondents were divided roughly evenly between those who encountered objections (thirteen or 48.1 percent) and those who did not (fourteen or 51.9 percent). The two most common objections cited by all libraries were cost (seven or 25.9 percent of libraries) and quality of bibliographic records supplied (eight or 30 percent of libraries). Concern regarding the cost of shelf-ready services was

somewhat surprising because, based on reasons for implementation described in the previous paragraph, cost should not have been one of the prevailing factors. However, the survey revealed that the predominant nature of objections varied along with the libraries' size. While medium (four or 40 percent) and small (two or 18.2 percent) academic libraries were mostly concerned with the cost and quality of vendor-supplied bibliographic records, the main objection of the large libraries group (three or 50 percent) was on collection development control over shelf-ready materials. This was manifested in the subject specialists' desire to make book-by-book retention decisions. One might also argue that the subject specialists' time may be freed by employing shelf-ready services, thereby allowing them to pursue more challenging areas of collection development.

Only one library indicated the possible loss of staff positions as an objection to the shelf-ready implementation. In sum, the group of small libraries had the least number of objections compared to medium and large libraries. This could be explained by the fact that small libraries have fewer resources to invest in the in-house cataloging and processing of materials, making this group of libraries more open to the shelf-ready implementation. Table 2 summarizes data on initial objection to shelf-ready implementation.

The majority of responding institutions (eleven or 40.7 percent) had two to five years of experience using shelf-ready services. Libraries that had received shelf-ready materials for less than one year were in the minority (three or 11.1 percent). The survey data also indicated that the length of the individual libraries' experience with shelf-ready seemed dependent on library size. The majority of large libraries had received shelf-ready materials for more than ten years (three or 50 percent). In the medium libraries category, the majority had received shelf-ready for six to nine years (four or 40 percent). Most small libraries (six or 54.5 percent) received shelf-ready materials for two to five years. Large and medium libraries gradually integrated shelf-ready processes into their operations over the course of the last decade. In contrast, small libraries had more recent implementations of shelf-ready services.

Regarding budget, it was common for the majority of

Table 2. Objections to Shelf-Ready Services Implementation

Nature of Objection	Library Size (No./%)			
	Large	Medium	Small	Total across all
Perception that shelf ready services result in delay in receiving materials	0 (0.0%)	1 (10.0%)	0 (0.0%)	1 (3.7%)
Shelf ready services perceived as more expensive	1 (16.7%)	4 (40.0%)	2 (18.2%)	7 (25.9%)
Perception that materials supplied are out of scope or not scholarly	1 (16.7%)	1 (10.0%)	0 (0.0%)	2 (7.4%)
Subject specialist wants to make book by book retention decisions	3 (50.0%)	0 (0.0%)	0 (0.0%)	3 (11.1%)
Other reasons:				
Quality of cataloging records	2 (33.4%)	4 (40.0%)	2 (18.2%)	8 (30.0%)
Loss of staff positions	0 (0.0%)	0 (0.0%)	1 (9.1%)	1 (3.7%)

Table 3. Changes in Cataloging Staff Level (*N* = 26)

Libraries/Size	Cataloging Staff Decreased		Percentage of Decrease			
	Yes	No	50%+	30%–50%	10%–29%	Less than 10%
Large	1 (20.0%)	4 (80.0%)	0 (0.0%)	0 (0.0%)	1 (16.7%)	0 (0.0%)
Medium	6 (60.0%)	4 (40.0%)	1 (20.0%)	1 (20.0%)	3 (60.0%)	0 (0.0%)
Small	3 (27.3%)	8 (72.7%)	1 (9.1%)	0 (0.0%)	2 (18.2%)	0 (0.0%)
Total across all library groups	10 (38.5%)	16 (61.5%)	2 (22.2%)	1 (11.1%)	6 (66.7%)	0 (0.0%)

libraries (fifteen or 68.2 percent) to use fewer than 5 percent of their acquisitions budget for shelf-ready services, with some medium and large libraries spending between 5 and 10 percent. It would be difficult to find an exact correlation between the percentage of the acquisitions budget used and the volume of shelf-ready materials received for large and medium institutions. The majority of large libraries (four or 66.7 percent) received 10,000–20,000 shelf-ready items annually. Among medium libraries, the two groups receiving 20,000+ (three or 33.3 percent) and 5,000–10,000 (three or 33.3 percent) were most prevalent. An overwhelming majority (ten or 90.9 percent) of small libraries received fewer than 5,000 shelf-ready items annually. The surprising finding regarding shelf-ready budgets was that some medium-size libraries received the largest amount (more than 20,000 items) of shelf-ready materials while the percentage of the acquisitions budget for shelf-ready services in medium and large libraries was similar. This may be explained by a decrease in cataloging and processing resources in some medium libraries and the resulting acquisitions of larger amounts of shelf-ready materials. Consequently, medium libraries may be able to negotiate better prices with shelf-ready vendors on the basis of the amount of the materials received.

Overall, ten libraries (38.5 percent) reported a decrease in cataloging staff compared to sixteen libraries (61.5 percent) where cataloging staffing levels remained the same. Among those who reported a decrease, the majority (six or 66.7 percent) reported a 10–29 percent decline in cataloging

staff. Furthermore, shelf-ready services did not seem to significantly affect technical services staffing in large and small libraries. More than a half of medium libraries (six or 60 percent), however, reported a decrease in technical services personnel ranging from ten to fifty percent. Table 3 shows staff level changes as a result of shelf-ready implementation.

All twenty-seven libraries (100 percent) that responded to the survey reported that they receive shelf-ready print domestic monographs. Furthermore, seven (25.9 percent) received monographs from foreign vendors. Print monographs were also the largest category across all library sizes with only two libraries (7.4 percent) receiving shelf-ready serials. In contrast, nonprint materials (i.e., CDs and DVDs) were received by only one medium and one small library (7.4 percent of respondents). Although nonprint media are usually considered more difficult to catalog and process in-house, the small number of libraries that chose to outsource this type of cataloging and physical processing may indicate the problems with bibliographic records quality as indicated in previous research.³⁶ Across all library sizes, the categories excluded most commonly from shelf-ready services were rush materials (seventeen or 63 percent of all libraries) and added volumes (twelve or 44.4 percent of all libraries). The exclusion of the added volume category by most libraries may indicate problems with record loads and a need to monitor multivolume records and related processing more closely. To properly add an additional volume to an existing bibliographic record, libraries must develop procedures to correctly merge bibliographic records for initial and

Table 4. Percentage of Materials Undergoing Quality Control ($N = 20$)

% of Materials	Library Size (No./%)			
	Large	Medium	Small	Total across all
All materials	1 (25.0%)	2 (25.0%)	3 (37.5%)	6 (30.0%)
10% of materials	0 (0.0%)	2 (25.0%)	1 (12.5%)	3 (15.0%)
5%-9% of materials	1 (25.0%)	3 (37.5%)	0 (0.0%)	4 (20.0%)
Less than 5% of materials	2 (50.0%)	1 (12.5%)	4 (50.0%)	7 (35.0%)

consecutive volumes because each volume of shelf-ready multivolume work is typically received with its own bibliographic record.

The survey revealed that shelf-ready outsourcing constitutes a good example of a patron-oriented service model. Most libraries implemented shelf-ready services with the intent to enhance access to library resources to better serve users, and to free up staff to tackle new challenges. This form of outsourcing does not necessarily entail the reduction of technical services staff. Shelf-ready services involve mostly print monographs and serials and the type of materials excluded from this category is similar regardless of the library's size (see "Types of Shelf Ready Materials Received" table in appendix B). Likewise, libraries use similar financial approaches to budgeting for shelf-ready services. In sum, the collected data suggests that libraries of all sizes exercise a similar approach to their shelf-ready processing and the differences in management are insignificant. A summary of the shelf-ready services duration, cost, volume as well as type of materials received and excluded is included in appendix B.

The second research question pertained to the quality of bibliographic records received with shelf-ready services. Quality control applied to received materials was important for an overwhelming majority (95.8 percent) of libraries. Virtually all institutions performed some form of bibliographic and physical processing review. Large and medium libraries mostly relied on support staff (66 and 90 percent respectively) to perform quality control with some input from professional librarians, whereas small libraries equally involved both professionals and support staff (45.5 and 54.5 percent respectively). Thus the survey results suggest that shelf-ready processing is a good redeployment of support staff within the technical services departments of academic libraries.

The majority of responding libraries (fifteen or 68.2 percent) performed quality control of shelf-ready materials as an ongoing activity. This was true across all library categories with 100 percent of large, 66.7 percent of medium, and 55.6 percent of small libraries adhering to this practice. It is interesting to note that while large and medium libraries mostly performed quality control as an ongoing activity, small libraries demonstrated a wide range of practices (from

the first year only to an ongoing activity). Perhaps this may be explained by the fact that small libraries implemented shelf-ready services relatively recently compared to the rest of the group and continue to investigate different models of quality control procedures. Table 4 reveals data on individual libraries' approaches to the percentage of shelf-ready material that is subject to quality control. There was no consistency between survey respondents regarding the percentage of the materials examined: the numbers varied between inspecting 100 percent of shelf-ready materials received to fewer than 5 percent.

Table 5 reports on physical processing errors encountered by the survey participants. The majority of physical processing errors were related to spine label mistakes (twelve or 44.4 percent of all libraries) followed by errors related to barcode placement, security tag, or property stamp errors (nine or 33.3 percent of all libraries). Two libraries (7.4 percent) reported an absence of physical processing mistakes. Table 6 reports on cataloging errors. The major cataloging error noted by libraries of all sizes was the absence of a call number in the bibliographic record (seventeen or 63 percent of all libraries). Access point errors constituted the smallest group, as reported by 14.8 percent of all libraries, and were noticed only by medium-size libraries. The percentage of other types of cataloging errors was significantly smaller, and the types of errors were fairly equally distributed across libraries of various collection sizes.

The reported error rate for combined cataloging and physical processing mistakes was insignificant. The majority of libraries (fifteen or 55.6 percent) estimated a 0–3 percent cataloging and physical processing error rate in their shelf-ready workflow. This was true for libraries of all sizes. Table 7 reports error rate and areas of concern. Although the percentages of examined materials varied, libraries of all sizes were predominantly concerned with bibliographic errors and mistakes in record loads (twelve or 57.2 percent of all libraries). Shipments, invoices, and profiles generated the least amount of errors (two or 9.5 percent of libraries). Another category (two or 9.5 percent of libraries) included "defects in books not being caught by a vendor" and "OCLC unable to supply record." As previously mentioned, most libraries reported less than 3 percent error rate, and this

Table 5. Physical Processing Errors ($N = 22$)

Error Type	Library Size (No./%)			
	Large	Medium	Small	Total across all
Spine label mistakes (call number, location, volume number)	3 (50.0%)	6 (60.0%)	3 (27.3%)	12 (44.4%)
Barcode, security tag or stamp errors (missing, incorrectly applied)	3 (50.0%)	4 (40.0%)	2 (18.2%)	9 (33.3%)
None	1 (10.0%)	0 (0.0%)	1 (10.0%)	2 (7.4%)

Table 6. Cataloging Errors ($N = 22$)

Error Type	Library Size (No./%)			
	Large	Medium	Small	Total across all
Bibliographic record load problems	2 (33.3%)	3 (30.0%)	2 (18.2%)	7 (25.9%)
Incomplete CIPs	1 (16.7%)	5 (50.0%)	4 (36.4%)	10 (37.0%)
Non-standard records supplied	1 (16.7%)	4 (40.0%)	2 (18.2%)	7 (25.9%)
Access point errors	0 (0.0%)	4 (40.0%)	0 (0.0%)	4 (14.8%)
No call number in the record therefore, no spine label	3 (50.0%)	7 (70.0%)	7 (49.7%)	17 (63%)

number is consistent with the error rate recorded by Sanchez in her 2011 shelf-ready study.³⁷ The survey data also confirms previous findings reported in Lam's and Schroeder and Howland's case studies regarding a very low rate of bibliographic record errors in shelf-ready materials.³⁸ Although the quality of bibliographic records presented a major objection to implementing shelf-ready services in libraries of all sizes, the findings of this study prove that once shelf-ready services were implemented, record quality concerns were alleviated. Detailed data on staff involvement, years of experience, percentage of materials undergoing quality control as part of the shelf-ready services are provided in appendix B.

The third research question addressed the effect of shelf-ready services on local procedures and cataloging practices. More than half the libraries (fourteen or 60.9 percent) reported that their in-house cataloging practices were affected by shelf-ready services. Among the libraries of various collection sizes, the medium-size libraries group (eight or 88.9 percent) was the most likely to modify or abandon some of their cataloging workflows. Perhaps these findings are related to the fact that medium libraries proved to be the largest consumer of shelf-ready records and therefore statistically experienced the greatest effect on their local workflows. The number of respondents who indicated that cataloging practices were affected was relatively close to the number of libraries which did not experience any changes in cataloging practices (nine or 39.1 percent). This may be explained by the fact that libraries take a different approach when it comes to database maintenance practices and have different amounts of available shelf space. As a result, some institutions are ready to allow for greater deviations in shelf listing and are more willing to accept records that do not

conform precisely to their local practices. Yet others prefer to exercise stricter control and therefore need to modify local practices to accommodate shelf-ready materials. The majority of libraries modified, rather than abandoned, their local cataloging practices because of shelf-ready services.

The survey results demonstrated that shelf-ready services did not affect the way authority control was performed in the majority (95.5 percent) of libraries. The authors assumed that most libraries perform authority control in-house or use authority control vendors post-cataloging. All twenty-three libraries that answered the question about the possible effect of RDA on technical specifications for shelf-ready services responded that the increased number of RDA records would not affect shelf-ready specifications. Perhaps it is safe to speculate that many libraries have already adjusted bibliographic load tables in their integrated library systems in anticipation of RDA implementation. As the adoption of RDA expands, libraries receiving shelf-ready bibliographic records might need to work with vendors on technical specifications related to the specific RDA elements such as content, media, and carrier.

The intent of the fourth research question was to assess the level of satisfaction with shelf-ready services and the future of this outsourcing model in academic libraries. The survey data confirmed that most categories of libraries were satisfied with the shelf-ready services they receive. Half (eleven or 50 percent) of respondents chose "very satisfied" as the answer, and a little less than one-third (six or 27.3 percent) indicated that they were satisfied with the services. Libraries that were moderately or not satisfied were in the minority (11.1 and 9.1 percent, respectively). The majority of libraries from the latter category were either small or

Table 7. Error Rate and Areas of Concern ($N = 22$)

Error Rate	Library Size (No./%)			
	Large	Medium	Small	Total across all
0-3%	4 (66.7%)	5 (50.0%)	6 (54.5%)	15 (55.6%)
4-6%	0 (0.0%)	2 (20.0%)	0 (0.0%)	2 (7.4%)
7-10%	0 (0.0%)	1 (10.0%)	2 (18.2%)	3 (11.1%)
11-15%	0 (0.0%)	0 (0.0%)	1 (9.1%)	1 (3.7%)
15% +	0 (0.0%)	1 (10.0%)	0 (0.0%)	1 (3.7%)
Area of Concern:				
Bibliographic records and loads	1 (25.0%)	5 (55.6%)	6 (75.0%)	12 (57.2%)
Physical processing (barcoding, labeling, etc.)	2 (50.0%)	3 (33.3%)	2 (25.0%)	7 (33.3%)
Shipment, invoices, profiles	1 (25.0%)	1 (11.1%)	0 (0.0%)	2 (9.5%)
Other:				
OCLC unable to supply record	0 (0.0%)	0 (0.0%)	1 (9.1%)	1 (3.7%)
Books defects not caught by vendor	0 (0.0%)	0 (0.0%)	2 (25.0%)	2 (9.5%)

medium institutions. The medium group could have experienced the most problems with shelf-ready implementation because they were the largest group participating in the survey.

The positive feedback on the quality of the shelf-ready services was received mostly from technical services personnel (seventeen or 63 percent of respondents). Public services librarians provided feedback from nine (33.3 percent) of the surveyed institutions, and user feedback was cited by seven (25.9 percent) libraries. Predictably, the majority of the feedback was provided by technical services staff. Perhaps, with the support of library administration, the assessment of the shelf-ready services efficiencies may further involve public services staff and patrons. Although the majority of libraries expressed satisfaction with shelf-ready services, the survey participants were less positive regarding the possible expansion of this service at their institutions. A little less than half of the libraries strongly agreed (six or 27.3 percent) or agreed (four or 18.2 percent) with the statement that future expansion of shelf-ready services in their institutions would possibly include new vendors and new categories of materials. However, more libraries disagreed (four or 18.2 percent), strongly disagreed (one or 4.5 percent), or had no definitive response (seven or 31.8 percent) to this statement. Therefore the survey failed to predict the future expansion of shelf-ready services in academic libraries. Perhaps further development of shelf-ready services by vendors might change this uncertain outlook.

Conclusion

The survey provided an overview of the implementation,

management, and evaluation of shelf-ready services in academic libraries. The main reasons for shelf-ready implementation across libraries of all sizes were the need to improve materials turnaround time and the desire to redeploy staff for other projects or tasks. An additional efficiency is gained by the fact that shelf-ready materials bibliographic records have a very low error rate. The survey results also demonstrated that the academic library community is focused not only on the timely processing of print materials but also on the quality of the shelf-ready physical processing. Bibliographic control remains a valid concern. The survey results confirmed that shelf-ready services have not been affected by the implementation of RDA and authority work now. The results of the survey may assist library administrators in making informed decisions regarding the implementation of shelf-ready services at their institutions and the possible implications of these services for database quality and staff management. The survey data may also encourage libraries to reevaluate existing procedures and inspire new approaches to processing of print materials in US academic libraries. The authors plan to focus their future research on more specialized aspects of shelf-ready services such as foreign vendors' capabilities to provide shelf-ready services according to US libraries' specifications.

References

1. Albert H. Joy and Rick Lugg, "The Books Are Shelf-Ready; Are You?," *Library Acquisitions* 22, no. 1 (1998): 71-89; Mary Walker and Deb Kulczak, "Shelf-ready Books Using Prompt-Cat and YBP: Issues to Consider (An Analysis of Errors at the University of Arkansas)," *Library Collections, Acquisitions, & Technical Services* 31, no. 2 (2007): 61-84; Vinh-The Lam,

- "Quality Control Issues in Outsourcing Cataloging in United States and Canadian Academic Libraries," *Cataloging & Classification Quarterly* 40, no. 1 (2005): 101–22.
2. James H. Sweetland, "Outsourcing Library Technical Services—What We Think We Know, and Don't Know," *Bottom Line: Managing Library Finances* 14, no. 3 (2001): 169.
 3. Sarah Shippy and Emily Krug, "Transforming Technical Services: Are You Ready to Go 'Shelf-Ready?'" *Tennessee Libraries* 62, no. 2 (2012), accessed December 2, 2012, <http://tnla.org/displaycommon.cfm?an=1&subarticlenbr=484>.
 4. Joy and Lugg, "The Books Are Shelf-Ready; Are You?" 73.
 5. *Ibid.*, 76.
 6. Vihn-The Lam, "Quality Control Issues in Outsourcing Cataloging," 105; John Ballestro, "Losing Your Control: Acquisitions and Outsourcing," *Technical Services Quarterly* 29, no. 2 (2012): 120; Shippy and Krug, "Transforming Technical Services"; Kenneth J. Bierman and Judith A. Carter, "Outsourcing Monograph Cataloging at the UNLV Libraries," *Technical Services Quarterly* 25, no. 3 (2008): 50.
 7. Shippy and Krug, "Transforming Technical Services."
 8. Sweetland, "Outsourcing Library Technical Services," 170–72.
 9. Vihn-The Lam, "Quality Control Issues in Outsourcing Cataloging," 106.
 10. Bierman and Carter, "Outsourcing Monograph Cataloging," 64.
 11. José Luis Andrade et al., "'Shelf-Ready' Print Serials Acquisitions," *Serials Review* 37, no. 1 (2011): 29–34.
 12. David Baron, "Shelf Ready Processing at Leeds Metropolitan University," *Catalogue & Index* no. 166 (2012): 2–4.
 13. Beth E. Jacoby, "Status of Approval Plans in College Libraries," *College & Research Libraries* 69, no. 3 (2008): 227–40.
 14. Joy and Lugg, "The Books Are Shelf-Ready," 78–79.
 15. Bierman and Carter, "Outsourcing Monograph Cataloging," 51.
 16. Sweetland, "Outsourcing Library Technical Services," 170; Bierman and Carter, "Outsourcing Monograph Cataloging," 62; David Baron, "Shelf Ready Processing at Leeds Metropolitan University," *Catalogue & Index*, no. 166 (2012): 4.
 17. Rebecca Schroeder and Jared L. Howland, "Shelf-Ready: A Cost-Benefit Analysis," *Library Collections, Acquisitions & Technical Services* 35, no. 4 (2011): 129–34.
 18. Bierman and Carter, "Outsourcing Monograph Cataloging," 61.
 19. *Ibid.*, 56.
 20. Walker and Kulczak, "Shelf-ready Books," 63.
 21. Bierman and Carter, "Outsourcing Monograph Cataloging," 63.
 22. Sweetland, "Outsourcing Library Technical Services," 170–172.
 23. Walker and Kulczak, "Shelf-Ready Books," 80–81; Vinh-The Lam, "Error Rates in Monograph Copy Cataloging Bibliographic Records Before and After Outsourcing at the University of Saskatchewan Library," *Cataloging & Classification Quarterly* 44, no. 3/4 (2007): 213–20.
 24. Baron, "Shelf Ready Processing," 4.
 25. Vinh-The Lam, "Quality Control Issues in Outsourcing Cataloging," 109–11.
 26. Walker and Kulczak, "Shelf-Ready Books," 62.
 27. Vinh-The Lam, "Error Rates in Monograph Copy Cataloging," 220.
 28. Schroeder and Howland, "Shelf-Ready," 133.
 29. Michael Jay, Betsy Simpson, and Doug Smith, "CatQC and Shelf-Ready Material: Speeding Collections to Users While Preserving Data Quality," *Information Technology & Libraries* 28, no. 1 (2009): 41–48.
 30. Ballestro, "Losing Your Control," 116–17.
 31. Elaine Sanchez, email to Autocat discussion list, November 16, 2011.
 32. Bierman and Carter, "Outsourcing Monograph Cataloging," 60.
 33. ODLIS: Online Dictionary of Library and Information Science, s.v. "technical services," accessed November 11, 2013, www.library.ucsb.edu/research/db/1182.
 34. Susan K. Burke and Jay Shorten, "Name Authority Work Today: A Comparison of Types of Academic Libraries," *Library Resources & Technical Services* 54, no. 1(2010): 4–20.
 35. Vihn-The Lam, "Quality Control Issues in Outsourcing Cataloging," 105; Ballestro, "Losing Your Control," 120; Bierman and Carter, "Outsourcing Monograph Cataloging," 50.
 36. Baron, "Shelf Ready Processing," 4.
 37. Sanchez, email to Autocat discussion list.
 38. Vihn-The Lam, "Quality Control Issues in Outsourcing Cataloging," 114; Schroeder and Howland, "Shelf-Ready," 133.

Appendix A. Ready or Not? An Assessment of Shelf-Ready Materials Management Practices in US Academic Libraries

Survey Questions

Survey terminology: Technical Services department is a department where shelf ready books are received and (or) processed; it could be the Acquisitions, Cataloging, or Bindery/Shelf Preparation department or a combination of the above. Small libraries without Technical Services Departments are referred to as “Library.” Shelf ready materials are defined as materials received from a vendor with cataloged records and with at least some physical processing (e.g., barcodes, property stamps, spine labels, security devices, etc.).

1. To which category does your Library belong?
 - Large (more than 6 million volumes in Library)
 - Medium (2–6 million volumes in Library)
 - Small (less than 2 million volumes in Library)
2. What is your position within Technical Services Department/Library?
 - Director
 - Head of department
 - Professional librarian/Cataloger
 - Other (Please specify)
3. How many professional librarians does your Technical Services Department/Library have?
 - More than 11
 - 8–10
 - 4–7
 - Less than 3
4. How many library assistants/library technicians does your Technical Services Department/Library have?
 - More than 20
 - 11–20
 - 5–10
 - 4–1
 - None
5. Why did your Library implement shelf ready services? (select all that apply)
 - To reduce cost by downsizing Technical Services Department
 - To decrease workload of subject specialists
 - To improve materials turnaround time
 - To redeploy staff for emerging priorities
 - Other (Please specify)
6. Were there any initial objections into the implementation of shelf ready services in your Library? (contingency question, participants that replied “yes” are directed to Q.7., otherwise skip to Q8)
 - No
 - Yes
7. Please indicate the nature of initial objections (select all that apply)
 - Perception that shelf-ready services result a delay in receiving materials
 - Shelf-ready services were perceived as more expensive than in-house processing and labeling
 - There was a concern that shelf-ready services negatively affect ILL lending and patron requests
 - Perception that material supplied is out of scope or not scholarly
 - Subject specialists want to make book by book retention and shelving decisions
 - Other (please specify)
8. For how many years has your Library been receiving shelf ready materials?
 - More than 10 years
 - 6–9 years
 - 2–5 years
 - Less than 1 year
9. What type of materials does your Library receive shelf ready? (select all that apply)
 - Print (domestic vendors)
 - Print (foreign vendors)
 - Serials
 - DVDs
 - CDs
 - Other (Please specify)
10. What kind of materials are excluded from shelf ready services in your library? (select all that apply)
 - Added volumes
 - Oversize
 - Rush materials
 - Certain library locations (e.g. reference)
 - Other (please specify)
11. What is the volume of the shelf ready supplied materials?
 - More than 20,000 items/year
 - 10,000–20,000 items/year
 - 5,000–10,000 items/year
 - Less than 5,000 items/year
12. Has your cataloguing staffing level decreased as a result of shelf ready? (contingency question, participants answering “yes” are redirected to Q13, otherwise skip to Q14)
 - Yes
 - No

13. What is the percentage of decrease?
 - More than 50%
 - 30%–50%
 - 10%–29%
 - Less than 10%
14. What is your cost for shelf ready services?
 - More than 20% of acquisitions budget
 - 11%–20% of acquisitions budget
 - 5%–10% of acquisitions budget
 - Less than 5% of acquisitions budget
15. Has your institution ever performed quality control of shelf ready materials? (participants answering “no” are redirected to Q23)
 - Yes
 - No
16. How long did you perform quality control of shelf ready materials?
 - First 6 months
 - First year
 - First two years
 - As an ongoing activity within the Technical Services Department
17. What level of staff are involved in the quality control program? (select all that apply)
 - Librarians
 - Library assistants/technicians
18. On what percentage of materials do you perform quality control?
 - All materials
 - 10% of materials
 - 5%–9% of materials
 - Less than 5% of materials
 - Other (Please specify)
19. What kinds of physical processing errors have you encountered? (select all that apply)
 - Spine label mistakes (call number, location, volume number(s))
 - Barcode, security tag or stamp errors (missing, incorrectly applied)
 - Other (please specify)
20. What kinds of cataloging errors have you encountered? (select all that apply)
 - Bibliographic record load problems
 - Incomplete CIPs
 - Non-standard records supplied
 - Access point errors
 - No call number in the record (therefore, no spine label either)
 - Other (please specify)
21. To date, what has been the overall rate of all errors (bibliographic and physical processing)?
 - 0–3 percent
 - 4–6 percent
 - 7–10 percent
 - 11–15%
 - More than 15%
22. The majority of errors are related to:
 - Bibliographic records and loads
 - Physical processing (barcoding, labeling, etc.)
 - Shipment, invoices, and profiles
 - Other
23. Have your local cataloging practices been affected by shelf ready? (contingency question, participants answering “yes” are directed to Q24, otherwise skip to Q25)
 - No
 - Yes
24. How the local cataloging / processing practices were affected?
 - Library had to modify certain in-house practices to accommodate shelf ready
 - Library had to abandon certain in-house practices to accommodate shelf ready
 - Other
25. Have the shelf ready services affected authority control processes in your Library? (contingency question, participants answering “yes” are redirected to Q26, otherwise skip to Q27)
 - No
 - Yes
26. Please briefly describe how the authority control processing was affected
27. Does the increased number of RDA records affect (or will affect) the technical specifications for your shelf ready vendor? (contingency question, participants answering “yes” are directed to Q28, otherwise skip to Q29)
 - No
 - Yes
28. Please briefly describe the changes in specifications.
29. Please rate the level of satisfaction with shelf ready services:
 - Very satisfied
 - Satisfied
 - Moderately satisfied
 - Not satisfied

30. Is your perception of the success or failure of the shelf ready services based on feedback from the following groups (select all that apply)
- Users
 - Public Services staff
 - Technical Services staff
 - Others (please specify)
31. Please rank the following statement: “My Library is planning to expand shelf ready services in the future (possibly including new vendors and new categories of materials)”
- Agree
 - Strongly agree
 - Disagree
 - Strongly disagree
 - Don't know

Appendix B

I. Distribution of Professional Staff in Respondents Institutions

Type of Library	Professional Staff Range (No. / %)			
	11+	8-10	4-7	< 3
Large (more than 6 million volumes in Library)	1 (16.7%)	1 (16.7%)	3 (50%)	1 (16.7%)
Medium (2-6 million volumes in Library)	0 (0.0%)	1 (10%)	7 (70%)	2 (20%)
Small (less than 2 million volumes in Library)	0 (0.0%)	0 (0.0%)	3 (27.3%)	8 (72.7%)
Total % across all groups	1 (3.7%)	2 (7.4%)	13 (48.1%)	11 (40.7%)

II. Distribution of Paraprofessional Staff in Respondents Institutions

Type of Library	Professional Staff Range (No. / %)			
	20+	11-20	5-10	4-1
Large (more than 6 million volumes)	4 (66.7%)	1 (16.7%)	0	1 (16.7%)
Medium (2-6 million volumes)	0 (0.0%)	5 (50%)	5 (50%)	0 (0.0%)
Small (less than 2 million volumes)	0 (0.0%)	1 (9.1%)	1 (9.1%)	9 (81.8%)
Total % across all groups	4	7	6	10

III. Years Receiving Shelf-Ready Materials

Library Size	Range of Years Receiving Shelf Ready Services			
	10+	6-9	2-5	< 1 year
Large	3 (50%)	1 (16.7%)	2 (33.3%)	0 (0.0%)
Medium	3 (50%)	4 (40%)	3 (30%)	0 (0.0%)
Small	0 (0.0%)	2 (18.2%)	6 (54.5%)	3 (27.3%)
Total across all groups	6 (22.2%)	7 (25.9%)	11 (40.7%)	3 (11.1%)

IV. Shelf-Ready Materials Cost (Answered by 22 libraries)

Acquisitions Budget	Library Size (No. / %)			
	Large	Medium	Small	Total for all
20% +	0 (0.0%)	1 (14.3%)	1 (10%)	2 (9.1%)
11%-20%	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
5%-10%	2 (40%)	3 (42.9%)	0 (0.0%)	5 (22.7%)
Less than 5%	3 (60%)	3 (42.9%)	9 (90%)	15 (68.2%)

V. Volume of Shelf-Ready Materials Received (Answered by 26 libraries)

Items	Library Size (No. / %)			
	Large	Medium	Small	Total for all
20,000+	1 (16.7%)	3 (33.3%)	0 (0.0%)	4 (15.4%)
10,000-20,000	4 (66.7%)	1 (11.1%)	1 (9.1%)	6 (23.1%)
5,000-10,000	1 (16.7%)	3 (33.3%)	0 (0.0%)	4 (15.4%)
Less than 5,000	0 (0.0%)	2 (22.2%)	10 (90.9%)	12 (46.2%)

VI. Types of Shelf-Ready Materials Received (by Library Size)

Media type	Library Size (No. / %)			
	Large	Medium	Small	Total for all
Print (domestic vendors)	6 (100.0%)	10 (100.0%)	11 (100.0%)	27 (100.0%)
Print (foreign vendors)	1 (16.7%)	2 (20%)	4 (36.4%)	7 (25.9%)
Serials	1 (16.7%)	1 (10%)	1 (9.1%)	3 (11.1%)
CDs	0 (0.0%)	1 (10%)	1 (9.1%)	2 (7.4%)
DVDs	0 (0.0%)	1 (10%)	1 (9.1%)	2 (7.4%)

VII. Types of Materials Excluded from Shelf-Ready Processing

Media Type	Library Size (No. / %)			
	Large	Medium	Small	Total for all
Added volumes	4 (66.7%)	6 (60%)	2 (18.2%)	12 (44.4%)
Oversize	0 (0.0%)	1 (10%)	1 (9.1%)	2 (7.4%)
Rushed Materials	3 (50%)	7 (70%)	7 (63.6%)	17 (63%)
Certain library locations	3 (50%)	3 (30%)	4 (36.4%)	10 (37%)
Other:				
Print (non-domestic)	1 (16.7%)	0 (0.0%)	0 (0.0%)	1 (3.7%)
Added copies	1 (16.7%)	0 (0.0%)	0 (0.0%)	1 (3.7%)

VIII. Quality Control Implementation and Staff Involvement (Answered by 24 libraries)

Libraries/Size	Quality Control Performed		Staff Involved	
	Yes	No	Librarians	Library Assistants/ Tech
Large	5 (100.0%)	0 (0.0%)	2 (33.3%)	4 (66.7%)
Medium	8 (100.0%)	0 (0.0%)	3 (30.0%)	9 (90.0%)
Small	10 (90.9%)	1 (9.1%)	5 (45.5%)	6 (54.5%)
Total across all library groups	23 (95.8%)	1 (4.2%)	10 (37.0%)	19 (70.4%)

IX. Years of Performing Quality Control of Shelf-Ready Materials (Answered by 22 Libraries)

Time Frame	Library Size (No. / %)			
	Large	Medium	Small	Total for all
First 6 months	0 (0.0%)	2 (22.2%)	0 (0.0%)	2 (9.1%)
First year	0 (0.0%)	1 (11.1%)	4 (44.4%)	5 (22.7%)
First two years	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
As an on-going activity	4 (100%)	6 (66.7%)	5 (55.6)	15 (68.2%)

X. Effect of a Shelf-Ready on Cataloging Practices (Answered by 23 libraries)

Libraries/Size	Cataloging Practices Affected		Level		
	Yes	No	Modified	Abandoned	Both
Large	2 (50%)	2 (50%)	2 (100%)	0 (0.0%)	0 (0.0%)
Medium	8 (88.9%)	1 (11.1%)	7 (87.5%)	1 (12.5%)	2 (20%)
Small	4 (40%)	6 (60%)	2 (50%)	2 (50%)	0 (0.0%)
Total for all library groups	14 (60.9%)	9 (39.1%)	11 (78.6%)	3 (21.4%)	0 (0.0%)

XI. Level of Satisfaction with Shelf-Ready Services (Answered by 22 libraries)

Level	Library Size (No. / %)			
	Large	Medium	Small	Total for all
Very Satisfied	3 (75%)	4 (44.4%)	4 (44.4%)	11 (50%)
Satisfied	1 (25%)	2 (22.2%)	3 (33.3%)	6 (27.3%)
Moderately Satisfied	0 (0.0%)	2 (22.2%)	1 (11.1%)	3 (11.1%)
Not Satisfied	0 (0.0%)	1 (11.1%)	1 (11.1%)	2 (9.1%)

XII. Source of Feedback on Shelf-Ready Services

	Library Size (No. / %)			
	Large	Medium	Small	Total for all
Public services	2	5	2	9 (33.3%)
Technical services	3	7	7	17 (63%)
Users	1	2	4	7 (25.9%)
Other	0	2	1	3 (13.5%)

XIII. Shelf-Ready Services Expansion (Answered by 22 libraries)

Library Size	Library Size (No. / %)			
	Large	Medium	Small	Total for all
Strongly Agree	3	2	1	6 (27.3%)
Agree	0	2	2	4 (18.2%)
Disagree	1	3	0	4 (18.2%)
Strongly disagree	0	0	1	1 (4.5%)
Don't know	0	2	5	7 (31.8%)

Collection Development and Management

An Overview of the Literature, 2011–12

Kathleen A. Lehman

The collection development and management literature from 2011 and 2012 explores how libraries are making difficult collection choices with decreasing funds, competing needs for space, and a continually developing e-market. Digital content is no longer new in collection management, but some of the ways the content is chosen have changed; collection-building activities now include various models of patron-driven demand acquisitions. Other literature in this area examines how libraries are addressing their print and electronic collections with topics including open access materials, shared collection building, and weeding collections for repurposed space.

To sum up the collection development and management literature published in 2011–12, Liz Chapman, director of Library Services, London School of Economics and Political Science, does it best: “Our fundamental responsibilities in collection development have not changed, but our methods have.”¹ Much of the collection management and development literature in 2011 and 2012 focused on activities in response to two main factors: limited budgets and the need for more or redefined space. Both these factors have been a reality for many years, but projects that started at the beginning of the most recent recession, plus the continuing growth of the e-book industry and the availability of open access (OA) resources, are now more reported in the library literature. This paper reports on the development of these trends.

This overview does not include *all* available literature on collection management and development from 2011 and 2012, but it focuses on a significant portion of what has been written and identifies trends. Both EBSCO’s *Library, Information Science and Technology Abstracts (LISTA)* and *Library Literature and Information Science Full Text* databases were searched for relevant literature. While there is significant overlap in the two databases, each contains unique journals, and most resources consulted for this review are from these databases. Additional searches were conducted using Google to gain information on various organizations and programs. The author also consulted several publishers’ recent catalogs, including ALA Publishing (Neal-Schuman and the ALA Store) and Libraries Unlimited to find more relevant monographic publications than those titles retrieved from database searches. Most literature retrieved focused on practices and trends in academic libraries, and literature on other types of libraries was

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not purposefully excluded. Similarly, publications tended to focus on findings in the United States.

Patron-Initiated Purchasing

Demand-Driven Acquisitions

Many of the challenges that libraries face today are the same ones that libraries have always faced, but in a new form. Although no library has had sufficient funds to purchase everything it wanted, today's particularly slim budgets mean that librarians must focus on the main principle of basing collection decisions on patron needs.² Librarians, knowing they must justify their spending and, in some cases, even the existence of their libraries, have become more judicious about how funds are spent, looking closely at what is being requested and what is used.³ They make professional decisions about purchasing materials, decisions that are based on several factors, including resource reviews, developments in various subject fields, statistics that include usage and age of a collection, how the current collections might be lacking, and patrons' needs. Librarians have always considered direct requests from patrons, but it is this last method that has seen progressively more emphasis as budgets become increasingly tight and each purchasing decision carries greater weight. Studies dating back to 1979 show that much of what is purchased using traditional acquisitions methods goes unused.⁴ Many libraries are responding to patrons by transferring some of the purchasing power directly to them through demand-driven acquisitions (DDA) or patron-driven acquisitions (PDA). (Note: For the remainder of this paper, the various processes of direct patron selection will be referred to as "DDA.") Rather than purchasing what librarians anticipate patrons want, libraries are purchasing the resources at the point at which it is used or requested by the patron. This shift is a change from the "just in case" model to "just in time," with the focus moving from collections to usage and the decisions moving from librarians to patrons.⁵ Even if a purchased resource is used only by the patron who made the request, it is still considered as a circulation; historically, many books in library collections never get that initial circulation.⁶ Additionally, subscribing to publishers' "Big Deal" bundles is a practice that is no longer viewed favorably.⁷ These bundled groupings of resources originally provided cost-effective ways for libraries to deliver access to large collections of information. As the prices of bundles continue to rise, librarians have found that the deals lack the flexibility to effectively balance their budgets.⁸ To fund DDA programs, many libraries start with one-time funds for pilot programs. Once the money is expended, they review the results to see what has been purchased, how much has been spent, and determine whether the program will continue.⁹

DDA programs are often used for e-book purchases, and suppliers (such as Yankee Book Peddler, more commonly known as YBP) provide records for a library to load into its catalog. The patron cannot tell the difference between an e-book that has been purchased by the library and one that is a part of a DDA program. When a patron searches the catalog, these records show up in the results display side-by-side. In either case, when the patron clicks on the link embedded in the bibliographic record, the book opens on the vendor's platform. The library does not pay for the resource unless it is used by a patron, and typically after an agreed-on "trigger" is reached.¹⁰ The definition of this "trigger," or "use," varies by supplier but can be an activity such as staying on a page for five minutes or longer, navigating through a set number of pages, or downloading or printing a portion of the e-book. Many DDA programs will allow for a set number of uses before the e-book becomes a part of the library's permanent collection. The initial uses can be considered as short-term rentals with the rental price often set around 10 percent to 20 percent of the full price of the resource, depending on the publisher.¹¹ After a few rentals (often two or three) of the same item, the library pays the full purchase price and has perpetual access to the e-book. Additional purchases for the same title may be triggered after a certain number of holds have been placed on the e-book. DDA programs eliminate the need to pay for materials that are not used. These programs, however, require libraries to abandon the concept of the perceived need for ownership, which can be difficult for those in the library world and for library supporters.¹²

Interlibrary Loan as a Form of DDA

Another example of DDA is through interlibrary loan (ILL) requests.¹³ In this case, when a request is placed to borrow a book from another library, the ILL department considers purchasing the item and adding it to the collection. Like the e-book DDA programs, purchasing resources based on ILL requests is another way to respond to patrons at their point of need. There are shipping charges associated with a physical ILL transaction, and some libraries have decided that purchasing the requested items is a better use of funds. Purdue University Libraries instituted this method of DDA in 2000.¹⁴ After reviewing circulation statistics, Purdue librarians found that books purchased through the DDA program were more likely to circulate than those purchased through traditional selection.¹⁵ This was true both when considering the initial circulation from the patron who requested the book through DDA and when considering subsequent circulations.

DDA programs are often mediated by librarians. Most libraries set a limit on the cost for a single item, define the call number range into which the item will fall, require that the title must have been published within the past few years

or place other restrictions on loaded records or purchase requests to ensure that the acquisitions are aligned with the library's collection-building mission. Items that fall outside these parameters are either not loaded into the catalog or the request through ILL may be individually considered by a subject or collections librarian. Specifications from the DDA program of the State University of New York System initially stipulated that a purchased resource must cost fewer than \$300, be published in the past five years, could not duplicate a title owned by the libraries, and, since their program was through ILL, had to be likely to arrive within a short timeframe.¹⁶

Print-on-Demand

Print-on-demand, which is often provided using a machine like the Espresso Book Machine (EBM), is another on-demand program that adds books to a library's collection.¹⁷ The EBM contains the digital files for millions of books. At a user's request, a book is printed and bound in minutes while the patron waits. The book can then become a part of the library's collection or can be purchased by the patron. This kind of on-demand printing may also be used to preserve rare or fragile materials.¹⁸ A copy can be produced of materials from special collections to minimize the handling of the originals. The print-on-demand version of DDA has not become widely used in part because of the initial startup costs for the machine itself. The e-book and ILL methods of DDA take advantage of existing processes and resources and do not require an unwieldy initial financial investment. Ideally, the money is spent slowly as titles are requested and the investment is spread out over a longer period and can be defined by the institution's budgetary constraints and not the cost of equipment.

"E" Growing Pains

In their paper on the shared collection management of printed materials, Sandler et al. state, "As scholars increasingly rely upon electronic access to needed resources, these libraries—like libraries everywhere—are seeking ways to preserve access to the printed volume but at the same time redirecting resources—dollars, staff, and space—to the management of increasingly digital collections."¹⁹ Wilde and Level of Colorado State University address the shifting balance of print and digital: "The library as a building and place with immense physical collection is no longer the sustainable model. The availability of large amounts of electronic usage statistics has been pushing libraries toward a more numbers-based model of collection development, and the economic crisis accelerated the transition."²⁰ This "transition" to "increasingly digital collections" is clearly

reflected in monographs published during 2011 and 2012. *No Shelf Required* was published in 2011 in response to the quickly increasing use of e-books and reading devices and is an attempt to help readers understand the e-book landscape.²¹ The following year, *No Shelf Required 2* was published, calling e-books "mainstream."²² A sampling of titles from these years demonstrates how libraries' electronic collections are continuing to grow rapidly: *Building and Managing E-Book Collections*, *Collection Development in the Digital Age*, *Managing Electronic Resources*, and *Electronic Resources Management in the Academic Library*.²³ In 2011, Amazon reported that its e-book sales had surpassed its print sales, and many publishers have experienced a substantial decrease in their print business.²⁴ Yet, while there is an increasing push toward and availability of e-resources, there is still an audience for print. Faculty at many academic institutions rely on materials that are available digitally for their everyday research but are not yet comfortable with the idea of a library's collection being void of print.²⁵ Text within e-books can be easily searched, users can adjust the text size to meet their needs, and books on a device do not increase the weight or space occupied in a book bag. Users, however, can be limited by a device's battery life, may have difficulty loading new content, and may find reading a screen more difficult than reading a printed page.²⁶

Online databases are generally preferred for journal article access, but the preference for books continues to lean toward print over e-books. Subject matter or research area can also influence the preference of print or electronic. For example, many e-resources are available for the sciences, yet there are fewer for the arts.²⁷ Library-provided e-resources in the arts are not as often used in part because of uncertainties in intellectual property rights and fair use and because of the relative ease of image-searching on the Internet, including Google Image Search.²⁸ Libraries are finding that their patrons' preference for digital or print can vary and depends on the time, place, and purpose for access to the materials.

Preservation Considerations

With the purchase of physical items for a libraries' collection, the ownership and preservation responsibilities have been straightforward in that once an item is purchased, the library sets lending limits, decides whether to retain an item, or determines when an item needs further care (e.g., rebinding) to keep it in useable condition. With e-resources, much of the ownership rights, responsibility for preservation, and access restrictions are set by the publisher. In the past, one safeguard against information loss was that books were collected by multiple libraries.²⁹ If an item were to be damaged at one library, there were other collections from which it could be borrowed. With e-resources, there is a different set of issues: What happens when the library no longer

subscribes to or can pay for the platform through which the e-resource is accessed by patrons? What happens if the publisher or supplier of the e-resource ceases to exist?³⁰ What happens as software develops and the technology used to access a book's content is no longer supported?³¹ For the concern about the continued existence of a content publisher or provider, Portico works with publishers and libraries to preserve digital content. Portico, which is a service of Ithaka, has preserved e-journal content since 2005 and expanded its services to e-books in 2008.³² As for what happens if a library no longer subscribes to content, some publishers now allow for post-cancellation access (PCA) via Portico.³³ In 2012, there was a lack of PCA options, but as of the writing of this review, Portico reports that 88 percent of the e-journal content and 87 percent of the e-book content it preserves is available for PCA.³⁴ Regarding outdated software, there is the preservation tactic of migrating content from one format to another. However, as with rebinding a physical item, this requires time and resources. With rebinding, often the need to care for items comes one at a time, while the need to reformat digital materials may affect a large portion of the collection all at once.

Another difficulty with libraries trying to preserve or access materials as freely as they would like is Digital Rights Management (DRM). DRM refers to a "set of 'technologies' that e-producers . . . may employ to control access to and use of their copyrighted material, especially copying, by third parties."³⁵ Restrictions can include limiting the number of simultaneous users who can access the content, limiting the number of pages that can be downloaded or printed, or limiting the type of device on which the content can be accessed. These technologies restrict libraries' ability to manipulate the content and therefore make digital migration difficult. Since libraries are unable to ensure preservation for perpetual access through migration on their own, the responsibility for preservation of the digital content rests with the publishers or through cooperative services such as Portico.³⁶ Part of Portico's preservation plan and process is migration.³⁷

Ongoing and Future Costs

An additional concern with e-books is ongoing and future costs. Since the information contained in e-books is stored on a publisher or vendor's server, many of them charge annually for continued access to the platform. Even though the library has paid for the digital item, it must pay an additional fee to ensure that patrons can use the platform to access the content. Additionally, the initial cost of purchase is an unsettled issue: sometimes digital is cheaper than print and sometimes the opposite is true, and allowing access by multiple users often drastically escalates the price. Without clear industry standards, publishers seem to be testing the prices the market is willing to tolerate.³⁸

The e-book model has affected ILL. Print books can be shipped to another library through the mail; e-books licensing agreements typically limit access to directly affiliated users.³⁹ E-books have the potential to alleviate some of the burdens of traditional ILL print lending, specifically the cost of shipping, the delay of lending caused by the need to physically move items, and the potential for materials to be returned damaged either from the shipping process or by a careless patron.⁴⁰ A partnership between Ingram Content Group and OCLC Online Computer Library Center allows for short-term lending of e-books using WorldCat Resource Sharing and ILLiad Resource Sharing Management Software, which are the same tools many libraries use for traditional ILL.⁴¹ Some consortia, like TexShare and OhioLINK, make group e-book purchases rather than require each library to make individual purchases.⁴² While this is not an ILL model, it is an alternative, cost-effective way to provide a more diverse collection than if each library were separately purchasing for its local patrons.

Open Access

Open access (OA) has become a consideration in e-resources collection management. When referring to OA materials, most authors, researchers, and librarians are discussing research or scholarly information, such as a journal article, that is available freely on online for anyone to read.⁴³ Interested individuals who might not be able to afford access to research publications can benefit from the availability of OA materials. For libraries, OA materials can be useful as inexpensive additions to their collections. OA does not mean that the publications are truly free; someone is paying the cost for the publication process. In many cases, the researchers pay for the article, either with support from their institutions or from the grants used to conduct the research. Publication fees can range from a few hundred to thousands of dollars.⁴⁴ There are many different iterations of OA. For example, green OA refers to articles that are available via an open digital repository. Gold OA refers to journals that provide all content free for end users at the time of publication. Some publishers give authors the option to pay for publication, which creates a journal in which some of the articles are OA and some are not, while some other publishers provide content freely only after an embargo period.⁴⁵

Once the publication of the material has been paid for, the financial barriers to access to the wider public are diminished, and OA publication can accelerate the research process.⁴⁶ With information easily accessible, researchers can more quickly begin building on the published information. Regardless of whether the articles are freely available, they will not be useful if they are not easily found. Researchers may often turn to a web search engine to find resources, so making OA materials discoverable in library catalogs and in

research databases is critical.⁴⁷ Librarians should be aware of which OA titles are available and make choices regarding what to include in their libraries' catalog, their A-Z lists, or their database subscriptions to support their patrons' research.

It can be difficult to determine whether an OA publication is credible or not. Some OA journals have proven their quality: *PLoS Biology*, for example, has the highest impact factor rating in its field.⁴⁸ Other OA publications are not as well known, and librarians and researchers may be concerned with the existence of predatory publishers. Predatory publishers produce OA journals that lack the rigorous review standards of higher-quality journals and will publish any article if the authors are willing to pay a fee.⁴⁹ These publishers' websites are often vague or deceptive regarding fees associated with publishing or regarding licensing and copyright.⁵⁰ They may trick authors into publishing by inviting papers and later billing them, and they are taking advantage of a system where researchers' careers depend heavily on how often they publish and on the success of their publications. Beall compared these journals with email spam.⁵¹ For librarians, the concern is to be aware of these types of predatory OA journals both so they do not include them in the libraries' catalogs and to keep their patrons informed about what are bona fide high-quality OA resources.

Collaborative Collection Development and Storage Considerations

More users are coming to expect libraries to be places of service and places to study rather than places that hold books, and library personnel are challenged to allocate space wisely.⁵² Past collection-building practices have left shelves filled to capacity, but not necessarily with current and quality resources. A big consideration in finding and redefining space includes evaluating, shifting, and transferring collections. Libraries often begin by evaluating journal runs, which are more likely to be available and to be used digitally than monographs. Faculty at academic institutions continue to grow more comfortable with e-only access, and many have come to *expect* the ease of e-access for journal articles.⁵³ The preference for articles to be available digitally is clearly reflected in use data. As print use has steadily declined over the past several years, e-journal use continues to rise.⁵⁴ Moving large journal runs is more efficient both in time and expense than dealing with monographs.⁵⁵ Titles that are available through trusted providers like JSTOR and Portico are more likely to be moved to storage because librarians are confident that the materials will be easily available for their patrons into the foreseeable future.⁵⁶ The role of print materials, particularly journals, has become one of preservation rather than direct patron use.⁵⁷

Another way that libraries are working to conserve space and money is by developing collection plans with partner libraries. These are formal agreements and programs developed and carried out by a group of libraries that see benefit in working together.⁵⁸ Rather than focusing on local collections, libraries work together to create a fuller shared collection than any one of them could do alone. Although access for local patrons may not be as immediate as it would be if all material were owned locally, a large shared collection is more of a financial reality and the scope of the collection available is wider than any one library can house. Challenges arise from working together, including definitions of ownership, scope, and intent of the shared collection, funds available, and, if shared storage is involved, managing the workload of identifying and transferring items to a new location.⁵⁹ One study gives the price difference between housing items in open stacks versus housing them in high density storage at \$3.40 per item per year, with open stacks being the more expensive option; shared storage can save space and money.⁶⁰ Some of the high-density storage facilities that service multiple libraries include the Washington (DC) Research Consortium, the Research Collections and Preservation Consortium hosted by Princeton University, and the Five Colleges Library Depository in Amherst, Massachusetts.⁶¹ Trust between the participating libraries is a key element for these types of collection partnerships to be successful. Therefore most partnerships develop from existing consortia or similar networks that already work together.⁶² The "Cloud Library" project, for example, was started in 2009 following a discussion between several Association of Research Libraries (ARL) directors who wanted to examine the challenges and opportunities faced by academic libraries, including how to balance preservation with finding space and realizing financial efficiency in managing collections.⁶³

As more libraries begin to share collections and deposit materials, the measurement of the size of a libraries' collection no longer equates with its quality. A more current measure of a library's worth is the amount of unique material to which its patrons have access.⁶⁴ Chadwell cites several sources that state the value of a collection no longer comes from the number of volumes held but rather in the effect those resources have and how they influence and encourage education; a library's value is in the services and expertise it provides to its user group.⁶⁵ Collective depositories and repositories provide some assurance of preserving rare and unique items.⁶⁶ Some collaborative agreements come not from sharing storage facilities but from a certain number of institutions agreeing to retain and preserve particular materials, like a run of a journal, so that other institutions can remove their copies and reclaim space.⁶⁷ The previously mentioned Cloud Library project found that very few print collections were needed to duplicate material that had been digitized by the HathiTrust.⁶⁸ As libraries continue to look

beyond their own stacks and to find ways to work productively with others, the shift in mindset from ownership to providing access will also continue.

Tending to the Collection: Weeding

Although education programs in library science cover collection-development policies and weeding practices, sometimes the reality of the library as a workplace does not reflect these “best practices.”⁶⁹ The argument has been made that libraries spend far too much of their budgets and personnel energy on using the library as a museum when the focus needs to be on the library as a place of creative discovery and service.⁷⁰ Others believe that preservation of information (not necessarily in print) is a core value of libraries.⁷¹ Some libraries resist weeding collections because of the public’s perception of the library as safe places for materials.⁷² The public may view weeding as a threat to their access to information. In reality, a well-maintained, well-pruned collection is far more useful than one filled with out-of-date or unused materials. Many libraries are returning to the very important task of weeding as they run out of space and face the costs of storage and maintenance of their physical collections. They are running out of space not just for new acquisitions but also for the patrons who use the library space. This is reflected in the William F. Ekstrom Library at the University of Louisville where “in addition to new financial considerations, much of Ekstrom’s first floor, home of the reference collection, has been repurposed as a learning commons.”⁷³ Similar space considerations were taken into account at American University Library where the authors noted “the library could gain valuable room for growth in the monographic collection and still allow for space improvements designed to make the building more attractive to students and researchers.”⁷⁴ Schonfeld’s “What to Withdraw” is a study that provides recommendations and tools for weeding collections based in part on the 2009 Ithaka S+R Faculty Survey, which includes responses from more than 3,000 participants.⁷⁵ By listening to what patrons are comfortable using and looking at shifting attitudes, the report suggests how libraries can respond to the need to weed. The report describes the ideal situation in which something could be withdrawn: a situation where access and preservation are ensured by other sources.⁷⁶ Schonfeld suggests that with well-digitized journals, if there are two verified print copies in trusted repositories, other libraries can weed their own print copies.⁷⁷ One institution that has renewed and revalidated the weeding process is the library at Concordia College in Moorhead, Minnesota. Although there were previous uncoordinated efforts to weed some of the collection, the Carl B. Ylvbisaker Library had nearly reached capacity.⁷⁸ The librarians made an organized effort

to weed their collection, starting in 2007. They developed a plan to work in teams and review assigned sections of the collection over the following eight years. When the authors wrote about the weeding project, the procedures had been in place for four years and the project was still successful.⁷⁹ In addition to relieving the space concerns, the authors reported that the process resulted in a better understanding of the collection and created a better working environment as people collaborated on this project.

Shared collection storage projects mentioned above and other shifting projects provide good opportunities to weed. Since each transferred book must be handled, reviewing the items as part of the same project can save time and money. Combining these projects saves money by reducing the costs of storing unwanted materials and anticipates future costs when space constraints may force a library to review its physical collections again. One article reports that it is much easier to weed before the materials go into storage.⁸⁰ In that particular case, the Grand Valley State University Libraries reported on the challenges of weeding the law library collection, which was held in an automated storage and retrieval system (ARS).⁸¹ Materials were arranged by size rather than by call number, and they were retrieved by barcode number. One might find a wide array of call numbers in a bin of materials, which makes weeding in a specific topic extremely difficult. The authors gave a sound piece of advice: “Completely and aggressively weed collections before moving them into an ARS.”⁸²

Weeding has always been an important component of collection management, but the nonphysical nature of electronic collections may seem to take away some of the urgency that is apparent in traditional collections. With physical collections there is a real need for physical shelf space; unused items must be moved to make way for new acquisitions. Weeding physical collections means making a collection more relevant to the patrons as they search the shelves and catalog for the materials. Some of these considerations continue to be relevant for e-collections. Libraries may not need the shelf space, but clearing out unused materials makes a patron’s searching experience better by reducing the number of old and irrelevant records the patrons must wade through in their search results to find what they really want.⁸³ In some cases, like the DDA programs in which item records are loaded into the library’s catalog for patron discovery, some of the weeding is part of the cycle: if items are not used and not purchased after a given amount of time, the records are automatically removed. When librarians are considering e-items to remove, reference material that has been superseded by new editions and materials that have not circulated (i.e., been accessed) during a set period should be removed from the collection.⁸⁴ Suppressed records are not maintenance free as they occupy digital space and require personnel time to maintain. In theory, the weeding process

for e-books should be as simple as deleting the record from the library's catalog, but the practice of weeding e-books is not yet well supported by all providers' platforms. Often, once purchased within the vendor's platform, there is no way to remove the record directly; librarians must work through customer service to weed out unwanted or outdated items.⁸⁵

Conclusion

As libraries and publishers navigate the landscape of a growing e-resources market, librarians continue to look for ways to handle their physical collections and spaces. By using DDA programs, libraries are building collections that are based on the patrons' direct needs. While there are plenty of uncertainties in the world of e-materials in terms of rights and preservation, libraries and patrons are becoming more comfortable with and reliant on collections that are available when and where they are needed. By working together, libraries are finding ways to pare down their collections to save and repurpose space, to use money more wisely, to weed collections so they have more focus, and to help with preservation efforts. The trends that are apparent in the literature from the 2011 and 2012 have grown out of the constant need to balance space, budgets, patrons' requests, and the desire to preserve.

References

1. Liz Chapman, forward to *Collection Development in the Digital Age*, ed. Maggie Fieldhouse and Audrey Marshall (London: Facet, 2012), vii.
2. G. Edward Evans and Margaret Zarnosky Saponaro, *Collection Management Basics*, 6th ed. (Santa Barbara, CA: Libraries Unlimited, 2012), 5, 69, 97–98.
3. Michelle Wilde and Allison Level, "How to Drink from a Fire Hose without Drowning: Collection Assessment in a Numbers-Driven Environment," *Collection Management* 36, no. 4 (2011): 218, 221.
4. Kenning Arlitsch, "The Espresso Book Machine: A Change Agent for Libraries," *Library Hi Tech* 29, no. 1 (2011): 64.
5. Lars Leon and Nancy Kress, "Looking at Resource Sharing Costs," *Interlending & Document Supply* 40, no. 2 (2012): 82.
6. Tim Collins, "The Current Budget Environment and Its Impact on Libraries, Publishers and Vendors," *Journal of Library Administration* 52, no. 1 (2012): 33–34; H. Austin Booth and Kathleen O'Brien, "Demand-Driven Cooperative Collection Development: Three Case Studies from the USA," *Interlending & Document Supply* 39, no. 3 (2011): 148.
7. Faye A. Chadwell, "What's Next for Collection Management and Managers? Sustainability Dilemmas," *Collection Management* 37, no. 1 (2012): 5; Collins, "The Current Budget Environment," 24.
8. Dennis Dillon, "Texas Demand-Driven Acquisitions: Controlling Costs in a Large-Scale PDA Program," in *Patron-Driven Acquisitions: History and Best Practices*, ed. David A Swords (Berlin: De Gruyter Saur, 2011), 159.
9. Booth and O'Brien, "Demand-Driven Cooperative Collection Development," 153–54.
10. Lindsey Schell, "The Academic Library E-Book," in *No Shelf Required: E-Books in Libraries*, ed. Sue Polanka (Chicago: American Library Association, 2011), 76–78; Collins, "The Current Budget Environment," 34.
11. Carolyn Morris and Lisa Sibert, "Acquiring E-Books," in *No Shelf Required: E-Books in Libraries*, ed. Sue Polanka, (Chicago: American Library Association, 2011), 100–101.
12. Steven R. Harris, "Mortgaging our Future on Ownership, Or, the Pleasures of Renting," *Against the Grain* 23, no. 4 (2011): 28–32.
13. Booth and O'Brien, "Demand-Driven Cooperative Collection Development," 148–50.
14. Judith M. Nixon and E. Stewart Saunders, "A Study of Circulation Statistics of Books on Demand: A Decade of Patron-Driven Collection Development, Part 3," in *Patron-Driven Acquisitions: Current Successes and Future Directions*, ed. Judith M. Nixon, Robert S. Freeman, and Suzanne M. Ward (New York: Routledge, 2011), 33–43.
15. *Ibid.*, 37–39, 42.
16. Booth and O'Brien, "Demand-Driven Cooperative Collection Development," 153.
17. Arlitsch, "The Espresso Book Machine," 62–63, 65.
18. *Ibid.*, 66–67.
19. Mark Sandler et al., "CIC Co-Investment to Protect Print Research Library Collections in the Midwestern United States," *Collection Management* 37, no. 3–4 (2012): 238.
20. Wilde and Level, "How to Drink from a Fire Hose Without Drowning," 229.
21. Sue Polanka, ed., *No Shelf Required: E-Books in Libraries* (Chicago: American Library Association, 2011), xi–xiii.
22. Sue Polanka, ed., *No Shelf Required 2: Use and Management of Electronic Books* (Chicago: American Library Association, 2012), ix.
23. Richard Kaplan, ed., *Building and Managing E-Book Collections: A How-To-Do-It Manual for Librarians* (Chicago: Neal-Schuman, 2012); Maggie Fieldhouse and Audrey Marshall, ed., *Collection Development in the Digital Age* (London: Facet, 2012); Ryan O. Weir, ed., *Managing Electronic Resources* (Chicago: ALA Techsource, 2012); Karin Wikoff, *Electronic Resources Management in the Academic Library* (Santa Barbara, CA: Libraries Unlimited, 2012).
24. Fern M. Cheek and Lynda J. Hartel, "The Electronic Book—Beginnings to the Present," in *Building and Managing E-Book Collections: A How-To-Do-It Manual for Librarians*, ed. Richard Kaplan (Chicago: Neal-Schuman, 2012), 4; Collins, "The Current Budget Environment," 24.
25. Laurel Ivy Sammonds and Ross Housewright, "Print

- Collections Management in the Wake of Digitization," *Serials Librarian* 61, no. 2 (2011): 194.
26. Cheek and Hartel, "The Electronic Book," 5.
 27. Tamsyn Bayliss, "Viewpoint: What is the Future of Art Libraries?" *Art Libraries Journal* 37, no. 1 (2012): 4.
 28. Virginia Rutledge, "Viewpoint: Legalizing the Practice of Art History," *Art Libraries Journal* 37, no. 2 (2012): 3; Victoria Brown and Catherine Worrall, "Art in the Digital Age: A Comparative Study of the Adoption of Electronic Visual Resources in the UK, Ireland and North America," *Art Libraries Journal* 37, no. 3 (2012): 23–25; Mary Kandiuk, "Digital Images in Teaching and Learning at York University: Are the Libraries Meeting the Needs of Faculty Members in Fine Arts?" *Evidence Based Library & Information Practice* 7, no. 2 (2012): 25.
 29. Amy Kirchhoff, "E-Book Preservation: Business and Content Challenges," in *No Shelf Required 2: Use and Management of Electronic Books*, ed. Sue Polanka (Chicago: American Library Association, 2012), 72.
 30. Vickery Bowles and Linda Hazzan, "Balancing Patron Demand for all Formats," *Public Libraries* 51, no. 1 (2012): 40.
 31. Kirchhoff, "E-Book Preservation," 72.
 32. "Portico," Portico, accessed November 1, 2013, www.portico.org/digital-preservation.
 33. "Post Cancellation Access," Portico, accessed November 1, 2013, www.portico.org/digital-preservation/services/reliable-access/post-cancellation-access.
 34. Ibid.; Magaly Bascones, "JISC Collections: Post-Cancellation Entitlement Registry Scoping Project," *Collaborative Librarianship* 4, no. 3 (2012) 85–95.
 35. Evans and Saponaro, *Collection Management Basics*, 239.
 36. Nadia J. Lalla, "E-Book Publishing—the View from the Library," in *Building and Managing E-Book Collections: A How-To-Do-It Manual for Librarians*, ed. Richard Kaplan (Chicago: Neal-Schuman, 2012), 24–26, 31.
 37. Michael Seadle, "Archiving in the Digital World: The Scholarly Literature," *Library Hi Tech* 30, no. 2 (2012): 372.
 38. Ibid., 25–26, 34.
 39. Leon and Kress, "Looking at Resource Sharing Costs," 81.
 40. Schell, "The Academic Library E-Book," 90–91.
 41. "OCLC and Ingram to Offer New Option for Access to e-Books," OCLC Online Computer Library Center, press release, April 11, 2011, www.oclc.org/news/releases/2011/2011116.en.html; "Enhancement to Ingram's MyiLibrary Short-Term E-book Loan Access," OCLC Online Computer Library Center, press release, November 20, 2012, www.oclc.org/news/announcements/2012/announcement53.en.html.
 42. Schell, "The Academic Library E-Book," 83–84.
 43. Walt Crawford, *Open Access: What You Need to Know Now* (Chicago: American Library Association, 2011), 1, 11.
 44. Cheryl S. Collins and William H. Walters, "Open Access Journals in College Library Collections," in *Serials Collection Management in Recessionary Times*, ed. Karen Lawson, (New York: Routledge, 2011), 64–65.
 45. Crawford, *Open Access: What You Need to Know Now*, 15–23.
 46. Ibid., 1, 4.
 47. Collins and Walters, "Open Access Journals in College Library Collections," 59, 65, 72, 74.
 48. Crawford, *Open Access*, 28.
 49. Jeffrey Beall, "Predatory Publishers are Corrupting Open Access," *Nature* 489, no. 7415 (2012): 179.
 50. Jeffrey Beall, "Five Scholarly Open Access Publishers," *Charleston Advisor* 13, no. 4 (2012): 5–10.
 51. Beall, "Predatory Publishers," 179.
 52. William Joseph Thomas, "Trusting Digital Preservation for Print Collection Management, or How Librarians Should Learn to Stop Worrying and Love the 'E,'" *Against the Grain* 23, no. 4 (2011), 24.
 53. Roger C. Schonfeld, "What to Withdraw? Print Collection Management in the Wake of Digitization," *Serials Librarian* 60, no. 1–4 (2011): 141–42.
 54. Robert K. Reeves and Kari Schmidt, "Radical Relocation: Adapting Print Collections to an E-Centric World," *Serials Librarian* 61, no. 3–4 (2011), 412–29.
 55. Sandler et al., "CIC Co-Investment," 257.
 56. Thomas, "Trusting Digital Preservation for Print Collection Management," 24; Reeves and Schmidt, "Radical Relocation," 412–15.
 57. Schonfeld, "What to Withdraw?" 141–45.
 58. Robert H. Kieft and Lizanne Payne, "Collective Collection, Collective Action," *Collection Management* 37, no. 3–4 (2012), 137–52.
 59. Susanne K. Clement, "From Collaborative Purchasing Towards Collaborative Discarding: The Evolution of the Shared Print Repository," *Collection Management* 37, no. 3–4 (2012): 153–67.
 60. Sam Demas and Wendy Lougee, "Shaping a National Collective Collection: Will Your Campus Participate?" *Library Issues* 31, no. 6 (2011): 2.
 61. Ibid.
 62. Kieft and Payne, "Collective Collection, Collective Action," 142.
 63. Constance Malpas, *Cloud-Sourcing Research Collections: Managing Print in the Mass-Digitized Library Environment* (Dublin, OH: OCLC Research, 2011), 13–14, accessed April 26, 2013, www.oclc.org/research/publications/library/2011/2011-01.pdf.
 64. Kieft and Payne, "Collective Collection, Collective Action," 140.
 65. Faye A. Chadwell, "What's Next for Collection Management and Managers? Assessing the Value of Collection Services," *Collection Management* 37, no. 2 (2012): 58–64.
 66. Kieft and Payne, "Collective Collection, Collective Action,"

- 137, 148–49.
67. Demas and Lougee, “Shaping a National Collective Collection” 1–4.
68. Malpas, *Cloud-Sourcing Research Collections*, 9.
69. Carmelita Pickett et al., “Revisiting an Abandoned Practice: The Death and Resurrection of Collection Development Policies,” *Collection Management* 36, no. 3 (2011): 165–81.
70. Harris, “Mortgaging our Future on Ownership,” 28.
71. Evans and Saponaro, *Collection Management Basics*, 247–72.
72. Kieft and Payne, “Collective Collection, Collective Action,” 147.
73. Robert Detmering and Claudene Sproles, “Reference in Transition: A Case Study in Reference Collection Development,” *Collection Building* 31, no. 1 (2012): 19.
74. Reeves and Schmidt, “Radical Relocation,” 413.
75. Sammonds and Housewright, “Print Collections Management in the Wake of Digitization,” 193–95; Schonfeld, “What to Withdraw?” 141–45.
76. Schonfeld, “What to Withdraw?” 141–45.
77. *Ibid.*, 144.
78. Amy K. Soma and Lisa M. Sjoberg, “More Than Just Low-Hanging Fruit: A Collaborative Approach to Weeding in Academic Libraries,” *Collection Management* 36, no. 1 (2011), 17–28.
79. *Ibid.*
80. Patricia Bravender and Valeria Long, “Weeding an Outdated Collection in an Automated Retrieval System,” *Collection Management* 36, no. 4 (2011), 237–45.
81. *Ibid.*
82. *Ibid.*, 244.
83. Alice Crosetto, “Weeding E-Books,” in *No Shelf Required 2: Use and Management of Electronic Books*, ed. Sue Polanka (Chicago: American Library Association, 2012), 95–96.
84. *Ibid.*, 96–97.
85. *Ibid.*, 99–100; Alene E. Moroni, “Weeding in a Digital Age,” *Library Journal* 137, no. 15 (2012), 26–28.

WorldCat and SkyRiver

A Comparison of Record Quantity and Fullness

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In 2009, a new company, SkyRiver, began offering bibliographic utility services to libraries in direct competition to OCLC's WorldCat. This study examines the differences between the two databases in terms of hit rates, total number of records found for each title in the sample, number of non-English language records, and the presence and completeness of several elements in the most-held bibliographic record for each title. While this study discovered that the two databases had virtually the same hit rates and record fullness for the sample used—with encoding levels as the sole exception—the study results do indicate meaningful differences in the number of duplicate records and non-English-language records available in each database for recently published scholarly monographs.

The existence of SkyRiver means that libraries now have another choice of vendors from which to acquire bibliographic records and contribute original records. Therefore a comparison of the quantity and fullness of records available from OCLC's WorldCat and Innovative Interfaces's (III) SkyRiver can be helpful to libraries deciding which vendor would be best for their institution. This study compares the two databases in an attempt to determine whether there is a meaningful difference between them in terms of hit rates (percentages of records found in each database for each sample title), types of records (language of cataloging and format), and record fullness. Libraries can use this data in conjunction with other points of comparison, such as functionality, cost, and complementary services, when shopping for bibliographic services for cataloging. An understanding of the development of the two vendors and their products sets the stage for the comparisons made in this study.

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Overview of OCLC and SkyRiver

In 1967, the presidents of Ohio's academic libraries established the Ohio College Library Center with the goal of using computer technology to share bibliographic records to help reduce cataloging costs. The shared database, now known as WorldCat, became a reality in 1971. Ohio's experiment was extremely successful and quickly grew into an international nonprofit membership organization, Online Computer Library Center (OCLC).¹

Between 1971 and 2009, OCLC increased the size of its WorldCat database to more than 200 million records through the original cataloging records contributed by its members and with the acquisition of the Research Libraries Group's Research Libraries Information Network (RLIN) database and the Washington Library Network's (WLN) database.² However, OCLC's exponential growth has not been without difficulty. OCLC has faced not only monopoly related allegations from its competitors, but has had to face many challenges as the company attempts to build its international base. Various languages, bibliographic formats, and cataloging rules have made OCLC's foray into the international market challenging and have resulted in problems for its end user clients. Despite those difficulties, OCLC now serves libraries in 170 nations.³

In 1978, Jerry Kline co-founded Innovative Interfaces Inc. (III), which created as its first product a hardware/software system that libraries could use to automate the transfer of bibliographic records from OCLC into local catalogs.⁴ Having observed the growth of OCLC for three decades, Kline decided to mount a challenge by launching SkyRiver in 2009, only three years after the merger of OCLC and its last competitor. In 2013, Kline sold his interests in SkyRiver and Innovative Interfaces, and the new owners merged the two companies. This merger brings the bibliographic database, SkyRiver, into the product line of the parent company, III, just as WorldCat is a product of OCLC.⁵

At the outset, SkyRiver's database consisted of a variety of public sources including the Library of Congress (LC), the British Library (BL), and the Cooperative Online Serials Program (CONSER) records.⁶ SkyRiver has grown its database by incorporating the bibliographic records of existing local catalogs (including records originating from member libraries using WorldCat) and by the addition of new, original records created by SkyRiver customers.⁷ Partnerships with vendors have also expanded SkyRiver's ability to provide a wider range of bibliographic records to its clients. For example, *Library Journal* reported that in 2012, SkyRiver began a partnership with the Donohue Group Incorporated (DGI), which provides catalog records for recorded books as well as publisher's cataloging-in-publication (CIP) records from small and independent presses.⁸ According to SkyRiver, its database had 43 million records as of July 2013.⁹

Development of a Study of OCLC and SkyRiver

One possible reason for the size disparity between WorldCat's nearly over 300 million records and SkyRiver's 43 million is that SkyRiver aims to provide one unique record per title without duplicates.¹⁰ The company believes this will "[save] catalogers time and [reduce] searching frustration."¹¹ However, because of OCLC's global reach, WorldCat may have multiple records for a title, including many

English-language records plus records from international libraries whose language of cataloging is not English.¹² The size disparity between the two databases forms the basis of the quantity-related aspects of this study.

The authors devised a study to determine whether there would be a meaningful difference between the hit rates for the two databases. During the period of this study, catalogers began to use Resource Description and Access (RDA) rules to create new records, but since those rules do not affect the analyzed elements and criteria used in this study, the authors do not believe that RDA implementation influenced the study results. Additionally, this study takes into consideration the different types (e.g., non-English, print, etc.) and quantities of records for each title found in each database from a sample of 368 scholarly monographs.

Libraries are not only interested in whether a record for a title is available, but also in the quality of the bibliographic record found. Record quality has often been an important factor when comparing competing databases. Despite this importance, the concept of record quality remains inherently subjective as evidenced by the varying definitions and standards reported by Bade.¹³ For that reason, the authors chose to focus on the inclusion and completeness of certain MARC21 fields in a bibliographic record as indicators of record fullness. Those elements include matching International Standard Book Number (ISBN), matching date in the 008 (leader field), encoding level, LC call number, physical description, the presence of LC subject heading(s), and contents and summary notes. Because the samples for the study are scholarly monograph titles taken from the new purchases of two American university libraries, the inclusion of the LC call number (050/090 fields) was considered a more cogent indicator of record fullness for the sample than the Dewey classification number (082/092 fields). This was because the majority of academic libraries in the US use the LC classification system.¹⁴ LC subject headings were chosen as an analyzable element because they are carefully constructed and monitored by LC and Subject Authority Cooperative Program (SACO) members. The two university libraries from which the samples were drawn are not located in the same state as those of the researchers, nor do they have any direct ties.

Literature Review

There is certainly a historical tradition of comparing WorldCat's quantity and quality of bibliographic records with those of other databases. Describing the results of an exhaustive 1993 study of OCLC and WLN records, Ross concluded that "the hit rate for new monographic titles differed only by 1.4% between OCLC and WLN even though their databases vary substantially in size, OCLC with 24.8 million

bibliographic records and WLN with 7.8 million records.¹⁵

Hillman and Sugnet published a study of the OCLC and RLIN databases. Their 1983 findings indicated that OCLC's database would be more likely to produce results for older materials.

Probably the most difficult factor to analyze is the difference in coverage and size of the database. For some older material and state documents especially, the hit rate on RLIN is much poorer than on OCLC. . . . Searching on OCLC, the cataloger may come up with an older, retrocon record needing extensive revision. Searched on RLIN, one is more likely to find no record at all, which means that the cataloger must do that title originally.¹⁶

Writing in 1989, Intner could not find a statistical difference between WorldCat and RLIN, despite the two utilities' dissimilar philosophies of quality control and the commonly held belief "that OCLC is big and dirty, while RLIN is small and clean."¹⁷ While RLIN's original focus was on cataloging quality, OCLC initially focused on increasing the size of its database. Intner measured quality by measuring the accuracy of punctuation, capitalization, spelling, etc., in various MARC fields.¹⁸ Ross chose different indicators of record quality for her 1993 study. Her quality measurements included the encoding level and the inclusion of LC or Dewey call numbers.¹⁹

Instead of focusing on quality (that elusive term), recent research is focusing on how frequently various MARC fields are used. In 2006, Moen et al. published a large-scale study of millions of bibliographic records in OCLC's WorldCat. For this study, each occurrence of a field was counted, even if repeatable fields had multiple occurrences for a single record. For 2004, the most recent year studied, six MARC fields were found to have the most occurrences in monographic bibliographic records: 650 (subject heading), 245 (title statement), 008 (fixed fields), 500 (general note), 100 (personal name main entry), and 700 (personal name added entry), respectively. It should be noted that the study excluded system-generated fields, such as 001 (control number), 040 (cataloging source), and 029 (other system control number). While occurrences for MARC fields 260 (publication distribution, etc.), and 300 (physical description) were reported for previous years, they were not listed as commonly occurring fields for 2004.²⁰

Ongoing experimental OCLC research is also looking at the frequency of MARC fields; however, instead of focusing on the number of occurrences of various MARC fields, OCLC is studying what percentage of records in their database utilize a particular MARC field. Consequently, the number of occurrences of repeated fields is irrelevant to this research. All monographic bibliographic records analyzed

include an 040 and 245. Other fields that were used more than half of the time were 260 (93.65 percent), 300 (89.33 percent), and 100 (63.77 percent).²¹

In preparation for this study, the authors could not find any direct comparisons focusing on record quality or fullness between OCLC and its most recent competitor, SkyRiver. This holds true for both formal, peer-reviewed literature and less formal reports publicly available, including committee minutes from various library related groups. While not a comparison, a 2009 post to the OCLC-CAT discussion list outlines some statistics on encoding levels and LC-created records for WorldCat. At that time, nearly two-thirds (64 percent) of the records in WorldCat were considered minimum-level records, records that are cataloged as "less-than-core" (encoding level 2, 3, 4, 5, 7, K, or M). Additionally, less than one-tenth (8.6 percent) of the cataloging in WorldCat originated at LC.²² Beyond the promotional material from SkyRiver about its initial database, the authors did not discover any third-party statistics concerning any quality- or fullness-related indicators for the SkyRiver database.

Some of the less formal reports included quantity-related information concerning hit rates between OCLC and SkyRiver. Michigan State University (MSU) reported that the hit rate for approval plan books decreased only slightly with SkyRiver: 95–98 percent for OCLC compared to 93–95 percent for SkyRiver. Michigan State was one of SkyRiver's earliest large university library clients, and this favorable report, published in the *Association for Library Collections and Technical Services (ALCTS) Newsletter Online (ANO)*, may have encouraged other libraries to consider SkyRiver seriously.²³ In a 2010 report, Janes reported that the hit rate for her sample of new scholarly monographs at the Mabie Law Library in the University of California-Davis (UC-Davis) was 100 percent for OCLC and 98 percent for SkyRiver, a statistically insignificant difference.²⁴

Conversely, the committee minutes from two consortia do not show SkyRiver's hit rate in such a favorable light. During the March 2011 administrators' meeting of System-Wide Automated Network (SWAN), a Chicago-area consortium of eighty libraries, one participant mentioned a 2:1 ratio for original cataloging, which would result in increased costs for original cataloging activity if the group switched to SkyRiver.²⁵ The statistics reported to the ILS committee of the South Central Library System in Wisconsin in August 2012 show a hit rate of 90 percent for OCLC, but only 50–60 percent for SkyRiver. The report mentions that SkyRiver staff can supply records for 25–30 percent of items not found within forty-eight hours on request, but a committee member expressed concern about workflow while waiting for the supplied records.²⁶ Neither the Chicago-area consortium nor the Wisconsin reports mention the sample or method used for their comparisons.

Research Methods

To study whether there were meaningful differences in either hit rates or record fullness between WorldCat and SkyRiver, the authors chose to analyze a sample of titles. The sample for this study was provided by two academic libraries who had previously indicated a willingness to provide data, the University of North Carolina-Charlotte (UNCC) and the University of Arkansas-Little Rock (UALR). At the time of the study, UNCC had a full-time equivalent (FTE) of more than 20,000 students and, per the American Library Survey (ALS), was listed as Carnegie class Masters I. UALR had an FTE of approximately 8,000 students and, per the ALS, was listed as Carnegie class Doctoral/Research-Intensive. Each university library emailed the sample titles, 13-digit ISBNs, author and editor names, publication dates, and edition numbers of their recent print monograph purchases—368 titles in total—to the authors. Both libraries sent the information to the researchers using their Baker & Taylor YBP Library Services (YBP) order carts, so this could be described as a convenience sampling. The sample from UNCC consisted of the materials purchased from August 6 to September 20, 2012, a total of 244 titles, and the sample from UALR was for materials purchased from October 24, 2012 to February 28, 2013, a total of 124 titles. The sample information was incorporated into a Microsoft Excel spreadsheet, which was used to track and organize both the information provided for each book and the data found from the searches in both databases. The sample included monographs published in both English and Spanish. Publication dates for the sample ranged from 1977 to 2013; 89.9 percent were published from 2009 to 2013. There was no duplication of titles between the two samples.

Determining Hit Rate

To determine the hit rate in each database, an ISBN search in WorldCat and SkyRiver was conducted for each title in the sample. If the ISBN search failed to yield results, a title search was conducted. All searching and recording of data for record results was the same for WorldCat and SkyRiver, and took place during the same seven-day period, to lessen the likelihood that records could be added or modified in each database. To the authors' knowledge, there is no way to determine whether any of the SkyRiver records found and analyzed originated in WorldCat because SkyRiver records do not utilize an 035 field (system control number) containing an OCLC record number. However, SkyRiver contains "the Library of Congress MARC files and CONSER files," according to its webpage, as does WorldCat.²⁷

The total number of records resulting from either the ISBN or title search in both databases was recorded. The records found were categorized by type of record, and

the number of records of each type was recorded. Types of records found included non-English language records, English-language records, English-language print records, and e-book records in any language. The most widely held English-language print record found with a matching date was analyzed for fullness. If there were no records with a matching date, the most widely held English-language print record was analyzed. If a title search was necessary, the record's ISBN would not match the provided ISBN. The choice to count these records as hits was made even though some libraries may opt to create a new bibliographic record per local practice. Additionally, OCLC's Bibliographic Formats and Standards states that the absence, presence, or difference in ISBN does not justify the creation of a new record.²⁸

Many MARC elements were analyzed for the record which had the most holdings in OCLC and SkyRiver for each title (see tables 3, 4, and 6). For the 040 (cataloging source) field, the authors recorded the subfield a, which lists the code for the institution which created the record, and subfield b, which lists the language of transcription of the record. The authors considered subfield a to compare the composition of contributors of bibliographic records for the sample studied. The completeness level of the LC call number was also noted. LC call numbers were considered complete (with LC classification, Cutter, and publication year/volume number in a series), partial (missing one of the three elements), or absent. Call numbers for monographs published before the early 1980s, when adding the publication year to the call number became common practice, were considered partials, since the current practice would require altering the call number in most instances during the cataloging process. Additionally, the physical description of the resource (the 300 field) in each analyzed record was examined to determine whether it was complete (pagination and dimensions were present), or partial (if either of those were missing). The number of LC subject headings present in the record were also counted and recorded. Finally, the authors noted whether 505 (table of contents) and 520 (summary) fields were present in each record because they are two notes which are thought to be useful to patrons. Both notes are frequently found on full-level bibliographic records created within the past few years.

Results

This study focused on a comparison of both the quantity and fullness of records found in the two databases. Quantity was further broken down into the hit rate and the counts of the various types of records. There was little difference found between the two databases' overall hit rates (see table 1). Of the 368 titles searched, 363 (98.64 percent) were found in WorldCat and 362 (98.37 percent) in SkyRiver.

Table 1. Hit Rate Results for WorldCat and SkyRiver

Type of Search	WorldCat		SkyRiver	
	No.	%	No.	%
ISBN search	356	96.74	352	95.65
ISBN search (matching date)	350	95.11	341	92.66
ISBN or Title search	363	98.64	362	98.37
ISBN or Title search (matching date)	356	96.74	347	94.29

Table 3. MARC 21 Fields Used as an Indicator of Fullness

Field	WorldCat		SkyRiver	
	No.	%	No.	%
Matching ISBN	356	96.74	352	95.65
Matching Date	354	96.20	347	94.29
Full LC Call Number (050)	354	96.20	350	95.11
Complete Physical Description (300)	359	97.55	354	96.20
LC Subject Headings (6xxs)	357	97.10	354	96.20

More noticeable differences were discovered when focusing on the various types of records (see table 2). In WorldCat, of the 368 titles searched, 296 (80.43 percent) had records whose language of cataloging is not English, while SkyRiver had only 1 (0.27 percent) record of that type. Additionally, because SkyRiver states that “sophisticated matching algorithms minimize duplication,”²⁹ the percentages of searches for each database that resulted in only one or two total records, one or two English-language records, and one English-language print record were noted. Overall, a sizeable difference between the databases was found, with 70 (19.02 percent) of 368 items searched in WorldCat resulting in only one or two total records, contrasted with 320 (86.98 percent) of 368 titles searched in SkyRiver. The difference decreased after removing non-English language records and nonprint records. After these records were removed from consideration, of the 368 searched items, 160 (43.48 percent) of the titles searched resulted in a single English-language print record in WorldCat, as opposed to 304 (82.61 percent) in SkyRiver.

Table 3 shows the percentage of records found in WorldCat and SkyRiver with elements whose completeness indicate fullness. The two databases had no substantial differences when the authors compared these elements. Considering the elements individually, in WorldCat, 356 of the 368 titles (96.74 percent) had matching ISBNs and 352 of the 356 titles (95.65 percent) did in SkyRiver. When comparing the most-held record in terms of matching date, there was a slightly larger discrepancy with WorldCat having 354 titles (96.20 percent) and SkyRiver having 347 (94.29 percent).

Table 2. Hit rates for Various Types or Categories of Records

Records	WorldCat		SkyRiver	
	No.	%	No.	%
Non-English language	296	80.43	1	0.27
e-books with print ISBNs included	235	63.86	191	51.90
1 or 2 total records per item	70	19.02	320	86.96
1 or 2 English-language records per item	167	45.38	319	86.68
1 English-language print record per item	160	43.48	304	82.61

Table 4. Original Cataloging Source

Field	WorldCat		SkyRiver	
	No.	%	No.	%
Library of Congress (DLC)	234	66.03	240	65.22
Baker and Taylor (BTCTA)	35	9.51	31	8.42

The breakdown of complete call numbers for the two databases are WorldCat at 354 (96.20 percent) and SkyRiver at 350 (95.11 percent). Both databases had more records with complete physical descriptions, WorldCat with 359 (97.55 percent) and SkyRiver with 354 (96.20 percent). The smallest difference can be found when comparing the number of most-held records with at least one LC subject heading. Out of the 368 titles searched, WorldCat had 357 titles (97.10 percent) with at least one LC subject heading and SkyRiver had 354 titles (96.20 percent). It is significant to note that both WorldCat and SkyRiver scored approximately 95 percent or higher for each of the analyzed record elements.

A comparison of the most-held records for each title showed that 84.51 percent of the titles had the same cataloging source as indicated by the MARC field 040, subfield a (see table 4). Further study indicated that the highest percentage of records analyzed were created by LC. Of the 368 titles searched, 243 (66.03 percent) of the most-held records in WorldCat and 240 (65.22 percent) in SkyRiver were initially created by LC. The second most common cataloging source was the vendor Baker and Taylor. Of the 368 titles searched, 35 (9.51 percent) of the most-held records in WorldCat and 31 (8.42 percent) in SkyRiver were created by Baker and Taylor.

Differences were discovered when comparing record encoding levels (see table 5). SkyRiver has integrated WorldCat’s encoding level terminology. The encoding level dropdown box used in the SkyRiver platform explicitly states “OCLC” and offers OCLC definitions for the various encoding levels. When searching WorldCat, 217 (58.97 percent) of the 368 most-held records analyzed had a blank encoding level, while 255 (69.11 percent) records had a

Table 5. Record Encoding Level

Field	WorldCat		SkyRiver	
	No.	%	No.	%
blank	217	58.97	255	69.11
1	0	0.00	0	0.00
2	0	0.00	0	0.00
3	3	0.82	0	0.00
4	61	16.58	26	7.07
5	0	0.00	0	0.00
6	0	0.00	0	0.00
7	4	1.09	7	1.90
8	7	1.90	13	3.53
u	0	0.00	0	0.00
z	0	0.00	0	0.00
i	59	16.03	50	13.59
k	1	0.27	1	0.27
l	0	0.00	0	0.00
m	10	2.72	8	2.17
e	0	0.00	0	0.00
j	0	0.00	0	0.00

blank encoding level in SkyRiver. As previously mentioned, approximately two-thirds of the WorldCat and the SkyRiver records analyzed may have had the same LC origin. Additionally, of the 368 records analyzed, 61 (16.58 percent) had a “4” encoding level in WorldCat and 26 (7.07 percent) in SkyRiver. The differences are eliminated if the blank and 4-level records are added together (75.55 percent for WorldCat and 76.18 percent for SkyRiver).

Of the 368 titles searched in WorldCat, 260 (70.65 percent) had records that included a table of contents and 137 (37.23 percent) had records that included a summary note (see table 6). In SkyRiver, 273 (74.18 percent) of the 368 titles searched had records that included a table of contents note and 161 (43.75 percent) included a summary note.

While each institution has different priorities when choosing acceptable records, most institutions consider more than a single field when making that choice. Therefore, examples of how the MARC fields analyzed can be combined to help with the decision-making process are provided (see table 7). In WorldCat, 217 (58.96 percent) of the 368 titles searched had records that included a blank encoding level, had a full LC call number, a complete physical description, and at least one LC subject heading. In SkyRiver, 246 (66.85 percent) of 368 titles searched resulted in records that had those same characteristics. When adding the condition of having only one English-language print record among the search results, however, the differences

Table 6. Presence of TOCs and Summaries

Field	WorldCat		SkyRiver	
	No.	%	No.	%
Table of Contents (505)	260	70.65	273	74.18
Summary (520)	137	37.23	161	43.75

between the two databases became more apparent with WorldCat having 146 (39.67 percent) and SkyRiver having 276 (75.00 percent) that fall into that category (see table 7).

Discussion

The goal of this study was to determine whether there are meaningful differences between WorldCat and SkyRiver in terms of hit rate, fullness, and types of records. Overall, there were no noticeable differences in hit rate. The databases for both companies had a greater than 98 percent hit rate; OCLC had only a single title (0.27 percent) more than SkyRiver. This study supports the assertion made by Janes and MSU that the differences in search results are insignificant, despite the size disparity between the two databases.³⁰ According to the results of this study, WorldCat’s larger database (over 300 million records) did not result in a noticeably better hit rate than SkyRiver’s smaller database (over 40 million records) for the sample. This study’s results did run counter to the hit-rate results documented in the minutes of the Chicago area consortium’s administrative meeting or the South Central Library System’s committee meeting. The authors discovered a much higher hit rate (98.64 percent) than the 2:1 ratio or 50–60 percent offered in the minutes.³¹ The reason for this may be that at the time of those studies, SkyRiver was still in the early stages of its evolution; its database has grown rapidly in the past two years.

It was not possible to compare most of the fullness-related results (ISBN, dates, LC call number, physical description, and LC subject headings) of this study with previous studies due to the lack of recent studies available for either database. Overall, there was very little difference between the fullness for the most-held records for the sample in WorldCat and SkyRiver. Nearly half of all records (44.29 percent) were exactly the same for every recorded element, down to the number of LC subjects. As previously noted, approximately 95 percent or more of the records analyzed from both databases had matching ISBNs, matching dates, complete LC call numbers, complete physical descriptions, and the inclusion of LC subject headings. There were no differences for this collection of fullness-related elements. Since approximately three-fourths of the analyzed records in both WorldCat and SkyRiver originated from LC or Baker and Taylor, it is understandable that there would be many

Table 7. Records with Combined Multiple MARC21 Fields

Example 1				Example 2				Example 3			
Any no. of records				Any no. of records				1 Eng.-lang. print record			
"Blank" Encoding level				Any Encoding Level				Any Encoding level			
Full LC Call Number				Full LC Call Number				Full LC Call Number			
Complete Physical Desc.				Complete Physical Desc.				Complete Physical Desc.			
>1 LC Subject Heading				>1 LC Subject Heading				>1 LC Subject Heading			
WorldCat		SkyRiver		WorldCat		SkyRiver		WorldCat		SkyRiver	
Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
217	58.96	246	66.85	351	95.38	334	90.76	146	39.67	276	75.00

records that are essentially identical, regardless in which database they were found.

Because this study focused on a subset of records for each title, the percentage of records created by LC in WorldCat varied greatly from the 8.6 percent stated by the Director of WorldCat Quality Management in his 2009 posting to OCLC-CAT.³² Instead of considering all records in WorldCat as he did, this study analyzed the most-held record for each title in the sample. With this subset, the percentage of LC-created records in WorldCat rose to 66.03 percent, a negligible difference when compared with SkyRiver's results of 65.22 percent. It was not possible to compare this study's SkyRiver results with that of any previous studies.

As was the case for the statistics for LC-created records, this study's encoding level results did not match those previously reported in the OCLC post. While the post reported that 64 percent of all WorldCat records were minimum level records, only 21.48 percent of the analyzed records in the sample from WorldCat were minimum level. Again, the authors attribute the difference to the fact that only the most-held records found for each title were analyzed. Another possible explanation could be the nature of the sample used. It was not possible to compare SkyRiver's encoding results from this study with that of any previous studies.

While this study discovered that the two databases had virtually the same hit rates and record fullness for the sample used—with encoding levels as the sole exception—dramatic differences were discovered when various types or counts of records were compared. Although many libraries in the US, Great Britain, Australia, or any country that follows the Anglo-American Cataloging Rules (AACR2) and/or RDA may be able to utilize SkyRiver for their bibliographic needs, libraries that follow different cataloging rules or need records in a language other than English would likely be better served by WorldCat. OCLC's global focus is evident with over four-fifths (80.43 percent) of all titles searched resulting in at least one record transcribed in a non-English language. However, with OCLC serving 485 languages and

dialects, this study's results of an average of 3.1 non-English records per title suggests that it is possible that not every member library would always find a useable record for their particular needs.³³ Based on the results of this study, WorldCat's inclusion of non-English language records is currently much higher than that for SkyRiver. Out of the 368 titles searched in SkyRiver, only one (0.27 percent) resulted in a non-English language record.

In addition to non-English language records, the authors documented the number of print records, the number of e-book records, and the total number of records found for each searched title. Because only print ISBNs were searched, the documented figures do not represent an accurate depiction of the e-book record composition for either database; instead, the results may indicate the percentages of records for each database where the print ISBNs were included on the e-book records as suggested by the Program for Cooperative Cataloging's (PCC) "Provider-Neutral E-Monograph MARC Record Guide."³⁴ WorldCat had a higher percentage (63.86 percent) of print ISBNs included on e-book records than SkyRiver (51.90 percent).

This documentation of the number and types of records occurred because, as previously mentioned, the authors wanted to test SkyRiver's public statement that "sophisticated matching algorithms minimize duplication and sub-standard records, saving catalogers time and reducing searching frustration."³⁵ However, as many e-book records included print ISBNs, a decision was made to gather statistics for the number of searched titles with one or two records total because the authors' assumption was that SkyRiver should have one record for the print resource and one record for the electronic resource. Again, there was a dramatic difference between the two databases when comparing the percentage of titles that had a total of one or two records for each title searched. Nearly nine-tenths (86.98 percent) of all titles searched in SkyRiver resulted in one or two records. This result was more than four times larger than that found in WorldCat, which had less than one-fifth (19.02 percent) of the searched

titles resulting in only one or two records. Part of the disparity can be accounted for by the fact that WorldCat contains records whose language of cataloging is not English. When non-English records were removed from the comparison, the gap narrowed. After removal, nearly half (45.38 percent) of all titles searched in WorldCat resulted in one or two total English-language records, while SkyRiver's percentage remained approximately the same at 86.68 percent.

Another area of focus was the number of searched titles that resulted in a single English-language print record per title, after removing all non-English and nonprint records from consideration. These figures corresponded consistently with the previous results. Of the 368 titles searched, 43.48 percent in WorldCat resulted in a single English-language print record as compared to 82.61 percent in SkyRiver.

While the number of resulting records in WorldCat ranged from a minimum of 0 and a maximum of 42 records per title, the average number of records resulting from each searched title was 6.56 total records. The searched titles in SkyRiver resulted in a minimum of 0 records and a maximum of 5 records, with an average of 1.81 total records per searched title. Differences in the number of results per searched title can have a tremendous effect on the decision-making process. Some libraries may prefer having more records available from which to choose. Other libraries may prefer having one distinct record per title, or at least fewer records to evaluate during the selection process.

Because the results of this study may factor into libraries' decision-making processes when considering bibliographic services, it is important that any limitations and issues with the research method are clearly outlined. As previously mentioned, unlike Intner's method, the authors did not verify the accuracy of analyzed elements in the records; only their inclusion was measured. This is particularly relevant when discussing encoding levels because that was the single record element with noteworthy differences between the databases.

As previously stated, all searching was done in the same one-week period. Although all searching and record analysis occurred in the same one-week period after the full sample was compiled, many of the titles had been published and available for distribution several months before the searching. All the searched titles in the sample had a gap of at least three months between the publication date and the searching date. It is entirely possible that the results would have been different if the searching had taken place within the same week, or within a few weeks, of each title's publication date. One database may have a faster turn-around time for the inclusion of records that might affect hit rates. Further research is needed to determine whether the two databases differ in how long it takes to include new records and whether that difference significantly affects the hit rate comparison.

The final research-related issues are connected with the sample itself. The sample is in no way representative of library acquisitions at large. Without knowing the exact

scope of the project, the authors chose to limit the sample to print monograph titles to contain any potential issues that might come up with nontraditional formats. E-books, DVDs, streaming videos, audiobooks, music CDs, cartographic materials, and other types of resources were not part of this study. Widening the sample to include more formats or more non-English language materials might have affected the study's results. The majority of the print monograph titles in the sample were scholarly books in English, published within the past four years. Each book was chosen by two specific academic libraries. Public libraries, special libraries, and even other types of academic libraries may have very different acquisitions needs—even in terms of print monographs.

The limited sample necessitates further research with different or larger samples to gain a better understanding of how WorldCat and SkyRiver compare. Further research can focus on factors other than hit rates, types and counts of records, and record fullness. For example, further research will need to be conducted to study the effect of the adoption of RDA. While there are many factors that need to be considered to obtain a more complete picture of the two databases, it is highly recommended that future research focus on functionality, cost, and complementary services offered by each company. When the functionality of WorldCat and SkyRiver were compared by the catalogers at UC-Davis, they reported that SkyRiver was less complicated to learn and more efficient when used with Innovative's Millennium integrated library system (ILS).³⁶ Further research could be done to see if these efficiencies hold true for other libraries, especially those using a different ILS. If OCLC implements the recommendation of its Global Advisory Group on Credits and Incentives to transition its current Financial Credit Program into a subscription pricing model, new cost comparison studies will need to be conducted.³⁷ Complementary services, especially holdings-related services, can be deal-breakers when comparing the two companies and a more holistic comparison should include such services.

Conclusion

There is no meaningful difference between the percentage of records found for each title in WorldCat and SkyRiver for this study's sample. Record fullness was also very similar in each database, possibly because for both databases approximately three-fourths of the most-held records were created by LC or Baker & Taylor. Because of the virtually identical hit rate and record fullness, the results of this study suggest that it may be possible to eliminate these factors from the decision-making process when choosing a vendor. In terms of this study, it may be more prudent to focus on the more pronounced differences between the two databases: the total number of records found per search and the number of records whose language of cataloging is not English. The

figures show that WorldCat is currently much more global in scope than SkyRiver, containing, for many of the titles searched, non-English language records. The results also support the conclusion that SkyRiver is thus far adhering to its implied intention of limiting duplicate records, as approximately nine-tenths of all titles (87 percent) had only one or two records. However, this study is a snapshot that examines the state of each company's database in 2012–13. Given that III, SkyRiver's parent company, has a large international customer base, SkyRiver's database may acquire more non-English records in the future. Studies featuring bibliographic records for other types of materials would be of interest in further determining difference in both quality and quantity between the two companies and their databases.

References

1. "OCLC's presidents," OCLC, accessed May 3, 2013, www.oclc.org/en-US/about/leadership/presidents.html.
2. Judy Janes, "SkyRiver or OCLC?" *Spectrum Online*, November 21, 2011, accessed March 1, 2013, www.aallnet.org/main-menu/Publications/spectrum/Spectrum-Online/skyriver.html.
3. Doris Small Heifer and Helen Heinrich, "OCLC: Is Its Future Up in the Clouds?" *Searcher* 20 no. 2 (2012): 22–23.
4. Brian Kenney, "Being Innovative," *Library Journal* 129, no. 14 (2004): 38–39, accessed May 3, 2013, www.library-journal.com/lj/ljinprintcurrentissue/872626-403/being_innovative.html.csp.
5. Meredith Schwartz and Bob Warburton, "III Drops OCLC Suit, Will Absorb SkyRiver," *Library Journal* 138, no. 6 (2013): 12, accessed May 3, 2013, www.infodocket.com/2013/03/04/innovative-interfaces-integrates-all-skyriver-services-and-withdraws-antitrust-lawsuit-against-oclc.
6. Joshua Barton and Lucas Mak, "SkyRiver at Michigan State University Libraries: A Brief Overview," *ALCTS Newsletter Online* 21, no. 2 (2010), accessed April 25, 2013, www.ala.org/alcts/ano/v21/n2/feat/system.
7. "Frequently Asked Questions," SkyRiver, accessed May 7, 2013, theskyriver.com/faqs.
8. David Rapp, "SkyRiver, Donohue Group Announce Partnership," *Library Journal* 137, no. 2 (2012): 18.
9. "SkyRiver," Innovative Interfaces, accessed April 14, 2014, www.iii.com/products/skyriver.shmtl.
10. "A Global Library Resource," OCLC, accessed May 7, 2013, www.oclc.org/en-US/worldcat/catalog.html; Janes, "SkyRiver or OCLC?"
11. "SkyRiver."
12. Heifer and Heinrich, "OCLC," 22–23.
13. David Bade, "The Perfect Bibliographic Record: Platonic Ideal, Rhetorical Strategy or Nonsense?" *Cataloging & Classification Quarterly* 46, no. 1 (2008): 109–33.
14. Jay Shorten, Michele Seikel, and Janet Ahrberg, "Why Do You Still Use Dewey?" *Library Resources & Technical Services* 49, no. 2 (April 2005): 123–36.
15. Rosemary E. Ross, "A Comparison of OCLC and WLN Hit Rates for Monographs and an Analysis of the Types of Records Retrieved," *Information Technology & Libraries* 12, no.3 (1993): 359–60.
16. Diane Hillman and Christopher Sugnet, "Comparison of OCLC and RLIN: A Question of Quality," *Cataloging & Classification Quarterly* 4, no.1 (1983): 70.
17. Sheila Intner, "Much Ado about Nothing: OCLC and RLIN Cataloging Quality," *Library Journal* 114, no. 2 (1989), 38.
18. *Ibid.*, 39–40.
19. Ross, "Comparison of OCLC and WLN," 355–59.
20. William E. Moen et al., "Catalogers' Use of MARC Content Designation over Time: An Analysis of MARC Records from 1972 to 2004," 8, in *MARC Content Designation Utilization: Inquiry and Analysis*, 2007, accessed September 30, 2013, www.mcdu.unt.edu/wp-content/CatalogersUseOverTime_Final_30Dec2007.pdf.
21. "MARC Usage in WorldCat," OCLC, accessed March 14, 2014, experimental.worldcat.org/marcusage.
22. Glenn Patton, "Posting to OCLC-CAT February 26, 2009," accessed May 7, 2013, <http://listserv.oclc.org/archives/oclc-cat.html>.
23. Barton and Mak, "SkyRiver at Michigan State University Libraries."
24. Janes, "SkyRiver or OCLC?"
25. "SWAN Administrators' Quarterly Meeting Minutes, March 3, 2011," accessed April 25, 2013, www.mls.lib.il.us/swan/archive/2011_3-3_SWAN_Quarterly_Notes.pdf.
26. South Central Library System Wisconsin, "ILS Committee Meeting Minutes, August 1, 2012," accessed April 25, 2013, www.scls.info/committees/ic/minutes/2012-08-01.pdf.
27. "Skyriver."
28. "When to Input a New Record," OCLC, accessed March 14, 2014, www.oclc.org/bibformats/en/input.html#CHDJFHA.
29. "SkyRiver."
30. Janes, "SkyRiver or OCLC?"; Barton and Mak, "SkyRiver at Michigan State University Libraries."
31. "SWAN minutes"; "South Central minutes."
32. Patton, "Posting to OCLC-CAT."
33. "A Global Library Resource," OCLC, accessed March 10, 2014, oclc.org/worldcat/catalog.en.html.
34. Becky Culbertson, Yael Mandelstam, and George Prager, "Provider-Neutral E-Monograph MARC Record Guide," accessed March 10, 2014, www.loc.gov/aba/pcc/bibco/documents/PN-Guide.pdf
35. "SkyRiver."
36. Janes, "SkyRiver or OCLC?"
37. OCLC Global Advisory Group on Credits and Incentives, "Final Report," accessed May 5, 2013, www.oclc.org/content/dam/oclc/councils/global/global-advisory-group-on-credits-and-incentives.pdf.

Notes on Operations

Metadata Makeover

Transforming MARC Records Using XSLT

Violeta Ilik, Jessica Storlien, and Joseph Olivarez

Catalogers have become fluent in information technology such as web design skills, HyperText Markup Language (HTML), Cascading Stylesheets (CSS), eXensible Markup Language (XML), and programming languages. The knowledge gained from learning information technology can be used to experiment with methods of transforming one metadata schema into another using various software solutions. This paper will discuss the use of eXtensible Stylesheet Language Transformations (XSLT) for repurposing, editing, and reformatting metadata. Catalogers have the requisite skills for working with any metadata schema, and if they are excluded from metadata work, libraries are wasting a valuable human resource.

Being a cataloger requires more than knowledge and understanding Machine-Readable Cataloging (MARC) format, the Anglo American Cataloging Rules (AACR2), the Library of Congress Descriptive Cataloging Manual (DCM), Library of Congress Subject Headings Manual (SHM), Library of Congress Classification (LCC), Resource Description and Access (RDA), and other cataloging rules and standards. Cataloging practices must also embrace the opportunity to employ new schemas for resource description and how to reuse and repurpose existing metadata.

In the current library ecosystem, catalogers must be willing to assume new responsibilities to enable information to be organized, repurposed, and shared with patrons and other libraries. A large part of these new responsibilities are grounded in the importance and use of metadata to meet the needs of libraries, including creating interoperable data, repurposing data, and building digital repositories. Catalogers have the fundamental skills to successfully work with and repurpose metadata. These skills include, but are not limited to, organization of information, knowledge of commonly used access points, and a growing knowledge of information technology. Catalogers must also develop fluency in information technology (IT) including HyperText Markup Language (HTML), Cascading Stylesheets (CSS), eXensible Markup Language (XML), Extensible Stylesheet Language Transformations (XSLT), and MARCXML (an XML schema based on MARC21) to expand and reimagine their work. By encouraging catalogers to work with metadata creation and standards and to learn web development skills, libraries are using their resources and staff efficiently. This paper will explain how catalogers with intermediate knowledge of HTML, CSS, and XML can develop

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stylesheets to transform or enhance XML documents.

Literature Review

A survey conducted in 2007 by Ma investigated how metadata was implemented in Association of Research Libraries (ARL) member libraries and revealed that the metadata qualifications and responsibilities required by most responding institutions included knowledge of MARC cataloging, advanced knowledge of metadata crosswalks, and that knowledge of XML and the Open Archives Initiative (OAI) were considered desirable.¹ Park, Lu, and Marion analyzed cataloging position descriptions for vacancies posted on the Autocat discussion list between 2005 and 2006.² Their results revealed that of the required qualifications, computer skills (including, but not limited to, hardware, software, Microsoft Office applications, word processing, spreadsheets, and Microsoft Windows) appeared in 32.1 percent of the postings. Metadata knowledge, including but not limited to, Dublin Core (DC), Encoded Archival Description (EAD), Metadata Object Description Schema (MODS), Text Encoding Initiative (TEI), and Visual Resources Association (VRA) appeared in 23.5 percent of the postings. Web knowledge, including but not limited to, the World Wide Web, HTML, Standard Generalized Markup Language (SGML), XML appeared in 16.3 percent of the postings. Results reveal that advances in technology have created a new realm of desired skills, qualifications and responsibilities for catalogers.

Hseih-Yee asserts that although catalogers may not be involved in writing programming codes, they need sufficient knowledge of the technologies and tools affecting information organization and services to communicate with vendors and systems management units.³ The current trend

is for catalogers to be involved in learning to code through various collaborative venues. Calhoun advocates for librarians to become IT-fluent to better support the future of library information dissemination.⁴

Reese maintains that as more institutions bring collections online, technical services staff will continue to face the growing issue of distributed metadata retrieval.⁵ He further states that technical services departments have viewed metadata harvesting and transformation as the responsibility of library technology departments. He discusses Texas A&M University Libraries' method for metadata repurposing developed by Surratt and Hill in 2004 and notes that data conversion was moved outside the cataloging department, creating a barrier between catalogers and the developers of the script.⁶ Reese is the creator of the free Windows-based MARC editing tool, MarcEdit (marcedit.reeset.net), which can be used in an everyday cataloger's work and provides a means for editing metadata, XML crosswalking, and metadata harvesting via the Open Archive Initiative Protocol for Metadata Harvesting (OAI-PMH). With this tool, Reese proves that new tools and workflows will continue to be developed and more technical services departments will turn to metadata harvest and capture as a viable method of generating metadata for digital collections.⁷

Tosaka stresses the importance of metadata transformation to enable reuse, and he cites the need for additional studies on metadata interoperability and crosswalks.⁸ He also states that the ability to repurpose metadata is important due to the "increasingly global, interdisciplinary environment where users must deal with metadata records from multiple databases with their individual data structures."⁹ Tosaka deduces that collections of malleable, shareable metadata are in demand, and this must be considered by current data-creation standards.¹⁰

The workflow used by the University of Illinois Library "implements the eXtensible Markup Language and Open Archives Initiative-Protocol for Metadata Harvesting to create cataloging records for digitized books."¹¹ The author further makes the point that libraries have to develop these new workflows to be able to keep abreast of the abundance of digitized books produced by mass digitization projects.

Woodley provides these simple definitions for mapping and crosswalks: mapping compares and analyzes two or more metadata schemas while crosswalks are the product of the mapping process.¹² St. Pierre and LaPlant define crosswalks as the "specification for mapping one metadata standard to another."¹³ Metadata crosswalks are central to ensuring seamless access to information from various systems and essential in converting data from one format to another. Woodley points out the enormity of the tasks involved in repurposing metadata, including transforming records from one schema to another and merging records created using different schemas or standards.¹⁴ A similar study, conducted by Rudic and Surla, discusses "the application of the XML technologies for the conversion of the bibliographic records between the different bibliographic formats (YUMARC, UNIMARC and MARC 21)" used in the library system in Serbia.¹⁵

Before initiating a metadata crosswalk, it is important to have an awareness of common issues associated with metadata and crosswalks. According to Dushay and Hillman, the four categories of metadata problems are missing data, incorrect or erroneous data, confusing or inconsistent data, and insufficient data.¹⁶ Woodley states that common issues with migrating data include ambivalent matches, hybrid bibliographic records, data mapping to multiple fields or combining into single fields during migration, orphaned data parsed into incongruous fields, mixed standards in

original data, MARC data loss during the migration, and flat structure versus hierarchical structures.¹⁷ St. Pierre and LaPlant describe similar issues with metadata crosswalks, including reconciling metadata organization systems, choice of unanalogous processes during metadata standards creation, imprecise definitions or alternate naming choices that inhibit element-to-element mapping, information being lost or combined during mapping, and unharmonious hierarchical structures.¹⁸ Godby, Young, and Childress note that a problem with crosswalks is they are not always identified as a standard, and point to the digital library community's opposing views on crosswalks.¹⁹ One view maintains that crosswalks are a stopgap measure, a local and temporary solution, until a single data standard is developed. The other view asserts that crosswalks "represent an attempt to identify interoperable elements among standards"; this implies that crosswalks should become a standard practice.²⁰

According to Chandler and Westbrook, construction of open systems and methods that provide the ability to link between different types of metadata is the path to information discovery.²¹ They also discuss the need for the library technical services departments to be proactive not only in the creation and maintenance of non-MARC metadata, but more importantly, in the development of a means for widely sharing metadata with libraries that require it for resource discovery and access. Ahronheim and Marko cite the need for catalogers to participate in both the development and use of descriptive standards because standards easily allow data to be reused.²² Woodley states, "Consistently recorded, reliable metadata can be reused and combined with metadata records that have been created according to different standards to create richer, more informative information objects."²³ Calhoun concludes that metadata can and should be reused,

and libraries must ensure interoperability of their metadata for this very reason.²⁴

The appeal to create interoperable data has led to a discussion of using XML to manipulate data, including MARC data. Johnson ascertained that XML and HTML standards closely identify with web development, allowing for effective integration with web interfaces.²⁵ XML is inherently hierarchical, web-oriented, works well with web applications, and allows for retrieval and manipulation of data. XML is considered an unencumbered format that facilitates the ability to experiment with library data, for example, transforming MARCXML records into various other schemas. Johnson asserts "XML presents new opportunities and extended life for MARC" because XML can transfer MARC encoded information.²⁶ Due to the dual roles of librarians as information consumers and metadata producers, it seems natural that librarians would influence and participate in the development of XML software and applications. The authors of this paper propose that catalogers who are empowered by library administrators and are encouraged to assume new responsibilities can acquire skills such as programming languages and combine them with existing cataloging expertise to successfully implement metadata projects.

Using XML and XSLT

Catalogers at the Texas A&M University Libraries chose XSLT to manipulate XML records because of its relative ease of use. According to Keith, stylesheets are the ideal format for the maintenance of XML data transformations due to the native adaptability and simplicity of stylesheets.²⁷ No special software is needed to change stylesheets. He further states that because XSLT documents are simple text files, just like XML documents,

they can be edited with word-processing software at the most basic level.

Understanding of HTML and CSS is essential to comprehending XML and XSLT. Tennison states that XML is a meta-markup language specifically designed for ease of use with the web that is human-readable and straightforward for applications to read and understand.²⁸ An XML document written in XSLT is commonly known as an XSLT stylesheet and is usually assigned the file extension .xsl.²⁹ Each XSLT stylesheet describes how a set of XML documents (the source documents) should be converted to other documents (the result documents), whether they are eXtensible Stylesheet Language Formatting Objects (XSL-FO), eXtensible HyperText Markup Language (XHTML), comma-delimited text, or any other text-based format, such as HTML. An XSLT stylesheet will typically take source documents written in one markup language and produce a result in another markup language, which can be used by a specialist application, such as XHTML, for presentation in a browser.³⁰

To perform a transformation, XSLT must be capable of pointing to information in the source document to process the information and include it in the result. XML Path Language (XPath) serves as the guide for XSLT.³¹ The most important role of XPath is to collect information from an XML document by navigating through the document. A good XML editor, such as oXygen, is necessary to experiment and work with XML and XSLT. The Library of Congress (LC) developed the MARCXML architecture and MARCXML toolkit to standardize the exchange of MARC structured data in XML. The core of the MARCXML framework is a simple XML schema that contains MARC data. As stated on the LC website, this base schema output can be used where full MARC records are needed or can act as a "bus" to enable MARC data records to go through further transformations,

such as to DC or processes like validation.³² Control fields, including the leader, are treated as data strings, while variable fields are treated as elements and the tag and indicators are treated as attributes. Subfields are treated as sub-elements with the subfield code as an attribute.

The MARCXML schema provides easy access to discrete pieces of data, such as data stored in the leader, 008, and subfields, and enables the creation of XML stylesheets to manipulate and transform the data.³³ Information is accessed at the subfield level with simple XPath expressions. Many types of transformation exist, such as MARCXML to DC, MODS, or just simple style sheets that allow enhancement of MARCXML files. Keith states that the MARC21 file format is not easy to modify or transform to other schemas, and it is not common for a software developer to understand MARC.³⁴ A well-written specification is required to manipulate MARC metadata. Unlike MARC, XML is simple, although Coyle notes that it allows for the creation of complicated data records.³⁵ She explains XML by comparing it to MARC tags, such as the use of “245,” which in XML would be written as `<title>Title of the book</title>`.

A major difference between MARC and XML is that XML uses brackets to denote the beginning tag `<>` and ending tags `</>`. The tags need to be predefined in a data-format-definition structure. XML is hierarchical, as are MARC tags and subfields. However, XML is potentially more hierarchical as there is no limit to the number of levels, unlike MARC, which is limited in number by the established standard.

Catalogers at Texas A&M University Libraries used the stylesheets available on LC’s Network Development and MARC Standards Office site for the second experiment. As stated on the LC site, “this framework is intended to be flexible and

extensible to allow users to work with MARC data in ways specific to their needs. The framework itself includes many components such as schemas, stylesheets, and software tools.”³⁶ For the purpose of data transformation for sample records from MARCXML to DC, the authors adapted the LC MARCXML to Resource Description Framework (RDF) Encoded Simple DC Stylesheet. The use of this stylesheet produced the DC-RDF file format.

First Experiment: Creation of Bibliographic Records for Electronic Information Resources from Bibliographic Records for the Print Version of the Same Resource

The XSLT for this experiment was created by one of the three authors. As libraries frequently purchase electronic versions of resources owned in print, the authors believed it would save time and money to create MARC records for the electronic resources by reusing the existing metadata stored in the bibliographic records for the print versions. Using a simple XML editor, they created a stylesheet to transform bibliographic records for the print resources to bibliographic records for electronic version of same resources in MARCXML file format (see appendix A). The bibliographic records in MARCXML were transformed through the MarcEdit utility into MARC records ready for import into the local Integrated Library System (ILS).

The authors began by identifying fields in the original bibliographic records that would not be reused. There are several fields used in records for print resources that are unnecessary when describing electronic resources. Other fields that need to be removed are unique record identifiers, such as the OCLC number and the ILS bibliographic number. The command line for the removal of those fields is as follows:

```
<xsl:template match=
"marc:controlfield[@
tag='nnn']"/>
```

After deleting the unnecessary print record fields, the mandatory fields needed in MARC records for electronic resources, such as the 006 and 007 fields, were added.

```
<xsl:template name="t006">
<marc:controlfield tag=
"006">
<marc:subfield code="a">m
o d</marc:subfield>
</marc:controlfield>
</xsl:template>
<xsl:template name="t007">
<marc:controlfield tag=
"007">
<marc:subfield code=
"a">c</marc:subfield>
<marc:subfield
code="b">r</marc:subfield>
</marc:controlfield>
</xsl:template>
```

A command for changing the 008 form of item position to “o” for online was also created.

```
<xsl:template name="t008">
<xsl:variable name="f008"
select="concat(substring(m
arc:controlfield[@tag='008'],
1, 23), 'o', substring(marc:co
ntrolfield[@tag='008'], 25))
"/>
<marc:controlfield tag=
"008">
<xsl:value-of select=
"{$f008}/>
</marc:controlfield>
</xsl:template>
```

Other fields that are recommended for describing electronic books (e-books) were also added, such as the 300 field with the value of “1 online resource” in subfield a, the 588 field with a value of “Description based on print record,” and the 655 field with a value in subfield a of “Electronic

books” and subfield “2” with a value of “local”:

```
<xsl:template name= "t300">
<marc:datafield tag= "300"
ind1= "" ind2="">
  <marc:subfield code="a">
  <xsl:text>1 online
resource</xsl:text>
  </marc:subfield>
</marc:datafield>
</xsl:template>
<xsl:template name= "t588">
<marc:datafield tag= "588"
ind1= ""ind2="">
  <marc:subfield code="a">
  <xsl:text>Description based
on print record.</xsl:text>
  </marc:subfield>
</marc:datafield>
</xsl:template>
<xsl:template name= "t655">
<marc:datafield tag= "655"
ind1= ""ind2="7">
  <marc:subfield code= "a">
  <xsl:text>Electronic
books.</xsl:text>
  </marc:subfield>
  <marc:subfield code="2">
  <xsl:text>local</xsl:text>
  </marc:subfield>
</marc:datafield>
</xsl:template>
```

After transforming the MARC-XML file and creating a new MARC-XML file for e-books, the authors processed the file using MarcEdit software to convert it to a MARC file to import it to the local ILS or to the Online Computer Library Center (OCLC) (see figure 1). The process described above could allow a cataloging department to streamline the creation of thousands of bibliographic record for electronic resources from bibliographic records for print materials the library already holds in the ILS and OCLC.

The transformation made to the bibliographic records for print versions of information resources to bibliographic records for electronic

information resources is shown in appendix B. There are two examples of bibliographic records in appendix B: one for a print information resource (record 1) and one for an electronic information resource (record 2). The changes made to the bibliographic records for print resources are made using the stylesheet referred to in appendix A.

The time used by one of the authors in creating the stylesheet for this first experiment was approximately ten hours over a period of three weeks. The initial learning curve needed for the first stylesheet accounts for time consumed in its creation. With each subsequent stylesheet creation, the time required lessened to a little more than thirty minutes. Once the stylesheet was formatted, we were able to create thousands of new electronic resource bibliographic records in seconds via the transformative ability of the process.

Second Experiment: Transforming Sample MARCXML to Dublin Core Records

The next experiment involved the transformation of XML documents from one schema to another using XSLT, specifically the transformation of MARCXML to DC XML. The authors adapted the existing MARCXML to an RDF Encoded Simple DC Stylesheet, available on the LC website. This section of the paper explains the process and workflow for repurposing metadata.

The authors identified record sets for transformation from XML documents using XSLT. For experimental purposes, the authors selected the collection sets, bypassing consultation with subject selectors or stakeholders, as would be the case when working with a collection identified for digitization and ingestion into the library’s institutional repository. If a record set from the live catalog were being transformed, the collection would

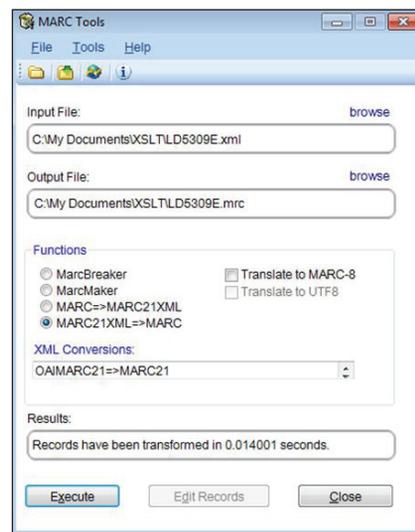


Figure 1. MARC21XML to MARC Conversion

have been first identified by a selector, cleared by the copyright librarian for inclusion in the institutional repository, and then ingested into the repository. As this was an experiment, none of the preparatory steps were necessary.

It is important to note that Texas A&M’s local ILS is a relational database; therefore Microsoft Access was an excellent tool for use in querying the database. After identifying a collection set, an Access report was run to pull data from the local Voyager ILS. Initial queries involved gathering the bibliographic record ID numbers using two tables and limiting by series or call number in a third table. Depending on the collection, one can also run a Binary Large Objects (BLOB) query to search for information in any field of a bibliographic record. By querying the data, the authors obtained OCLC numbers from the 035 subfield a, in records identified in the initial queries as belonging to a collection set and fed them through the OCLC batch processing utility to obtain the desired MARC files from the OCLC database. The authors worked with OCLC records for this specific collection because those records might

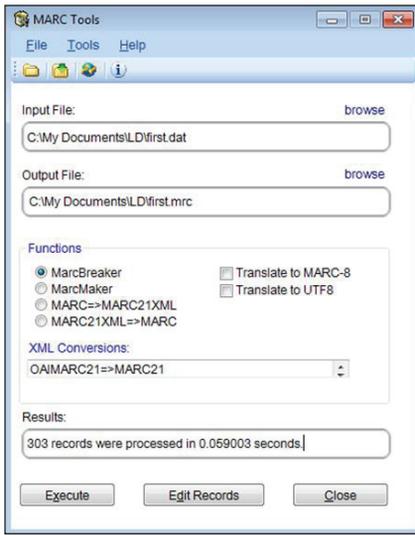


Figure 2. MarcBreaker Function

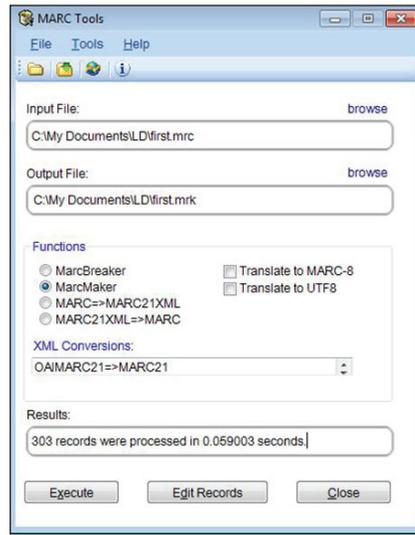


Figure 3. MarcMaker Function

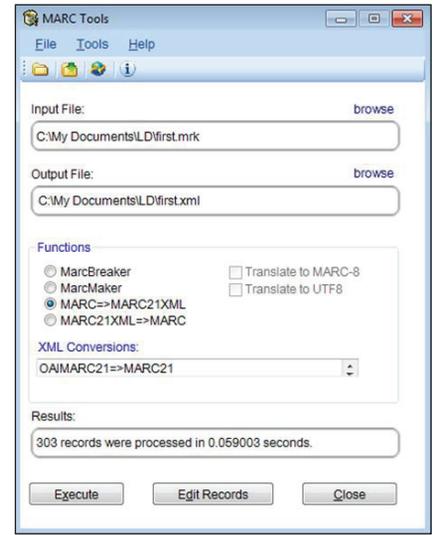


Figure 4. Marc to MARC21XML Function

have been updated or enhanced since first imported into the local ILS, thus potentially conceivably providing richer metadata.

After preparing the MARC files, MarcEdit was used to convert the files into MARCXML documents. The first step was to convert the downloaded OCLC file to MRC file format using the “MarcBreaker” function (see figure 2). The second step created the MARC file in MRK file format with the “MarcMaker” function (see figure 3). The final MarcEdit step was the transformation of the MRK file into XML format with the “MARC=>MARC21XML” function (see figure 4). Once the files were in XML format, the authors experimented with them by applying different stylesheets and transforming them from MARCXML to DC XML files. They used Oxygen software for processing and transforming the metadata.

Each collection had specific requirements, and to meet those requirements and preserve and transform metadata from MARC to DC, the authors tailored stylesheets for each collection. They first created a collection profile to match the local DSpace DC metadata matrix. The next step was the addition of fields that would be the same for every item in a collection.

Table 1. Sample Metadata Profile

MARC field	Dublin Core field
100, 110, 111	dc.creator
245	dc.title
260 subfield c	dc.date.created
260 subfield b	dc.publisher
650 _4 (example: Major Mathematics)	dc.description
500	dc.description
520	dc.description.abstract
Added MARC field 546	dc.language.iso
600	dc.subject.lcsh
650 _4 (example: Major Mathematics)	dc.description
830	dc.relation.isPartOfSeries
In some cases added field (594) with value: “Texas A&M University”	dc.publisher
Added field (590) with value: “text”	dc.type.material
Added field (595) with value: “reformatted digital”	dc.format.digitalOrigin
Added field (596) with value: “electronic”	dc.format.medium

These additional global fields included the following: dc:format.digitalOrigin, dc:format.medium, dc:type.material, dc:type, and dc:language. According to Hillmann, the recommended best practice for the values of the Language element is defined by RFC 3066 which, in conjunction with ISO 639, defines two and three letter primary language tags with optional subtags (see table 1).³⁷ The authors used the

following form: en-US.

The command line for adding the language element in the prescribed format is:

```
<xsl:template match=
"marc:record">
<marc:record>
<xsl:apply-templates/>
<marc:datafield tag= "546">
<marc:subfield code=
```

```
"a">en_US</marc:subfield>
</marc:datafield>
```

Another example for adding a field that applies to all the records from the collection:

```
<marc:datafield tag="590">
  <marc:subfield code="a">
    <xsl:text>text</xsl:text>
  </marc:subfield>
</marc:datafield>
```

The authors selected 5XX fields that were initially omitted from the records to avoid duplication and loss of data.

The next step involved the creation of a stylesheet that mapped MARC data to DC data fields. This would be the actual crosswalk from MARCXML to DCXML. For all the trial collections, the 245 MARC title field was mapped to dc:title, while the 100,110 and 111 field were mapped to dc:creator. Another example of mapping is in the publisher element, where the subfield b from the 260 MARC tag was mapped to dc:publisher. For some collection sets, it made more sense to add a separate field with the name of the institution mapped to dc:publisher element instead of mapping the subfield b from the 260 field to the publisher element. This enabled more uniform and consistent publisher names for all the records, particularly as the authors discovered that the OCLC records were not of a consistently good quality and sometimes needed enhancement. This process could only be used when the authors knew that the publisher was the same for all records in a collection. An example of a collection with the same publisher was the *Annual Budget Reports* for the Texas A&M University System units. In this case, the publisher for the entire collection is the Texas A&M University System. Catalogers also mapped specific subfield data to the DC element that appeared to be

the best fit. An example of this is the 260 subfield c, which was mapped to dc:date.created. The command line for mapping the 260 subfield c to dc:date.created looks like this:

```
<xsl:for-each
  select="marc:datafield[@
  tag=260]">
  <xsl:variable name="date.
  created">
    <xsl:call-template name=
    "subfieldSelect">
      <xsl:with-param name=
      "codes">c</xsl:with-param>
    </xsl:call-template>
    </xsl:variable>
    <dc:date.
    created><xsl:value-of select=
    "substring($date.created,
    1, string-length($date.
    created)-1)"/></dc:date.
    created>
  </xsl:for-each>
```

If the collection had a series statement, the command for mapping that statement to dc:relation.isPartOfSeries element was added.

```
<xsl:for-each select=
"marc:datafield[@tag=830]">
  <xsl:variable name=
  "relation.isPartOfSeries">
    <xsl:call-template name=
    "subfieldSelect">
      <xsl:with-param name=
      "codes">abcdevxyz034</
      xsl:with-param>
    </xsl:call-template>
    </xsl:variable>
    <dc:relation.
    isPartOfSeries><xsl:value-of
    select="substring($relation.
    isPartOfSeries, 1,
    string-length($relation.
    isPartOfSeries)-1)"/></
    dc:relation.isPartOfSeries>
  </xsl:for-each>
```

Every collection profile enumerated each specific metadata element necessary to describe the collection,

and in essence, it served as a personal guide. Some collections benefited from having the 100 field mapped to dc:creator while the 7XX field was mapped to dc:contributor. In some cases that was not a good choice because the authors determined that individual authors would all be considered creators; in those cases the 100 field and all 7XX fields were mapped to dc:creator.

For some collections, the authors experimented with mapping the MARC 650 subfield z, the geographic subdivision, to dc:coverage:

```
<xsl:for-each select=
"marc:datafield[@tag=650]">
  <xsl:variable name=
  "coverage">
    <xsl:call-template name=
    "subfieldSelect">
      <xsl:with-param name=
      "codes">z</xsl:with-param>
    </xsl:call-template>
    </xsl:variable>
    <dc:coverage><xsl:value-of
    select=
    "substring($coverage, 1,
    string-length($place)-1)"/></
    dc:coverage>
  </xsl:for-each>
```

This could not be applied to all collection sets, but for some, such as the *Annual Budget Reports* set, it was possible. Not all parts of every MARC record in a collection were mapped to the full DC schema in this experiment. For example, the linking field 776 (additional physical form) and other 7XX fields were not mapped to the dc:relation element.

The process of transforming MARCXML to DC records initially was a two-step process. The first step enhanced the MARCXML file with additional fields using one stylesheet and the next step transformed the enhanced MARCXML into DC using another stylesheet. Over the course of the project, the authors learned that they could combine these separate

steps into one process. They created a new stylesheet that provided both enhancement and transformation of the original MARCXML file (see appendix C). This stylesheet could be modified according to the needs of each collection.

The issue with crosswalking metadata from a schema with high granularity such as MARC to a less granular schema like DC is that the loss of bibliographic content and context is unavoidable. Reese notes that metadata of lower granularity cannot easily be moved to schemas with higher granularity because content and context cannot be manufactured if they are not present in the original record.³⁸ For this reason, the authors added fields to the MARCXML file that are equivalent across the whole collection by applying a transformation scenario through XSLT. Examples of added fields are the language field, the MARC 590 field with value “text” mapped to `dc:type.material`, or the MARC 591 field with a value “reformatted digital” mapped to `datafield dc:format.digitalOrigin`. This solution may not be perfect, but it was accomplished easily by using a stylesheet customized for each collection set. Careful analysis of content before the construction of a stylesheet for a collection enabled identification of fields that would be appropriate for all records. The number of additional global fields across a collection varied; up to ten were added for some collection sets.

The technical staff from the Digital Initiatives Department confirmed that the DC Resource Description Framework (DC-RDF) format is acceptable for ingestion of records into DSpace, Texas A&M University Libraries’ institutional repository software. Initial experiments described in this paper proved to be successful, leading to inclusion of the Cataloging Department in metadata creation for the institutional repository.

One cataloger adjusted the

stylesheets available on the LC’s Network Development and MARC Standard Office site. The customization of the stylesheets for this experiment took five hours. Using this stylesheet, one thousand records were transformed from MARCXML format to DC XML format in less than a minute.

Discussion

Considering the fact that this work is duplicative within the institution and across the profession and within libraries at large, utilizing XSLT and similar programming languages plus tools that help with automating much of the processes is more than welcome. Automating these processes and the time saved by doing so cannot compare with the manual creation of either electronic equivalent of print records or equivalents in different metadata schema. As demonstrated in this paper, the authors created thousands of records within minutes using stylesheets that required five to ten hours to develop. The creation of a new basic record by cloning an existing record within an ILS can take several minutes, and using stylesheets to create thousands records can result in substantial savings in staff time. It should be noted that the authors are now re-using and adapting the same stylesheets, and therefore do not need to spend time creating new stylesheets each time. Simple modifications and adjustments to the existing ones take an insignificant amount of time.

Conclusion

Catalogers have the potential to undertake metadata projects by active participation in the transformation of MARCXML file format into DC XML or other metadata file formats. The authors, all catalogers, demonstrated that enhancement to MARCXML is possible with XSLT, and that creation

of a MARCXML file format for electronic bibliographic records from print bibliographic records can be easily accomplished using XSLT stylesheets.

The authors also demonstrated that a crosswalk of records to another metadata schema, DC in this case, is simplified with XSLT. Catalogers’ knowledge and understanding of metadata trends and various schemas should be utilized in the transformation and repurposing of existing metadata stored in MARC records. Library managers should encourage catalogers to learn programming languages and how to use free, open-source tools such as MarcEdit. They should also encourage similar projects that could reduce expensive data entry by transforming and reusing existing metadata. Essential skills for these transformations are an awareness of the importance of the use of established standards and of consistency and precision in data entry. Catalogers already possess those skills. With the inclusion of catalogers in metadata projects for institutional repositories, library administrators utilize valuable partners with requisite skill sets.

References

1. Jin Ma, “Metadata in ARL Libraries: A Survey of Metadata Practices,” *Journal of Library Metadata* 9, no. 1–2 (2009): 1–14, 2013.
2. Jung-ran Park, Caimei Lu, and Linda Marion, “Cataloging Professionals in the Digital Environment: A Content Analysis of Job Descriptions,” *Journal of the American Society for Information Science & Technology* 60, no. 4 (2009): 844–57, [dx.doi.org/10.1002/asi.21007](https://doi.org/10.1002/asi.21007).
3. Ingrid Hsieh-Yee, “Educating Cataloging Professionals in a Changing Information Environment,” *Journal of Education for Library & Information Science* 49, no. 2 (2008): 93–106, accessed May 3, 2013, www.jstor.org/stable/40323778.
4. Karen Calhoun, “Being a Librarian:

- Metadata and Metadata Specialists in the Twenty-First Century,” *Library Hi Tech* 25, no. 2 (2007): 174–87, dx.doi.org/10.1108/07378830710754947.
5. Terry Reese, “Automated Metadata Harvesting: Low-Barrier MARC Record Generation from OAI-PMH Repository Stores Using MarcEdit,” *Library Resources & Technical Services* 53, no. 2 (2009): 121–34, dx.doi.org/10.5860/lrts.53n2.121.
 6. Ibid.
 7. Ibid.
 8. Yuji Tosaka, “Analyzing Library Metadata for Web-Based Metadata Reuse Services: A Case-Study Examination of WorldCat.org and RefWorks,” *Journal of Library Metadata* 10, no. 4 (2010): 257–75, dx.doi.org/10.1080/19386389.2010.524864.
 9. Ibid.
 10. Ibid.
 11. Myung-Ja Han, “Creating Metadata for Digitized Books: Implementing XML and OAI-PMH in Cataloging Workflow,” *Journal of Library Metadata* 11, no. 1 (2011):19–32, dx.doi.org/10.1080/19386389.2011.545001.
 12. Mary S. Woodley et al., “Crosswalks, Metadata Harvesting, Federated Searching, Metasearching: Using Metadata to Connect Users and Information,” in *Introduction to Metadata*, online edition, version 3.0 (Los Angeles: J. Paul Getty Trust, 2008), accessed July, 2013, <http://scholarworks.csun.edu/bitstream/handle/10211.2/2001/WoodleyMary200803.pdf?sequence=1>.
 13. Margaret St. Pierre and William P. LaPlant Jr., “Issues in Crosswalking Content Metadata Standards,” (white paper, National Information Standards Organization (NISO), Bethesda, MD, 1998), accessed May 3, 2013, www.niso.org/publications/white_papers/crosswalk.
 14. Woodley, “Crosswalks.”
 15. Gordana Rudic and Dusan Surila, “Conversion of Bibliographic Records to MARC 21 Format,” *Electronic Library* 27, no. 6 (2009): 950–67, dx.doi.org/10.1108/02640470911004057.
 16. Naomi Dushay and Diane I. Hillman, “Analyzing Metadata for Effective Use and Re-use,” in *Proceedings of the 2003 International Conference on Dublin Core and Metadata Applications: Supporting Communities of Discourse and Practice—Metadata Research & Applications* (n.p.: Dublin Core Metadata Initiative, 2003) : 1-10, accessed July 30, 2013, <http://dl.acm.org/citation.cfm?id=1383296.1383318>.
 17. Woodley, “Crosswalks.”
 18. St. Pierre and LaPlant, “Issues in Crosswalking Content Metadata Standards.”
 19. Carol Jean Godby, Jeffrey A. Young, and Eric Childress, “A Repository of Metadata Crosswalks,” *D-Lib Magazine* 10, no. 12 (2004), accessed May 3, 2013, www.dlib.org/dlib/december04/godby/12godby.html.
 20. Ibid.
 21. Adam Chandler, and Elaine L. Westbrook, “Distributing Non-MARC Metadata: The CUGIR Metadata Sharing Project,” *Library Collections, Acquisitions & Technical Services* 26, no. 3 (2002): 207, dx.doi.org/10.1016/S14649055(02)00247-6.
 22. Judith Ahronheim and Marko Lynn, “Exploding Out of the MARC Box: Building New Roles for Cataloging Departments,” *Cataloging & Classification Quarterly* 30, no. 2–3 (2000): 216–25.
 23. Woodley, “Crosswalks.”
 24. Calhoun, “Being a Librarian,” 178.
 25. Bruce Chr. Johnson, “XML and MARC: Which is ‘Right?’” *Cataloging & Classification Quarterly* 32, no. 1 (2001): 81–90, dx.doi.org/10.1300/J104v32n01_07.
 26. Ibid.
 27. Corey Keith, “Using XSLT to Manipulate MARC Metadata,” *Library Hi Tech* 22, no. 2 (2004): 122–30.
 28. Jeni Tennison, *Beginning XSLT 2.0: From Novice to Professional* (Berkeley, CA : Apress, 2005), 50.
 29. Ibid.
 30. Ibid.
 31. W3C, “XML Path Language (XPath) 2.0 (Second Edition),” accessed April 11, 2014, www.w3.org/TR/xpath.
 32. Library of Congress, Network Development and MARC Standards Office, “MARCXML,” accessed July 30, 2013, www.loc.gov/standards/marcxml.
 33. Keith, “Using XSLT to Manipulate MARC Metadata.”
 34. Ibid.
 35. Karen Coyle, “Understanding Metadata and Its Purpose,” *Journal of Academic Librarianship* 31, no. 2 (2005): 160–63.
 36. Library of Congress, Network Development and MARC Standards Office, “MARCXML.”
 37. Diane Hillmann, “Using Dublin Core—The Elements,” Dublin Core Metadata Initiative, November 2005, accessed August, 3, 2013, <http://dublincore.org/documents/usageguide/elements.shtml>.
 38. Terry Reese, “Automated Metadata Harvesting.”

Appendix A. XSLT for Creation of Bibliographic Records for Electronic Information Resources from Bibliographic Records for the Print Version of the Same Resource

```

<?xml version="1.0"?>
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:marc="http://www.loc.gov/MARC21/slim"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <xsl:output method="xml" indent="yes"/>
  <xsl:strip-space elements="*" />

  <!-- Output all elements verbatim -->
  <xsl:template match="*">
    <xsl:for-each select="marc:record">
      <xsl:element name="{name()}" namespace="http://www.loc.gov/MARC21/slim">
        <xsl:apply-templates select="@*" />
        <xsl:apply-templates />
      </xsl:element>
    </xsl:template>

    <!-- and all attributes -->
    <xsl:template match="@*">
      <xsl:attribute name="{name()}">
        <xsl:value-of select="."/>
      </xsl:attribute>
    </xsl:template>

    <!--
      remove a field
    -->
    <xsl:template match="marc:controlfield[@tag='001']"/>
    <xsl:template match="marc:controlfield[@tag='003']"/>
    <xsl:template match="marc:controlfield[@tag='005']"/>
    <xsl:template match="marc:datafield[@tag='029']"/>
    <xsl:template match="marc:datafield[@tag='035']"/>
    <xsl:template match="marc:datafield[@tag='300']"/>
    <xsl:template match="marc:datafield[@tag='776']"/>
    <xsl:template match="marc:datafield[@tag='891']"/>
    <xsl:template match="marc:datafield[@tag='850']"/>

    <xsl:template match="marc:record">
      <marc:record>
        <xsl:apply-templates select="marc:leader"/>
        <xsl:call-template name="t006"/>
        <xsl:call-template name="t007"/>
        <xsl:call-template name="t008"/>
        <xsl:apply-templates select="marc:controlfield[@tag &gt; '008']"/>
        <xsl:apply-templates select="marc:datafield[@tag &lt; '245']"/>
        <xsl:apply-templates select="marc:datafield[@tag='245']"/>
        <xsl:apply-templates select="marc:datafield[(@tag &gt; '245') and (@tag &lt; '300')]" />
        <xsl:call-template name="t300"/>

```

```

<xsl:apply-templates select="marc:datafield[(@tag &gt; '300') and (@tag &lt; '588')]" />
<xsl:call-template name="t588" />
<xsl:apply-templates select="marc:datafield[(@tag &gt; '588') and (@tag &lt; '700')]" />
<xsl:call-template name="t655" />
<xsl:apply-templates select="marc:datafield[(@tag &gt; '655') and (@tag &lt; '856')]" />
<xsl:call-template name="t856" />
<xsl:apply-templates select="marc:datafield[@tag &gt; '856']" />
</marc:record>
</xsl:template>

```

```

<xsl:template name="t006">
  <marc:controlfield tag="006">
    <marc:subfield code="a"> m d </marc:subfield>
  </marc:controlfield>
</xsl:template>

```

```

<xsl:template name="t007">
  <marc:controlfield tag="007">
    <marc:subfield code="a"> c </marc:subfield>
    <marc:subfield code="b"> r </marc:subfield>
  </marc:controlfield>
</xsl:template>

```

```

<xsl:template name="t008">
  <xsl:variable name="f008" select="concat(substring(marc:controlfield[@tag='008'],1,23),'o',substring(marc:controlfield[@tag='008'],25))" />
  <marc:controlfield tag="008">
    <xsl:value-of select="$f008" />
  </marc:controlfield>
</xsl:template>

```

```

<xsl:template match="marc:datafield[@tag='245']">
  <xsl:variable name="i1" select="@ind1" />
  <xsl:variable name="i2" select="@ind2" />
  <xsl:variable name="f245a" select="marc:subfield[@code='a']" />
  <xsl:variable name="f245a_endpunc" select="substring($f245a,string-length($f245a))" />
  <xsl:variable name="f245b" select="marc:subfield[@code='b']" />
  <xsl:variable name="f245c" select="marc:subfield[@code='c']" />
  <marc:datafield tag="245" ind1="{i1}" ind2="{i2}">

```

```

  <xsl:choose>
    <xsl:when test="$f245a_endpunc = '.'">
      <marc:subfield code='a'>
        <xsl:value-of select="substring($f245a,1,string-length($f245a)-1)" />
      </marc:subfield>
      <marc:subfield code='h'>
        <xsl:text>[electronic resource]</xsl:text>
        <xsl:value-of select="$f245a_endpunc" />
      </marc:subfield>
    </xsl:when>

```

```

    <xsl:when test="$f245a_endpunc = '/' or $f245a_endpunc = '!:">
      <marc:subfield code='a'>

```

```

    <xsl:value-of select="substring($f245a,1,string-length($f245a)-2)"/>
  </marc:subfield>

  <marc:subfield code='h'>
    <xsl:value-of select="concat('[electronic resource]', ' ', $f245a_endpunc)"/>
  </marc:subfield>
</xsl:when>
</xsl:choose>
<xsl:if test="$f245b">
  <marc:subfield code='b'>
    <xsl:value-of select="$f245b"/>
  </marc:subfield>
</xsl:if>
<xsl:if test="$f245c">
  <marc:subfield code='c'>
    <xsl:value-of select="$f245c"/>
  </marc:subfield>
</xsl:if>
</marc:datafield>
</xsl:template>

<xsl:template name="t300">
  <marc:datafield tag="300" ind1="" ind2="">
    <marc:subfield code="a">
      <xsl:text>1 online resource</xsl:text>
    </marc:subfield>
  </marc:datafield>
</xsl:template>

<xsl:template name="t588">
  <marc:datafield tag="588" ind1="" ind2="">
    <marc:subfield code="a">
      <xsl:text>Description based on print record.</xsl:text>
    </marc:subfield>
  </marc:datafield>
</xsl:template>

<xsl:template name="t655">
  <marc:datafield tag="655" ind1="" ind2="7">
    <marc:subfield code="a">
      <xsl:text>Electronic books.</xsl:text>
    </marc:subfield>
    <marc:subfield code="2">
      <xsl:text>local</xsl:text>
    </marc:subfield>
  </marc:datafield>
</xsl:template>

<xsl:template name="t856">
  <marc:datafield tag="856" ind1="4" ind2="0">
    <marc:subfield code="u">
      <xsl:text>http://digital.library.tamu.edu/digital-collections/texasfarmer/texas-farmer.html</xsl:text>
    </marc:subfield>

```

```

</marc:datafield>
</xsl:template>

</xsl:stylesheet>

```

Appendix B. Transformation Made to Bibliographic Records for Print Versions of Information Resources to Bibliographic Records for Electronic Information Resources

Record 1

```

</marc:record>
<marc:record>
<marc:leader>01238cas a22003377a 4500</marc:leader>
<marc:controlfield tag="001">ocm14108790 </marc:controlfield>
<marc:controlfield tag="003">OCoLC</marc:controlfield>
<marc:controlfield tag="005">20120503040056.0</marc:controlfield>
<marc:controlfield tag="008">860819c18939999txudx ne 0 a0eng c</marc:controlfield>
<marc:datafield tag="010" ind1=" " ind2=" ">
<marc:subfield code="a">sn 86088544 </marc:subfield>
</marc:datafield>
<marc:datafield tag="040" ind1=" " ind2=" ">
<marc:subfield code="a">PPM</marc:subfield>
<marc:subfield code="c">PPM</marc:subfield>
<marc:subfield code="d">NSD</marc:subfield>
<marc:subfield code="d">OCLCQ</marc:subfield>
</marc:datafield>
<marc:datafield tag="022" ind1="1" ind2=" ">
<marc:subfield code="a">1055-4726</marc:subfield>
<marc:subfield code="1">1055-4726</marc:subfield>
<marc:subfield code="2">1</marc:subfield>
</marc:datafield>
<marc:datafield tag="032" ind1=" " ind2=" ">
<marc:subfield code="a">045360</marc:subfield>
<marc:subfield code="b">USPS</marc:subfield>
</marc:datafield>
<marc:datafield tag="035" ind1=" " ind2=" ">
<marc:subfield code="a">(OCoLC)14108790</marc:subfield>
</marc:datafield>
<marc:datafield tag="042" ind1=" " ind2=" ">
<marc:subfield code="a">pcc</marc:subfield>
<marc:subfield code="a">nsdp</marc:subfield>
</marc:datafield>
<marc:datafield tag="049" ind1=" " ind2=" ">
<marc:subfield code="a">TXAM</marc:subfield>
</marc:datafield>
<marc:datafield tag="130" ind1="0" ind2=" ">
<marc:subfield code="a">Battalion (College Station, Tex. : 1893)</marc:subfield>
</marc:datafield>
<marc:datafield tag="222" ind1=" " ind2="4">
<marc:subfield code="a">The Battalion</marc:subfield>
<marc:subfield code="b">(College Station, Tex. 1893)</marc:subfield>
</marc:datafield>
<marc:datafield tag="245" ind1="0" ind2="4">

```

```

<marc:subfield code="a">The battalion.</marc:subfield>
</marc:datafield>
<marc:datafield tag="246" ind1="1" ind2="0">
<marc:subfield code="a">Texas A&M battalion</marc:subfield>
</marc:datafield>
<marc:datafield tag="260" ind1=" " ind2=" ">
<marc:subfield code="a">College Station, Tex. :</marc:subfield>
<marc:subfield code="b">The Austin and Calliopean Literary Societies,</marc:subfield>
<marc:subfield code="c">1893-</marc:subfield>
</marc:datafield>
<marc:datafield tag="265" ind1=" " ind2=" ">
<marc:subfield code="a">The Battalion, 230 Reed McDonald, Texas A&M University, College Station, TX 77843</
marc:subfield>
</marc:datafield>
<marc:datafield tag="300" ind1=" " ind2=" ">
<marc:subfield code="a">v. :</marc:subfield>
<marc:subfield code="b">ill ;</marc:subfield>
<marc:subfield code="c">40 cm.</marc:subfield>
</marc:datafield>
<marc:datafield tag="310" ind1=" " ind2=" ">
<marc:subfield code="a">Daily (weekdays except holidays, exam periods; Tues.-Fri. in summer),</marc:subfield>
<marc:subfield code="b">&lt;Jan. 25, 1991-&gt;</marc:subfield>
</marc:datafield>
<marc:datafield tag="321" ind1=" " ind2=" ">
<marc:subfield code="a">Monthly,</marc:subfield>
<marc:subfield code="b">1893-19</marc:subfield>
</marc:datafield>
<marc:datafield tag="362" ind1="0" ind2=" ">
<marc:subfield code="a">Vol. 1, no. 1 (Oct. 1, 1893)-</marc:subfield>
</marc:datafield>
<marc:datafield tag="500" ind1=" " ind2=" ">
<marc:subfield code="a">At head of title, &lt;Jan. 25, 1991-&gt;; Texas A&M.</marc:subfield>
</marc:datafield>
<marc:datafield tag="752" ind1=" " ind2=" ">
<marc:subfield code="a">United States</marc:subfield>
<marc:subfield code="b">Texas</marc:subfield>
<marc:subfield code="c">Brazos</marc:subfield>
<marc:subfield code="d">College Station.</marc:subfield>
</marc:datafield>
<marc:datafield tag="780" ind1="0" ind2="0">
<marc:subfield code="t">College journal</marc:subfield>
<marc:subfield code="w">(DLC)sn 88083304</marc:subfield>
<marc:subfield code="w">(OCoLC)17497658</marc:subfield>
</marc:datafield>
<marc:datafield tag="936" ind1=" " ind2=" ">
<marc:subfield code="a">Vol. 90, no. 80 (Friday, Jan. 25, 1991) LIC</marc:subfield>
</marc:datafield>
<marc:datafield tag="994" ind1=" " ind2=" ">
<marc:subfield code="a">C0</marc:subfield>
<marc:subfield code="b">TXA</marc:subfield>
</marc:datafield>
</marc:record>

```

Record 2

```

<marc:record>
  <marc:leader>01238cas a22003377a 4500</marc:leader>
  <marc:controlfield tag="006">
    <marc:subfield code="a">m d</marc:subfield>
  </marc:controlfield>
  <marc:controlfield tag="007">
    <marc:subfield code="a">c</marc:subfield>
    <marc:subfield code="b">r</marc:subfield>
  </marc:controlfield>
  <marc:controlfield tag="008">860819c18939999txudx neo 0 a0eng c</marc:controlfield>
  <marc:datafield tag="010" ind1=" " ind2=" ">
    <marc:subfield code="a">sn 86088544 </marc:subfield>
  </marc:datafield>
  <marc:datafield tag="040" ind1=" " ind2=" ">
    <marc:subfield code="a">PPM</marc:subfield>
    <marc:subfield code="c">PPM</marc:subfield>
    <marc:subfield code="d">NSD</marc:subfield>
    <marc:subfield code="d">OCLCQ</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="022" ind1="1" ind2=" ">
    <marc:subfield code="a">1055-4726</marc:subfield>
    <marc:subfield code="1">1055-4726</marc:subfield>
    <marc:subfield code="2">1</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="032" ind1=" " ind2=" ">
    <marc:subfield code="a">045360</marc:subfield>
    <marc:subfield code="b">USPS</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="042" ind1=" " ind2=" ">
    <marc:subfield code="a">pcc</marc:subfield>
    <marc:subfield code="a">nsdp</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="049" ind1=" " ind2=" ">
    <marc:subfield code="a">TXAM</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="130" ind1="0" ind2=" ">
    <marc:subfield code="a">Battalion (College Station, Tex. : 1893)</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="222" ind1=" " ind2="4">
    <marc:subfield code="a">The Battalion</marc:subfield>
    <marc:subfield code="b">(College Station, Tex. 1893)</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="245" ind1="0" ind2="4">
    <marc:subfield code="a">The battalion</marc:subfield>
    <marc:subfield code="h">[electronic resource].</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="246" ind1="1" ind2="0">
    <marc:subfield code="a">Texas A&M battalion</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="260" ind1=" " ind2=" ">
    <marc:subfield code="a">College Station, Tex. :</marc:subfield>
    <marc:subfield code="b">The Austin and Calliopean Literary Societies,</marc:subfield>

```

```

    <marc:subfield code="c">1893-</marc:subfield>
</marc:datafield>
<marc:datafield tag="265" ind1=" " ind2=" ">
    <marc:subfield code="a">The Battalion, 230 Reed McDonald, Texas A&M University, College Station, TX 77843</
marc:subfield>
</marc:datafield>
<marc:datafield tag="300" ind1="" ind2="">
    <marc:subfield code="a">1 online resource</marc:subfield>
</marc:datafield>
<marc:datafield tag="310" ind1=" " ind2=" ">
    <marc:subfield code="a">Daily (weekdays except holidays, exam periods; Tues.-Fri. in summer),</marc:subfield>
    <marc:subfield code="b">&lt;Jan. 25, 1991-&gt;</marc:subfield>
</marc:datafield>
<marc:datafield tag="321" ind1=" " ind2=" ">
    <marc:subfield code="a">Monthly,</marc:subfield>
    <marc:subfield code="b">1893-19</marc:subfield>
</marc:datafield>
<marc:datafield tag="362" ind1="0" ind2=" ">
    <marc:subfield code="a">Vol. 1, no. 1 (Oct. 1, 1893)-</marc:subfield>
</marc:datafield>
<marc:datafield tag="500" ind1=" " ind2=" ">
    <marc:subfield code="a">At head of title, &lt;Jan. 25, 1991-&gt;; Texas A&M.</marc:subfield>
</marc:datafield>
<marc:datafield tag="588" ind1="" ind2="">
    <marc:subfield code="a">Description based on print record.</marc:subfield>
</marc:datafield>
<marc:datafield tag="655" ind1="" ind2="7">
    <marc:subfield code="a">Electronic books.</marc:subfield>
    <marc:subfield code="2">local</marc:subfield>
</marc:datafield>
<marc:datafield tag="752" ind1=" " ind2=" ">
    <marc:subfield code="a">United States</marc:subfield>
    <marc:subfield code="b">Texas</marc:subfield>
    <marc:subfield code="c">Brazos</marc:subfield>
    <marc:subfield code="d">College Station.</marc:subfield>
</marc:datafield>
<marc:datafield tag="780" ind1="0" ind2="0">
    <marc:subfield code="t">College journal</marc:subfield>
    <marc:subfield code="w">(DLC)sn 88083304</marc:subfield>
    <marc:subfield code="w">(OCoLC)17497658</marc:subfield>
</marc:datafield>
<marc:datafield tag="856" ind1="4" ind2="0">
    <marc:subfield code="u">http://digital.library.tamu.edu/digital-collections/texasfarmer/texas-farmer.html</marc:subfield>
</marc:datafield>
<marc:datafield tag="936" ind1=" " ind2=" ">
    <marc:subfield code="a">Vol. 90, no. 80 (Friday, Jan. 25, 1991) LIC</marc:subfield>
</marc:datafield>
<marc:datafield tag="994" ind1=" " ind2=" ">
    <marc:subfield code="a">C0</marc:subfield>
    <marc:subfield code="b">TXA</marc:subfield>
</marc:datafield>
</marc:record>

```

Appendix C. Stylesheet to enhance and transform original MARCXML file

```

<xsl:stylesheet xmlns:marc="http://www.loc.gov/MARC21/slim"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  version="2.0" exclude-result-prefixes="marc">
  <xsl:import href="MARC21slimUtils.xsl"/>
  <xsl:output method="xml" indent="yes"/>

  <xsl:template match="/">
    <rdf:RDF>
      <xsl:apply-templates/>
    </rdf:RDF>
  </xsl:template>
  <xsl:template match="marc:record">
    <xsl:variable name="leader" select="marc:leader"/>
    <xsl:variable name="leader6" select="substring($leader,7,1)"/>
    <xsl:variable name="leader7" select="substring($leader,8,1)"/>
    <xsl:variable name="controlField008" select="marc:controlfield[@tag=008]"/>

    <rdf:Description>
      <xsl:for-each
        select="marc:datafield[@tag=120]">
        <dc:id>
          <xsl:value-of select="."/>
        </dc:id>
      </xsl:for-each>

      <xsl:for-each select="marc:datafield[@tag=245]">
        <xsl:variable name="title">
          <xsl:call-template name="subfieldSelect">
            <xsl:with-param name="codes">abfghk</xsl:with-param>
          </xsl:call-template>
        </xsl:variable>
        <dc:title><xsl:value-of select="substring($title,1,string-length($title)-1)"/></dc:title>
      </xsl:for-each>

      <xsl:for-each
        select="marc:datafield[@tag=246]">
        <dc:title.alternative>
          <xsl:value-of select="."/>
        </dc:title.alternative>
      </xsl:for-each>

      <xsl:for-each
        select="marc:datafield[@tag=110]|marc:datafield[@tag=111]">
        <dc:creator>
          <xsl:value-of select="."/>
        </dc:creator>
      </xsl:for-each>

      <xsl:for-each
        select="marc:datafield[@tag=700]|marc:datafield[@tag=711]|marc:datafield[@tag=720]">
        <dc:contributor>
          <xsl:value-of select="."/>

```

```

    </dc:contributor>
  </xsl:for-each>

  <dc:type>
    <xsl:if test="$leader7='c'">
      <xsl:text>collection</xsl:text>

    </xsl:if>
    <xsl:if test="$leader6='d' or $leader6='f' or $leader6='p' or $leader6='t'">

      <xsl:text>student project</xsl:text>
    </xsl:if>
    <xsl:choose>
      <xsl:when test="$leader6='a' or $leader6='t'">text</xsl:when>
      <xsl:when test="$leader6='e' or $leader6='f'">cartographic</xsl:when>
      <xsl:when test="$leader6='c' or $leader6='d'">notated music</xsl:when>
      <xsl:when test="$leader6='i' or $leader6='j'">sound recording</xsl:when>
      <xsl:when test="$leader6='k'">still image</xsl:when>
      <xsl:when test="$leader6='g'">moving image</xsl:when>
      <xsl:when test="$leader6='r'">three dimensional object</xsl:when>
      <xsl:when test="$leader6='m'">software, multimedia</xsl:when>
      <xsl:when test="$leader6='p'">mixed material</xsl:when>
    </xsl:choose>
  </dc:type>
  <xsl:for-each select="marc:datafield[@tag=655]">
    <dc:type>
      <xsl:value-of select="."/>
    </dc:type>
  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=100]">
    <xsl:variable name="creator">
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">a</xsl:with-param>
      </xsl:call-template>
    </xsl:variable>
    <dc:creator><xsl:value-of select="substring($creator,1,string-length($creator)-1)"/>
  </dc:creator>
  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=260]">
    <xsl:variable name="date.created">
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">c</xsl:with-param>
      </xsl:call-template>
    </xsl:variable>
    <dc:date.created><xsl:value-of select="substring($date.created,1,string-length($date.created)-1)"/></dc:date.created>
  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=300]">
    <dc.description>
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">ab</xsl:with-param>
      </xsl:call-template>
    </dc.description>
  </xsl:for-each>

```

```

    </dc.description>
  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=500]">
    <xsl:variable name="description">
      <xsl:analyze-string select="marc:subfield[@code='a']" regex="(\w*)\s*process">
        <xsl:matching-substring>Printing process for original image: <xsl:value-of select="regex-group(1)"/> process.</
xsl:matching-substring>
        <xsl:non-matching-substring><xsl:value-of select="."/></xsl:non-matching-substring>
      </xsl:analyze-string>
    </xsl:variable>
    <dc.description><xsl:value-of select="substring($description,1,string-length($description)-1)"/></dc.description>
  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=502]">
    <dc.type.genre>
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">a</xsl:with-param>
      </xsl:call-template>
    </dc.type.genre>
  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=504]">
    <xsl:variable name="description">
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">a</xsl:with-param>
      </xsl:call-template>
    </xsl:variable>
    <dc.description><xsl:value-of select="substring($description,1,string-length($description)-1)"/></dc.description>

  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=515]">
    <xsl:variable name="description">
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">a</xsl:with-param>
      </xsl:call-template>
    </xsl:variable>
    <dc.description><xsl:value-of select="substring($description,1,string-length($description)-1)"/></dc.description>

  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=520]">
    <xsl:variable name="description.abstract">
      <xsl:call-template name="subfieldSelect">
        <xsl:with-param name="codes">a</xsl:with-param>
      </xsl:call-template>
    </xsl:variable>
    <dc.description.abstract><xsl:value-of select="substring($description.abstract,1,string-length($description.abstract)-1)"/></
dc.description.abstract>

  </xsl:for-each>

  <xsl:for-each select="marc:datafield[@tag=546]">
    <dc.language.iso>
      <xsl:call-template name="subfieldSelect">

```

```

    <xsl:with-param name="codes">a</xsl:with-param>
  </xsl:call-template>
</dc:language.iso>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=588]">
  <xsl:variable name="description">
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">a</xsl:with-param>
    </xsl:call-template>
  </xsl:variable>
  <dc:description><xsl:value-of select="substring($description,1,string-length($description)-1)"/></dc:description>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=590]">
  <dc:type.material>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">a</xsl:with-param>
    </xsl:call-template>
  </dc:type.material>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=591]">
  <dc:type.genre>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">a</xsl:with-param>
    </xsl:call-template>
  </dc:type.genre>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=594]">
  <dc:publisher>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">a</xsl:with-param>
    </xsl:call-template>
  </dc:publisher>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=595]">
  <dc:format.digitalOrigin>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">a</xsl:with-param>
    </xsl:call-template>
  </dc:format.digitalOrigin>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=596]">
  <dc:format.medium>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">a</xsl:with-param>
    </xsl:call-template>
  </dc:format.medium>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=600]">

```

```

<xsl:variable name="subject.lcsh">
  <xsl:call-template name="subfieldSelect">
    <xsl:with-param name="codes">abcdefghijklmnopqrstuvxyz0234</xsl:with-param>
  </xsl:call-template>
</xsl:variable>
<dc:subject.lcsh><xsl:value-of select="substring($subject.lcsh,1,string-length($subject.lcsh)-1)"/></dc:subject.lcsh>
</xsl:for-each>

```

```

<xsl:for-each select="marc:datafield[@tag=610]">
  <xsl:variable name="subject.lcsh">
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdefghijklmnoprstuvxyz0234</xsl:with-param>
    </xsl:call-template>
  </xsl:variable>
  <dc:subject.lcsh><xsl:value-of select="substring($subject.lcsh,1,string-length($subject.lcsh)-1)"/></dc:subject.lcsh>
</xsl:for-each>

```

```

<xsl:for-each select="marc:datafield[@tag=611]">
  <xsl:variable name="subject.lcsh">
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">acdefghjklmnpqrstuvxyz0234</xsl:with-param>
    </xsl:call-template>
  </xsl:variable>
  <dc:subject.lcsh><xsl:value-of select="substring($subject.lcsh,1,string-length($subject.lcsh)-1)"/></dc:subject.lcsh>
</xsl:for-each>

```

```

<xsl:for-each select="marc:datafield[@tag=630]">
  <dc:subject>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdq</xsl:with-param>
    </xsl:call-template>
  </dc:subject>
</xsl:for-each>

```

```

<xsl:for-each select="marc:datafield[@tag=650]">
  <xsl:variable name="subject.lcsh">
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdevxy034</xsl:with-param>
    </xsl:call-template>
  </xsl:variable>
  <dc:subject.lcsh><xsl:value-of select="substring($subject.lcsh,1,string-length($subject.lcsh)-1)"/></dc:subject.lcsh>
</xsl:for-each>

```

```

<xsl:for-each select="marc:datafield[@tag=660]">
  <dc:subject>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdevxy034</xsl:with-param>
    </xsl:call-template>
  </dc:subject>
</xsl:for-each>

```

```

<xsl:for-each select="marc:datafield[@tag=653]">
  <dc:subject>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdq</xsl:with-param>
    </xsl:call-template>
  </dc:subject>
</xsl:for-each>

```

```

</dc:subject>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=662]">
  <dc:coverage>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdefgh</xsl:with-param>
    </xsl:call-template>
  </dc:coverage>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=752]">
  <dc:coverage>
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">adcdffgh</xsl:with-param>
    </xsl:call-template>
  </dc:coverage>
</xsl:for-each>

<xsl:for-each
  select="marc:datafield[@tag=760]|marc:datafield[@tag=762]|marc:datafield[@tag=765]|marc:datafield[@
tag=767]|marc:datafield[@tag=770]|marc:datafield[@tag=772]|marc:datafield[@tag=773]|marc:datafield[@
tag=774]|marc:datafield[@tag=775]|marc:datafield[@tag=776]|marc:datafield[@tag=777]|marc:datafield[@
tag=780]|marc:datafield[@tag=785]|marc:datafield[@tag=786]|marc:datafield[@tag=787]">
  <xsl:variable name="relation">
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">ot</xsl:with-param>
    </xsl:call-template>
  </xsl:variable>
  <dc:relation><xsl:value-of select="substring($relation,1,string-length($relation)-1)"/></dc:relation>
</xsl:for-each>

<xsl:for-each select="marc:datafield[@tag=830]">
  <xsl:variable name="relation.isPartOfSeries">
    <xsl:call-template name="subfieldSelect">
      <xsl:with-param name="codes">abcdevxyz034</xsl:with-param>
    </xsl:call-template>
  </xsl:variable>
  <dc:relation.isPartOfSeries><xsl:value-of select="substring($relation.isPartOfSeries,1,string-length($relation.
isPartOfSeries)-1)"/></dc:relation.isPartOfSeries>
</xsl:for-each>

<dc:language.iso>en_US</dc:language.iso>
<dc:type.material>text</dc:type.material>
<dc:publisher>Texas A&M University</dc:publisher>
<dc:format.digitalOrigin>reformatted digital</dc:format.digitalOrigin>
<dc:format.medium>electronic</dc:format.medium>

</rdf:Description>
</xsl:template>
</xsl:stylesheet>

```

Book Reviews

Norm Medeiros

Catalogue 2.0: The Future of the Library Catalogue. Edited by Sally Chambers. Chicago: Neal-Schuman, 2013. 212 p. \$85 paperback (ISBN: 978-1-55570-943-3).

Despite its title, this book is not about “catalogue 2.0” in the traditional sense. That term usually describes the implementation of Web 2.0 concepts in the library catalogue, such as allowing patrons to share items via Facebook or Twitter, create their own keyword tags to describe resources, and post reviews of books they have read. These features are easy to add to a catalog, but as Anne Christensen points out in the first chapter of *Catalogue 2.0*, they are not a high priority for library patrons who are most interested in finding needed resources. Fortunately, the rest of the book examines the features users do prioritize, such as better search and ranking algorithms, mobile access to the catalogue, and improved access to digital resources. The book also describes back-end features that can provide a more streamlined experience for users, such as the use of FRBR’s framework and linked data.

Catalogue 2.0 begins and ends with a broad look at the purpose of the library catalogue in the modern world. In the first chapter, “Next-Generation Catalogues: What Do Users Think?” Christensen discusses recent studies of what users want in a library catalogue. Lorcan Dempsey ends the book by presenting his view of the modern library catalogue and where it is going in “Thirteen Ways of Looking at Libraries, Discovery, and the Catalogue: Scale, Workflow, Attention.” Each of the six remaining chapters examines a specific development in library catalogues, covering topics as diverse as improvements in searching

and ranking algorithms, implementation and development of discovery tools in Europe, mobile library catalogues, FRBRization of the catalogue, linked data, and digital scholarship.

In the book’s forward, Chambers writes, “The idea behind ‘Catalogue 2.0’ is to provide an overview of the current state of the art of the library catalogue and then to look to the future to see what the library catalogue might become” (xvii). The book meets that standard without exceeding it. While the volume’s contributors are experts in their field, they are writing for a broader audience. As a result, they discuss concepts at a basic level, providing definitions of terms and general explanations of issues involved with a particular development without delving into much detail. Some of the contributors do a particularly good job of explaining difficult concepts; Emmanuelle Bermès, for example, provides an excellent explanation of the Semantic Web and linked data for readers who have never before heard the terms, and Rosemie Callewaert includes a fascinating visualization of FRBR. This approach makes the content accessible to novices, but anyone who has much experience with or knowledge of the content of a chapter is unlikely to pick up new information from it. A few of the chapters offer practical advice and suggestions for libraries that are considering updating their catalogues, but anyone serious about implementing the ideas found here will want to review a more in-depth work on the topic. Even the references provided after each chapter include mostly examples, websites of vendors and organizations, and Wikipedia articles. On the other hand, the variety of topics covered will allow most readers to find some subjects

with which they are not familiar. Furthermore, that variety nearly eliminates redundancy from the volume. Rarely is a topic mentioned more than once, and no topic is explored in detail in multiple chapters. This also allows a reader to select specific chapters that will be useful.

Though the book’s topic is timeless, technologies come with expiration dates. Consequently, *Catalogue 2.0* will likely be irrelevant within a decade, with most of the innovations it examines either commonplace or abandoned. The multitude of examples throughout the book, while wonderful demonstrations of the utility of the ideas presented, will be useful for an even shorter period than the technologies on which they are based. Many of these examples are accompanied by links and screenshots that could be outdated within months or even weeks.

For now, however, *Catalogue 2.0* certainly has its value as a snapshot of where the library catalogue is today and an exploration of where it may be headed. While sections of the book are particularly relevant to technical services and systems librarians, it is certainly worth a read for anyone interested in both a summary of recent developments in and forecast for the library catalog. It could also serve as a reading for a course on library systems, and some of the individual chapters may be appropriate for other library courses as well.—*Julia Hess (jhess@sandiego.edu), University of San Diego*

RDA: Strategies for Implementation. By Magda El-Sherbini. Chicago: ALA, 2013. 394 p. \$65 softcover (ISBN: 978-0-8389-1168-6).

The publication of *RDA: Resource*

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RDA: Strategies for Implementation. By Magda El-Sherbini. Chicago: ALA, 2013. 394 p. \$65 softcover (ISBN: 978-0-8389-1168-6).

The publication of *RDA: Resource*

Description and Access in 2010 and its subsequent implementation has caused a great amount of angst in the cataloging community, giving rise to a need for resources to help libraries implement this new standard.¹ *RDA: Strategies for Implementation* will prove to be a valuable guide to libraries that have not yet implemented RDA while serving as a useful reference for those that have. As a cataloger, manager, and library science educator, author Magda El-Sherbini is well qualified to write this book. She has served on the American Library Association's RDA Advisory Committee and led the Ohio State University Libraries in their participation in the RDA Test Partnership. Ohio State also served as a beta test site for the RDA Toolkit, and her knowledge of that resource is also comprehensive.

RDA: Strategies for Implementation is organized into nine chapters. It begins with a short chapter that describes the need for a new cataloging code, RDA's underlying principles and objectives, and RDA's impact on cataloging. Chapter 2 addresses the differences between RDA and the Anglo-American Cataloguing Rules, 2nd ed. (AACR2).² This is highly useful, and the differences are presented in chart form so that the AACR2 and RDA practices are side-by-side and can be easily compared. El-Sherbini breaks these differences into categories such as scope, description, use of square brackets, recording inaccuracies, abbreviations, capitalization, and many descriptive elements of the cataloging record.

In the third chapter, El-Sherbini provides good advice for implementing RDA. She shares tips for catalogers and cataloging managers on becoming familiar with the resources needed to work with RDA, including the RDA Toolkit. She refers catalogers to the many webinars that are freely available on the Internet, and provides advice for conducting in-house training. Part of the intention of RDA was to allow

online catalog interfaces to display records in a more meaningful way. This third chapter includes a section that demonstrates how RDA can affect interface displays in a positive way. RDA has required the establishment of new MARC fields, and those are described in this chapter along with suggestions for implementation.

With chapter 4, El-Sherbini changes gear somewhat to present the theoretical underpinnings of RDA. The Functional Requirements for Bibliographic Records (FRBR) conceptual model was presented at an International Federation of Library Associations (IFLA) conference in 1997 and has been used as the basis for development of RDA. El-Sherbini does an excellent job of explaining the FRBR model of entities, attributes, and relationships, and demonstrating its application through illustrations in this chapter.

Chapters 5 and 6 contain the meat of the cataloging instruction. Chapter 5 addresses manifestations and items, and chapter 6 addresses works and expressions. Each chapter provides a robust set of instructions, referencing the RDA rule and MARC tag as appropriate. Chapter 6 includes a thorough discussion on relationships, a key concept in RDA.

The RDA Toolkit is an online resource that many, if not most, catalogers will use to access RDA and many accompanying resources. In chapter 7, El-Sherbini provides instructions for using the Toolkit, including logging in, using its FAQ and help features, browsing the Toolkit using its tabs, and the quick and advanced search options. Many screenshots illustrate each section discussed. This chapter should prove immensely useful to catalogers, managers, and trainers.

El-Sherbini devotes chapter 8 to dozens of examples of RDA records. These examples illustrate types of resources that catalogers would likely face, including print monographs, serials, visual materials, maps, globes,

sound recordings, scores, integrating resources, computer files, and more. Each sample record has an accompanying notes section in which El-Sherbini points out significant issues. For instance, with the print monograph example, she notes the differences in transcription practice, abbreviation, source of cataloging information, and the new MARC fields for content, media, and carrier type. These notes are very useful and will be an excellent resource for trainers.

Chapter 9 includes a brief selection of checklists that catalogers, managers, and trainers will find very helpful. It includes checklists for copy and original catalogers, and one for authority control.

RDA: Strategies for Implementation is well organized, with many illustrations, tables, and screenshots that demonstrate the rules, the theory behind the rules, and the Toolkit developed to support use of RDA. Each chapter includes a list of references and additional resources that readers can use to investigate topics further. The book also includes a bibliography and index.

RDA: Strategies for Implementation will be an excellent resource for catalogers who are in the midst of implementing RDA. It will also be useful for managers and trainers, who can use the many tips for implementation and the checklists. Libraries that have already implemented RDA would also find this book useful to have in their cataloging reference collections. There are a few flaws in the book, including typos and other errors. Since the book was completed in January 2012, subsequent changes to RDA and policy decisions that occurred since then are not represented. One example is the Program for Cooperative Cataloging's (PCC) decision about the use of MARC field 264 for publication data, which this book does not address. This book would be an excellent addition to personal or professional collections in any library.—Rebecca L. Mugridge

(*rmugridge@albany.edu*), *University at Albany, State University of New York*

References

1. *RDA: Resource Description & Access* (Chicago: ALA; Ottawa: Canadian Library Association; London: Chartered Institute of Library and Information Professionals, 2010).
2. *Anglo-American Cataloguing Rules*, 2nd ed., 2002 rev., 2005 update (Chicago: American Library Association; Ottawa: Canadian Library Association; London: Chartered Institute of Library and Information Professionals, 2002).

Cataloging Collaborations and Partnerships. Edited by Rebecca L. Mugridge. New York: Routledge, 2014. 317 p. \$145 hardcover (ISBN: 978-0-415-71235-4).

Libraries have a long history of collaboration with other libraries, especially with regards to cataloging. This book contains many articles originally published in *Cataloging & Classification Quarterly (CCQ)* volume 51, issue 1–3, which discuss collaborative efforts of cataloging units within libraries. The articles are broken down into the following broad categories:

- “Collaborations in Cooperative Cataloging and Authority Initiatives”
- “Collaborative Cataloging Initiatives”
- “Collaborations in Merging and Migrating Online Catalogs”
- “Collaborative Development of Training and Documentation”
- “Collaborative Approaches to Special Projects”

As acknowledged by the editor of this work, there is not a lot of published information on collaboration within cataloging units. To help increase the amount of library literature on this topic, the editor of this book placed

a call for articles that were brought together into a triple issue of *CCQ*. This book brings to light a representative sampling of the different types of collaborative cataloging efforts that are currently underway in libraries. While there are many collaborative projects mentioned in this book, the following is a summary of a few of these ideas.

The first section of the book discusses different projects that have been completed to enhance authority initiatives. This includes information on how the Library of Congress worked with different libraries to develop the Library of Congress Genre/Form Terms (LCGFT) as well as the Electronic Cataloging in Publication (ECIP) Cataloging Partnership Program.

The second section gives some examples of cataloging initiatives with regards to bibliographic records. One of the projects includes the idea of “insourcing” the cataloging of music items within multiple libraries of the University of California system. Another cooperative cataloging project discussed is with the University of Montana working closely with the US Government Printing Office to catalog pre-1976 US Forest Service publications.

In a section on merging and migrating online catalogs, two different articles discuss the benefits and problems with combining multiple library catalogs into one system. These two use cases, completed in Florida and the West Indies, have similarities in that a major goal of each was to reduce the number of resources that each institution was committing to maintaining the same types of databases and systems. Combining their catalogs made it possible to have a centralized unit responsible for the management of their integrated library systems (ILS). Another interesting collaboration demonstrated in this section includes the migration to an open-source ILS at a library in the Galapagos Islands, which is mainly

staffed by volunteers.

There are four articles related to collaboration for training and development within cataloging units. One of the articles, discussing efforts to build a skills inventory and a set of best practices within OHIOLink, includes a useful section on ideas for implementing such a project. Subsections within this include helpful tools for planning, project implementation, methods of compensation, creating a memorandum of understanding, and evaluating the project. Another major training collaborative that is discussed involves catalogers from Uganda and Norway assisting a library in Sudan with the implementation of an open-source ILS.

The final section of this book includes several “special projects” and how they were accomplished through collaboration. This includes a chapter about research datasets being integrated into existing digital repositories at the University of North Texas, updating web searching for the University of New Mexico by collaborating with their information technology department, the use of electronic discussion lists to maintain bibliographic and authority files, and how a library’s ILS can be used as a source for providing outreach to an academic institution.

An important aspect of this book is that it provides many examples of how library cataloging operations have changed in recent years. Catalogers have to reach out to the broader library community to achieve their goals and to continually improve the services that they provide. This book presents many collaborative situations that can be applied to cataloging units in different types of libraries by showing how working with other groups can help with budgetary constraints, by completing large projects where catalogers may not have the correct expertise, and through demonstrating ways that catalogers can apply their current knowledge and skills to situations outside of traditional library cataloging.

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References

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As stated by the editor, collaborative efforts within libraries can “bring more ideas to the table, enhance creativity, and increase librarians’ ability to solve problems” (1).

While there are many more collaborative efforts continually being explored in library cataloging, this book brings together a good number of examples that shows the importance of this topic. This title would be a good resource for catalogers to help them get more ideas on collaborative opportunities. It would also be useful to library administrators and managers as a demonstration of the necessity of cataloging work, as well as in helping such leaders promote collaborative efforts within their libraries.—*Jeremy Myntti* (*jeremy.myntti@utah.edu*), *University of Utah, Salt Lake City, Utah*

Practical Digital Preservation: A How-To Guide for Organizations of Any Size. By Adrian Brown. Chicago: Neal-Schuman, 2013. 336 p. \$75 softcover (ISBN: 978-1-55570-942-6).

Practical Digital Preservation: A How-To Guide for Organizations of Any Size provides detailed information about and helpful strategies for tackling the robust and evolving world of digital preservation. The author defines digital preservation as “the process of maintaining a *digital object* for as long as required, in a form which is *authentic*, and accessible to users” (xii). The book is divided into ten chapters and includes a glossary of terms, appendixes, bibliography, and index.

The first chapter includes some practical information regarding appropriate audience, use of the book, minimum requirements for embarking on digital preservation, myths about digital preservation, a comprehensive survey covering the history of digital preservation, and some helpful hints about terminology.

In chapter 2, the author outlines strategies for building a digital

preservation program and for handling challenges such as limited staffing, resources, technical infrastructure, and knowledge of project management. He argues that the first step should be securing recognition from administrators that digital preservation is important to the success of the organization. The author helps the reader in this regard by focusing this chapter on creating an effective business plan for digital preservation. Moreover, the author includes methods for discussing the financial and nonfinancial benefits of adopting and embracing a digital preservation plan. Creating a digital preservation policy and knowing the essential components therewith can be a powerful means of securing support from administrators and colleagues.

Chapter 3 provides a needs assessment for creating a well-documented, sustainable, and successful digital preservation program. The chapter focuses on the best way to develop a set of requirements, communicate with stakeholders to secure support and contribution to the program, examine other business plans and policies, and build on what the organization is already doing. Additionally, the author includes detailed information on how established requirements should be articulated and documented. The last part of the chapter highlights the application of established requirements and the best way to create an actual digital preservation program.

The fourth chapter includes many useful case studies that outline approaches to creating and implementing a digital preservation program. A range of possible options are discussed in this chapter, from in-house solutions to outsourcing; in addition the author describes why certain models are better suited to particular organizations. If an organization has already chosen an approach, this chapter would be useful to consult as it assesses the implementation process as well as the practicalities of managing a digital preservation service. Finally,

the author provides information on the best way to develop a realistic roadmap to bring a digital preservation program to its optimum level of service and capacity in the future.

Chapters 5 and 6 focus on the two stages of acquiring digital content for repositories. The author describes stage one in chapter 5: “The institution makes a decision to acquire a specific collection of material, undertakes any preparatory activities, and performs the physical transfer of that material into its custody” (109). This chapter also discusses important issues that need to be addressed in advance of content transfer, as well as developing a selection policy and process for acquisition. Chapter 6 discusses stage two, accession and ingest of digital content. The author notes that in this stage “the various activities required to ensure that the transfer has been successful” occur, as well as those activities that “generate all information necessary for the preservation and future management of the content, and ingest it into the digital repository” (109).

A digital repository (or any digital record) is useless unless there are descriptive metadata attached to it. In chapter 7, the author defines metadata as “the set of information required to enable content to be discovered, managed and used by both human agents and automated systems” (155). He summarizes the importance of metadata, standards that address the descriptive information needed, how to create appropriate metadata, and how they can be managed and stored. The role metadata play in a digital repository is discussed in depth, and the author provides a set of useful case studies toward the end of the chapter. Chapter 8 examines in depth the preservation of digital content, and stresses the importance of being able to access and use digital content over the long term. The author does not deny that the preservation of digital objects is a complex issue, but he gives practical

As stated by the editor, collaborative efforts within libraries can “bring more ideas to the table, enhance creativity, and increase librarians’ ability to solve problems” (1).

While there are many more collaborative efforts continually being explored in library cataloging, this book brings together a good number of examples that shows the importance of this topic. This title would be a good resource for catalogers to help them get more ideas on collaborative opportunities. It would also be useful to library administrators and managers as a demonstration of the necessity of cataloging work, as well as in helping such leaders promote collaborative efforts within their libraries.—*Jeremy Myntti* (jeremy.myntti@utah.edu), *University of Utah, Salt Lake City, Utah*

Practical Digital Preservation: A How-To Guide for Organizations of Any Size. By Adrian Brown. Chicago: Neal-Schuman, 2013. 336 p. \$75 softcover (ISBN: 978-1-55570-942-6).

Practical Digital Preservation: A How-To Guide for Organizations of Any Size provides detailed information about and helpful strategies for tackling the robust and evolving world of digital preservation. The author defines digital preservation as “the process of maintaining a *digital object* for as long as required, in a form which is *authentic*, and accessible to users” (xii). The book is divided into ten chapters and includes a glossary of terms, appendixes, bibliography, and index.

The first chapter includes some practical information regarding appropriate audience, use of the book, minimum requirements for embarking on digital preservation, myths about digital preservation, a comprehensive survey covering the history of digital preservation, and some helpful hints about terminology.

In chapter 2, the author outlines strategies for building a digital

preservation program and for handling challenges such as limited staffing, resources, technical infrastructure, and knowledge of project management. He argues that the first step should be securing recognition from administrators that digital preservation is important to the success of the organization. The author helps the reader in this regard by focusing this chapter on creating an effective business plan for digital preservation. Moreover, the author includes methods for discussing the financial and nonfinancial benefits of adopting and embracing a digital preservation plan. Creating a digital preservation policy and knowing the essential components therewith can be a powerful means of securing support from administrators and colleagues.

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approaches to preservation techniques along with their applications.

Chapter 9 takes a close look at providing reliable access to users. The author summarizes this point by stating, “Everything we do in this regard must therefore be informed by the needs of current and future users; their requirements should dictate how we go about the business of digital preservation” (243). This chapter concentrates on what organizations need to consider when providing access to their digital content, the technical challenges associated with providing access, and the curatorial and legal responsibilities for delivering digital content to users. The last chapter of the book comments on the rapidly changing environment of digital preservation and analyzes emerging technologies and future trends. The author does a nice job of forecasting the future of digital preservation without coming across as a fortuneteller.

While the content is geared toward libraries, museums, and archives that are producing and maintaining digital content, this book would also be beneficial for professionals outside these fields. Each chapter is organized in a meaningful way, and the entire book flows with a natural progression through the complex stages of digital preservation. There is not a lot of technical jargon and the concepts outlined can be applied to small or large organizations that have a variety of assets. The author does an excellent job presenting complicated content in a digestible way, and offers useful case studies throughout the book. *Practical Digital Preservation* is an excellent book for anyone working with and producing digital content.—Katie Nash (knash@elon.edu), *Elon University, Elon, North Carolina*

Getting Started with Evaluation.

By Peter Hernon, Robert E. Dugan, and Joseph R. Matthews. Chicago: ALA Editions, 2014. 242 p. \$65 soft-cover (ISBN: 978-0-8389-1195-2).

Articles, books, blogs, and webinars about assessment of technical and public services in both academic and public libraries abound. *Getting Started with Evaluation* is the latest American Library Association contribution to this mix. The authors of this title have published often in the subject; each has extensive experience in the field of library management, especially in the area of evaluation. All three have taught in library schools at some point in their careers. They acknowledge, however, that most practicing librarians did not take a course in research methods during their studies. This book is intended to provide an introduction to evaluation to those librarians as well as to current students in information management and research methods courses.

The book is logically structured to serve this need. Chapter 1 begins with an overview of the topic of evaluation, complete with definitions and lists, providing vocabulary to enable subsequent examination of the topic. As the authors note early in the text, “Evaluation is the process of identifying and collecting data about specific services or activities, establishing criteria by which their success can be measured, and determining the quality of the service or activity—the degree to which it accomplishes stated goals and objectives” (2). The authors establish this relationship between management and evaluation immediately and continue to reference it throughout the book, using further chapters to explore the evaluation process, library metrics, the audiences for evaluation (both internal and external), specifics about measuring, and how best to communicate results. As each of these topics is explored, the emphasis remains on the integration of evaluation into everyday library management.

The explanation of the process for evaluation includes practical suggestions for how to accomplish each step (e.g. the SPICE model for determining a question to study appears on

p. 19). The authors provide a range of actions and suggestions for how to assess a variety of library metrics (surveys, return on investment studies, cost-benefit analyses, etc.), from simple to complex. They include a variety of topics that are on my radar, like ethnographic research and measuring library contributions toward the completion agenda, a pressing issue at community colleges. Readers are urged to adapt these metrics to their own environments. There are many examples of ways to evaluate; both internal sources of data (collected at library and institutional levels) and external sources of data (sets of data available elsewhere for comparison) are described in detail. The authors generally discourage self-reported data in favor of measuring actual behaviors of library users while acknowledging that qualitative measures are required for a complete picture of the user experience. The goal of changing lives through exposure to libraries and library services is repeatedly emphasized throughout these sections of the book.

Boxes, tables, and figures provide concrete examples of the concepts described within each chapter. As the concepts and techniques covered increase in complexity, the authors provide formulas and steps to help reduce anxiety and encourage readers to begin evaluating.

Following the details of how to collect data, readers are counseled on how to use and communicate their findings.

Exercises are provided at the end of each chapter. These range from open-ended questions to stimulate discussion, to mathematical challenges, to questions requiring a one-word answer. Official answers to the exercises are provided in an appendix. These exercises would be useful for library and information science faculty and students, of course, but the authors also note their intent that these exercises also be used by library staff. The

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Articles, books, blogs, and webinars about assessment of technical and public services in both academic and public libraries abound. *Getting Started with Evaluation* is the latest American Library Association contribution to this mix. The authors of this title have published often in the subject; each has extensive experience in the field of library management, especially in the area of evaluation. All three have taught in library schools at some point in their careers. They acknowledge, however, that most practicing librarians did not take a course in research methods during their studies. This book is intended to provide an introduction to evaluation to those librarians as well as to current students in information management and research methods courses.

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authors repeatedly state, “We encourage different members of a library staff to work on the exercises together and to discuss the results” (15).

In addition to notes provided at the conclusion of each chapter, there is a list of selected readings (229–32). One text box consists of key writings (106). All three items listed in this box were written by Hemon with another author; two of the three items include another author of this book. There are many self-references included throughout the book, perhaps because it is a collaboration of three authors to provide a synthesis of their independent work. Many years of experience and study are reflected in these lists; both classic titles and newer research are represented.

At the conclusion of the text, readers are reminded of the continuous nature of library evaluation—it is never finished, so we are urged to keep track of results over time for comparison. The authors encourage readers to assess the information they already have and begin formal evaluation of their libraries. The two-part desired outcome is repeated again: an effectively managed library and an effective communication mechanism for all stakeholders in the library. Note that the library staff are the first stakeholders to be won over; then the book provides guidance as to whom to tell, what to say, how to say it (e.g., always include an executive summary of two pages or less), why to say it, and when to say it.

The authors accomplish what they set out to achieve as stated in the preface—they identified “what might library managers do that they are not currently doing” and explained “how do they do those things” (x). Evaluating this book according to the principles contained therein, how well are readers prepared to conduct evaluation in their own libraries by the end of the volume? I, for one, have been prompted to examine my current responsibilities to find ways to incorporate

evaluation into my daily work. Hemon, Dugan, and Matthews inspire readers to collect data to inform decision making whenever possible, and *Getting Started with Evaluation* provides the means to get started right away.—*Anne M. Sleeman (asleeman@ccbcmd.edu), Community College of Baltimore County, Catonsville, Maryland*

Digital Libraries and Information Access. Edited by G. G. Chowdhury and Schubert Foo. Chicago: Neal-Schuman, 2012. 235 p. \$99.95 (ISBN: 978-1-55570-914-3).

Since their emergence more than two decades ago, digital libraries have been developed in response to emerging and evolving researcher access needs. Digital libraries themselves have been the subject of ongoing research primarily undertaken by computer scientists, information scientists, and librarians, in addition to researchers from other fields. The definition and model of a digital library have likewise been approached from many different perspectives throughout a growing body of literature specific to their study. Early definitions focused on considering a digital library as an organization that provides access to digital works and has some obligation to preserve these works. Today, digital libraries have in many instances grown in scope and purpose with various projects seeking to better understand user interactions, facilitate collaborative information seeking activities, and refine how metadata are ingested, integrated, and provided. Current digital library projects might address emerging legal, ethical, and policy issues pertaining to information access, incorporate new resource types such as research outputs and data, and take advantage of developments in information storage to optimize management and functionality.

Literature about digital libraries has grown significantly since they became a research focus, with more than 8,000 conference papers and

journal articles published to date, along with many books and other resources. Chowdhury and Foo have contributed a new reference monograph on the subject, international in scope, which includes citations of exceptional breadth and depth that draw from the now substantial extant body of literature published about digital libraries. In *Digital Libraries and Information Access*, the editors provide a compilation of investigations into topics that range from the foundations of digital library development (architecture and design, understanding user interaction), to current advocacy issues (understanding digital library needs in developing nations, fostering social inclusivity, supporting open access), to detailed case studies (aligning different approaches to subject metadata, assessing information access features across select digital library sites). Given its inclusive scope and the potential that each chapter offers for continued research exploration, this title could easily be used as a textbook for students of information science while still offering current digital library practitioners a useful overview of the state of digital library research today.

Several chapters address the importance of better understanding user interactions in digital libraries, an area of growing research. In chapter 8, Wilson and Macevičiūtė note that the topics of usability and user studies have indeed expanded to compose more than a third of the literature on digital libraries. They note that researchers are increasingly focused on understanding both general and specific user activities along with design aspects related to their behavior and comparing different research methods to assess this behavior. They encourage further exploration of user interactions in digital libraries, especially as they assert that “the digital library seems likely to be the dominant form of organized information” (124). They suggest means for modeling user behavior in

authors repeatedly state, “We encourage different members of a library staff to work on the exercises together and to discuss the results” (15).

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digital libraries beyond general models of information behavior, noting that the actions users take within a given digital library can be constrained by the interface and functionality with which they are presented.

Chowdhury and Foo, in chapter 4, discuss the role that interface design has on user interactions and acknowledge that visualization techniques in particular hold great and unrealized potential for enhancing user interactions, especially as digital libraries expand to include more and different types of content. In chapter 9, Kim, Durr, and Hawamdeh focus their attention on a specific context of use—scholarly information—and in so doing, consider trends and opportunities that have emerged for engaging with digital content resulting from electronic publishing. They note how significant the roles of both technology expansion and digital information are in shaping users' interactions with research resources, and discuss how mobile technologies and discovery tools outside the library (such as Google Scholar) play a role in today's scholarly information landscape. Like Chowdhury and Foo, these authors also see the potential in providing users with visually oriented tools to better understand digital resources, in this case those that support visual data analysis and learning.

Metadata are integral to digital libraries in managing content and supporting access to that content. The former is discussed in chapter 2 and the latter is given more sustained attention in this book, discussed throughout several chapters. The analysis that Shiri and Rathi provide in chapter 3 concerning how metadata are leveraged to facilitate user interactions shows how a combination of manually, automatically, and user-generated metadata can help users refine their search paths and make informed decisions about resource selection. They illustrate this with four digital library websites (two national and two public). Chapter 11

provides a detailed description of Yang and Park's iSTEM project to integrate subject categories from multiple repositories. This integration work was undertaken to provide users with a single set of topical terms used in navigating and selecting digital resources relevant to their research. This chapter should be of great interest to anyone working to support subject-based access to content in a digital environment using metadata from disparate sources, and while quite technically detailed, provides an opportunity for readers to consider tangible applications of a research project. Another metadata issue considered in chapter 3 is the role of crowdsourced metadata, including user ratings, comments, and tagging, each of which support users' search processes from navigation to resource selection.

In addition to its emphases on understanding user interactions and the role of metadata in digital libraries, *Digital Libraries and Information Access* is notable due to its extended considerations of the social role of digital libraries, which range from an overview of the impact of Web 2.0 applications and tools (chapter 6), to an exploration of how digital libraries can facilitate collaborative information seeking (chapter 5), to addressing practitioners' obligations to ensure equitable approaches to access from technology as well as content selection and presentation perspectives (chapter 7).

Chowdhury and Foo have shaped a compilation of thoughtful approaches to current issues in digital libraries as they relate to information access. The authors throughout provide numerous opportunities to extend the reader's exploration of these topics by virtue of well-chosen case studies, timely examples, and identified trends, as well as the comprehensive bibliographies included with each chapter. Readers seeking to better understand the fundamentals of how users engage with digital libraries as well as gain

a contextual grasp on both the historic and contemporary attendant research will be able to satisfy both of these goals.—Kathryn Stine (*Kathryn.Stine@ucop.edu*), *University of California, Oakland, California*

Developing and Managing Electronic Collections: The Essentials.

By Peggy Johnson. Chicago: ALA Editions, 2013. 186 p. \$65 softcover (ISBN: 978-0-8389-1190-7).

As Johnson comments in the preface, her goal is to offer practical advice in working through the many issues involved in providing library users access to online resources. She focuses on indexing and abstracting services, e-books, e-journals, and streaming multimedia; she does not address locally produced content, digital textbooks, games, or software.

The book opens with a brief history of electronic resources in libraries. Although some readers may be tempted to skip the history, it both explains the context for many of the issues librarians face and introduces some essential vocabulary. For example, Johnson introduces terms like Open URL, link resolver, and digital rights management (DRM) as developments that helped libraries manage and provide access to electronic collections. In chapter 1, she also introduces issues such as equitable access, collection stability, and the differences in how publishers offer popular and scholarly content to libraries.

Throughout the book, Johnson focuses on factors to consider when selecting, acquiring, and managing e-resources. For example, in the second chapter, she lists a dozen selection criteria, in addition to the standard criteria for all materials, which libraries should consider when selecting electronic resources. She explains the importance of criteria such as persistent content, discussing the implications of leasing content from an aggregator versus a publisher and of purchasing content with annual

digital libraries beyond general models of information behavior, noting that the actions users take within a given digital library can be constrained by the interface and functionality with which they are presented.

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Throughout the book, Johnson focuses on factors to consider when selecting, acquiring, and managing e-resources. For example, in the second chapter, she lists a dozen selection criteria, in addition to the standard criteria for all materials, which libraries should consider when selecting electronic resources. She explains the importance of criteria such as persistent content, discussing the implications of leasing content from an aggregator versus a publisher and of purchasing content with annual

hosting fees. She also gives practical examples, such as Penguin's decision to pull e-books from the aggregator OverDrive, of why these criteria are important for all types of libraries to consider.

The chapter on licenses should be required reading for every library employee, not just those directly responsible for negotiating licenses. Johnson emphasizes that license terms override copyright law, then gives examples of how license terms can affect ILL, course reserves, patron use of the content, and patron privacy. She also explains key elements of licenses and introduces common language, such as authorized use and perpetual access, with brief examples to illustrate their importance. Throughout the licensing chapter, Johnson emphasizes that state law sometimes requires or prohibits certain terms. Finally, she tells readers that legal training is not essential for negotiating licenses; the author recommends sites for finding model licenses and discusses best practices in developing guidelines for license negotiation.

Two chapters, on conducting business with suppliers and on working across organizational units, stress the importance of good communication. These chapters outline many issues peculiar to e-resources, such as issues to consider before agreeing to become a beta site for new products or major

upgrades. While the chapter on working across organizational lines may seem to target larger libraries, Johnson points out that the tasks discussed are essential whether a library has a single person or several units involved in e-resource management. These chapters also discuss tools for managing e-resources, ranging from shared spreadsheets to commercially available electronic resource management systems. Instead of recommending specific tools, Johnson explains advantages and disadvantages that libraries should consider when selecting tools to manage e-resources.

In the chapter on budgets and financial considerations, Johnson discusses different ways that libraries allocate funds for e-resources. Once again, she focuses on explaining issues to consider, such as how separate subject funds may help balance collections, but may also hinder purchases of multidisciplinary e-resources. This chapter also briefly introduces some of the issues to consider when contemplating patron-driven acquisitions or pay-per-view, introduces methods of forecasting budget needs, and explores some reasons consortia can be useful in acquiring e-resources. This chapter, along with the final chapter on the future of e-content in libraries, should prompt librarians to seriously consider whether they need to redesign materials budgets to better deal with the

many options for acquiring electronic resources.

The strength of this book is its focus on issues that libraries should consider rather than prescribing specific solutions to complex issues. Two other strengths are the many short lists and the suggested readings at the end of most chapters. Many sections begin with a short list of issues that librarians should consider, then goes on to discuss each issue. These lists could easily be adapted into procedural checklists, with librarians adding details about how each issue will be handled in their library. Each chapter except the last has about a dozen suggested readings to help readers who need more information about a particular issue.

Johnson's book is an excellent contribution to the literature on e-resource acquisitions and management; it fully lives up to the author's goal of providing practical advice on working through issues related to e-resource collections. Further, by focusing on issues libraries should consider and providing many brief examples of how different options affect workflows and usability, Johnson has written a book relevant to all sizes and types of libraries. Recommended for all libraries and for students seeking an introduction to the issues.—*Ginger Williams (ginger.williams@wichita.edu), Wichita State University, Wichita, Kansas*