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Cover image: Carousel horse, Seaside Heights, NJ, by Isaiah Beard, 2017.

Editorial

This issue of *LRTS* is meaningful to me in numerous ways. First, it contains five research papers. It has been unusual during my tenure as *LRTS* Editor to publish this many research papers in an issue. I typically have two to three and often an equal number of "Notes on Operations" papers.

Additionally, many of the research papers in this issue were submitted to the editorial system previously used for *LRTS* (the submission management system was switched in May 2018). The transition between systems was not particularly smooth. I am grateful to the authors who were affected by this change for their patience and understanding. The variety of subjects reflected in these papers, ranging from book conservation to article-level discovery to acquisitions and RDA adoption and implementation in public libraries, is impressive. Technical services work is complex and varied and provides the foundation for effective library operations overall. It is often overlooked as it proceeds seamlessly when effective processes are in place. However, the path to those processes typically involves trial and error, and sometimes failure, which is a critical part of problem solving.

As libraries acquire and make available an increasing number of electronic resources (e-resources), there is a growing need to preserve older and fragile materials, many of which are not available electronically or are too fragile to possibly digitize. I participated in a planning discussion with colleagues and was surprised that e-resources were described as providing instant access. The planning, negotiation, and constant monitoring of e-resources is time consuming and constant. Accessing e-books is not always straightforward as there might be proxy issues and usage restrictions. Acquiring them is a challenge with different vendor platforms, digital rights, and purchasing models.

Introducing new resource description standards, particularly RDA, is expensive, time consuming, and challenging. Part of the struggle involves acceptance and buy in, and a commitment. There are instances when implementation of a new standard or changes are not executed because an institution lacks funding or staffing, or there is a belief that the existing standards and procedures are acceptable. This can be a conscious choice as there are institutions where catalogers apply both AACR2 and RDA, others that have chosen to implement RDA but include AACR2 practices in their procedures and workflows, and still others who might not be supported by their administration.

The acquisition of e-books and RDA implementation are two of the topics in this issue:

- In "A Comparison of Standard Practice Treatments in Research Library Book Conservation, 2007 to 2017," Whitney S. Baker reports on the findings of a ten-year follow-up survey conducted in 2017 to determine whether and how book conservation practices have changed over the last ten years.
- Aruna P. Magier addresses the role of foreign language journals as important components of interdisciplinary area studies collections at research libraries in her paper "Creating Article-Level Discovery of Print-Only Foreign Language Journals: A Case Study of SALToC's Distributed Approach." Her paper discusses SALToC, the South Asian Language

Journals Cooperative Table of Contents project, which creates online, centrally browsable open access tables of contents to enable shared access to print-only foreign language journals that are not typically included in online abstracting and indexing services.

- How and to what extent RDA has been implemented in US public libraries is the topic of "Resource Description and Access Adoption and Implementation in Public Libraries in the United States," by Roman S. Panchyshyn, Frank P. Lambert, and Sevim McCutcheon. The authors used survey methodology to focus on collecting data on variables that include geographic location, educational level, training history and needs, library size, and budget.
- Maria Savova and Jason S. Price define four key facets of a materials budget that has been optimized for the e-resources environment and describe a process that can be used to redesign any academic library budget structure for electronic purchases. Their paper "Redesigning the Academic Library Materials Budget for the Digital Age: Applying the Power of Faceted Classification to Acquisitions Fund Management" includes specific examples of important practical advantages that have accrued at their institution since a full-faceted materials budget was implemented.
- "E-book Use over Time and across Vendors in an Interdisciplinary Field," by Daniel Tracy, presents an analysis of e-book usage in an interdisciplinary research collection for library and information science (LIS). This study demonstrates the usage of LIS e-books as an exemplary interdisciplinary collection, and how to develop options for analyses of e-book collections that maximize the utility of usage reports.
- Ronald M. Lewis and Marie R. Kennedy's paper "The Big Picture: A Holistic View of E-book Acquisitions," describes how the merging of two departments at their library provided an opportunity to rethink workflows and identified e-book acquisitions as a critical task to review. Process mapping was used to show the complexity of different work being performed in their department and offered staff a visual mechanism to see how their work fit into a sequence of actions as part of a larger workflow.
- Book reviews by Book Review Editor Elyssa Gould for your professional reading and enrichment.

A Comparison of Standard Practice Treatments in Research Library Book Conservation, 2007 to 2017

Whitney S. Baker

In 2007, a web-based survey of book conservation practices was conducted to document standard-practice, moderate-use, and low-use book conservation treatments for general and special collections in research libraries in the United States. This paper reports on the findings of a ten-year follow-up survey conducted in 2017 to determine whether and how book conservation treatment practices have changed over the last ten years. Overall, the data indicate that while general collections treatment practices have remained consistent, special collections practices continue to evolve, with many treatments newly qualifying as standard practice in the special collections context since 2007. The data also suggest areas of further research, including how demographic factors may correlate with particular treatment practices.

In 2007, a survey was conducted among conservation practitioners, resulting in a published assessment of book conservation practices in research libraries in the United States.[1] This research identified a "standard toolbox" of treatments for both general and special collections as practiced in the first decade of the twenty-first century, establishing a baseline for subsequent comparisons. It provided a quantitative synopsis of how book conservation was actually practiced in research libraries as compared to what was documented in the literature. A second publication correlated institutional context and training of conservation professionals with specific treatment practices.[2] The second study concluded that practitioners working in hybrid facilities—in which both general and special collections were treated— tended to use a hybrid treatment approach, straddling more traditionally general versus special collections treatment practices.

This study reports on the findings of a ten-year follow-up survey to determine how treatment practices have developed in the ensuing decade. For continuity, the new survey was almost identical to the 2007 version, with minimal changes necessitated by a review of the literature to identify techniques that may have become commonplace since the initial survey. In the future, the survey data will be assessed to determine how demographic characteristics correlate with changes in treatment practices in the last decade.

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The author would like to thank and recognize Liz Dube for fruitful collaboration on the analysis, research, and publication of the 2007 data, and her assistance in preparing and disseminating the 2017 survey that resulted in this analysis.

Literature Review

Several factors may have significantly influenced the resources and focus of conservation laboratories since the first survey in 2007. First, as research libraries increasingly acquire similar general collections resources as large digital collection subscriptions, special collections have become an ever more vital means for libraries to distinguish themselves and to support local teaching and research with unique specialized content. As Pritchard noted in 2009, "special collections have become even more important as a differentiating characteristic of research universities, the equivalent of unique laboratory facilities that attract faculty and research projects."[3] Many research institutions have broadened their definition of "special collections" beyond rare books and manuscripts to include archival collections, international or area studies, and other topical or specialized collections that distinguish one library from another, often under the rubric of "distinctive collections." For example, the University of Texas at Austin defines their distinctive collections as "consisting of unique, rare and contextually significant collections of materials and providing abundant opportunities for scholarship. . . . These collections have particular value and meaning in that they represent specialized areas of research, are historically significant, have specific contextual value, or are rare or unique in terms of content and/or format."[4] Similarly, Northwestern University's Distinctive Collections unit was created to comprise "all rare and unique materials, along with select subject collections of extraordinary depth" including focus in African Studies, art, special collections, music, transportation, and the University Archives.[5]

Over the last decade, many conservation units have added staff trained in treatment of special collections materials where staff additions to care for general collections have been relatively rare. According to the latest published American Library Association (ALA) Preservation Statistics Survey, preservation and conservation "expenditures on professional staffing [most typically associated with special collections treatment] rose 14 percent" over a period from 2008 to 2012.[6] Miller and Horan, in a review of position announcements for preservation professionals from 2004 to 2015, noted that "special collections conservation [is] more likely to remain present in job advertisements," versus a "de-emphasis on many aspects of treatment and care of circulating collections."[7]

In many research libraries, the quantity of general collections book repair has declined in the last decade, as have many libraries' commercial binding budgets.[8] In a comparison of the 2008 and 2012 Association of Research Libraries (ARL) survey results, Peterson et al. found that a decrease in the number of treated bound volumes and pamphlets was driven by a "reduction in the rate of level 1 treatments (those that require fewer than fifteen minutes of staff time per item), which appeared to decline by 86 percent from 2008 to 2013."[9] Additionally, they correlated the reduction in level 1 treatments with a reduction in nonprofessional staffing most likely to perform level 1 treatments.[10] These data indicate that the quantity of minor treatments more typical to general collections, along with the staff who perform them, appear to be declining. Miller and Horan found a similar reduction in positions advertising for circulating book repair treatment (41 to 11 percent), indicating that there have been fewer advertised positions focusing on the treatments that are more likely to be performed by technicians than professionals with graduate degrees.[11]

The growth of digitization initiatives in research libraries has placed new demands on conservation over the past decade, significantly affecting the treatment approaches employed by conservation professionals and impacting staffing needs. Gracy and Kahn stated in 2012 that "digitization is no longer an emerging tool; it is the established and often preferred method for reformatting."[12] In response to the changing context, conservation professionals have adapted their treatment practices. Treatments required to support digitization are typically not extensive but tend to consist of minimal stabilization prior to scanning. As noted by panelists in the 2008 Library Collections Conservation Discussion Group (LCCDG) at the American Institute for Conservation (AIC) annual meeting, there has been a "shift from . . . treatments for handling and use in a reading room towards treatments concerned with the requirements of imaging systems."[13] Furthermore, Boal noted that "structural reinforcements and stabilization treatments were utilized with less frequency in contrast to humidification and flattening of materials for imaging."[14]

The formal education of research library conservators has also significantly shifted in the last decade. In 2009, the University of Texas at Austin conservation training program closed. As the only graduate-level training program specifically dedicated to training library and archives conservators in North America, its closure left a void for individuals hoping to gain professional credentials. As a result, the Andrew W. Mellon Foundation funded the development of book conservation training at the three American fine art conservation training programs: Buffalo State, the State University of New York; Winterthur/University of Delaware; and New York University. The first students from these programs specializing in library and archives materials graduated in 2013.[15] It is likely too soon to determine whether they possess a markedly different repertoire of treatments from each other or from graduates of the Texas program.

In addition to formal education changes over the past decade, the AIC Wiki has greatly expanded as a clearinghouse for documented treatment practices, among other topics.[16] Born as an electronic landing place for various types

of conservators' *Conservation Catalogs* (including the *Paper Conservation Catalog* and the *Book Conservation Catalog*), the AIC Wiki has been updated and expanded to new areas. Volunteers from the conservation community collaboratively share information about treatment practices and materials, preventive care, education and training, work practices, and research and analysis. Given the exponential increase in the depth, breadth, and accessibility of this resource, it is likely that conservators are consulting it more frequently for treatment advice than in 2007.

Surveys of Conservation Treatment Methods, 2007–2017

In the last decade, a few publications reported on surveys of book conservation treatment practices. In 2011, Teper and Straw described an assessment of leather treatment practices.[17] Their paper documented how frequently their fifty-seven respondents used standard treatments for leather books such as board reattachments, rebacking, hinge repair, and rebinding. They also gathered data on adhesives, consolidants, and materials used for repair. The survey respondents included book dealers, curators, and preservation administrators plus conservators. Also in 2011, Kearney explored the use of Japanese paper in leather repair, reporting on findings of an eight-question survey.[18] The study documented repair techniques and materials, and asked respondents to comment on why certain techniques were preferred. In 2016, Alexopoulou and Zervos, who conducted an international survey of paper conservation methods, found that conservators prefer time-tested techniques for dry-cleaning, washing, and deacidification to newer methods.[19]

On a broader scale, Peterson et al. reported on the implementation of a new high-level preservation statistics program, following the termination of the Association of Research Libraries (ARL) preservation statistics.[20] The National Preservation Statistics Survey did not gather details about specific preservation techniques, but rather captured extensive demographic information and an administrative view of current practices and staffing levels among research library preservation programs.

Table 1. Demographic characteristics and number of treatment cases, 2017

	Respondents	Treatment Cases		
Type	No.	Special Collections	General Collections	Total
Hybrid practitioners	57	57	57	114
Special collections only	51	51	-	51
General collections only	14	-	14	14
Total	122	108	71	179

Table 2. Respondents' institutions, 2007 vs. 2017

		2007		2017	
Question	**Response**	No.	%	No.	%
Size of institution	Fewer than 2 million volumes	24	33	17	14
	2-3 million volumes	28	38[a]	10	8
	3-5 million volumes			26	21
	More than 5 million volumes	21	29	69	57
Type of research library	ARL	59	81	101	83
	Non-ARL	14	19	21	17
Type of conservation/repair facility	Special collections only	2	3	11	9
	General collections only	7	10	2	2
	Centralized/hybrid facility	48	66	77	63
	Separate facilities	15	21	27	22
	Other	1	1	5	4
Year facility built or last renovated	2010s	N/A	N/A	32	30
	2000s	32	44	44	40
	1990s	16	22	21	19
	1980s	10	14	12	11
	Pre-1980s	10	14	N/A	N/A
	Other	5	7	N/A	N/A

[a] The 2007 survey had only three categories for institution size, with the middle category encompassing "2–5 million volumes."

Survey Method

Survey Goals and Scope

To ensure consistency and determine whether changes to the survey instrument were warranted, both the 2007 survey data and literature from the past decade were reviewed. Treatments that were deemed extremely low-use in 2007 would not be included in the 2017 survey if there were no new publications or references to them in the ensuing decade. These changes were not made lightly to maintain continuity for comparison with the 2007 data. Nevertheless, three treatments fit the description: (1) leather-covered box, which 4 percent of special collections and 2 percent of general collections practitioners reported as standard practice in

2007; (2) paperback stiffening, which 4 percent of special collections and 12 percent of general collections practitioners had reported as standard practice; and (3) in-house use of Wei T'o deacidification spray, which 9 percent of special collections and 5 percent of general collections practitioners had reported as standard practice. Moreover, the literature was examined to identify any new book treatment techniques for both general and special collections introduced in published form, through workshops, or via social media in the last decade. Included in the search were proceedings of professional meetings such as AIC's *Book and Paper Group Annual*, the AIC Wiki, and less formal social media outlets such as blogs of individual conservators.

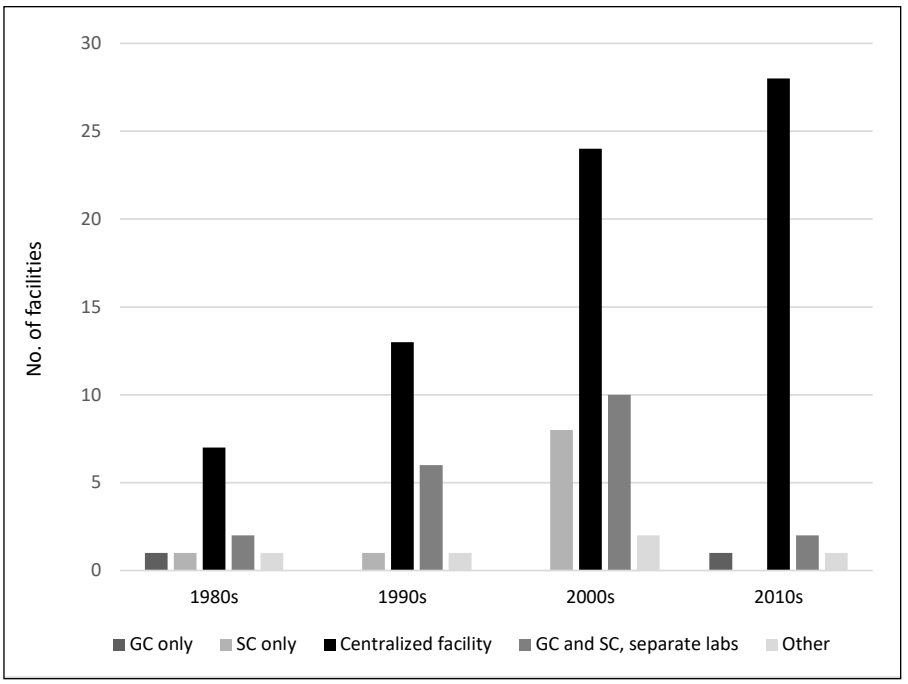

Figure 1. Facility type vs. decade renovated

While most of the techniques identified in this search were more relevant to book arts, a few new conservation techniques associated with minor paper treatment and textblock repair had received widespread publicity: the use of remoistenable and solvent-set tissues in mending paper and toning Japanese paper for mends or fills. Remoistenable and solvent-set mending tissues were the topic of many publications since 2007 and a series of hands-on workshops hosted by the American Institute for Conservation and the Guild of Book Workers.[21] The toning of Japanese paper was perceived as a common practice in many labs that was inadvertently omitted from the 2007 survey.

The overarching research questions for the 2017 survey include four questions that are identical to those posited in 2007, plus one addition:

- What constitutes the "standard toolbox" of book conservation treatments for general and special collections near the beginning of the twenty-first century?
- Are the same types of treatments employed for general collections as special collections?
- Which treatments are applied similarly in both contexts?
- Which are more common in one context or the other?
- New: Have treatment practices changed in the last ten years? If so, how?

Survey Design

To compare practices over time, the survey structure developed ten years ago was reused. Advances in survey technology in the ensuing decade facilitated improvements in data analysis and lowered operator error. The new technology targeted survey candidates with personalized invitations and follow up messages, which may have increased participation. Qualtrics software was selected for the 2017 survey.

The survey instrument consisted of four sections: audience definition and participation disclaimer, demographic questionnaire, treatment questionnaire(s), and a request for voluntary follow-up (appendix A). To ensure the survey's relevance to both general and special collections practitioners and to permit a comparison of practices, the questionnaires pertaining to general and to special collections treatment practices were identical, containing fifty-four treatments in seven categories that could be applied to bound materials in either a general or special collections setting: (1) protective enclosures, (2) binding reinforcements, (3) minor paper treatments and textblock repairs, (4) board reattachment methods, (5) rebinding styles, (6) binding repair techniques, and (7) advanced paper treatments performed on bound materials.[22] Where treatment names were not sufficiently self-explanatory, definitions were supplied with the treatment (see appendix B).

The survey design enabled respondents to provide treatment information—as appropriate to their responsibilities—for only general collections treatment, only special collections treatment, or both. Individuals with responsibility for one type of collection—general collections *or* special collections—were asked to complete one page of identical treatment questions, while respondents with responsibility

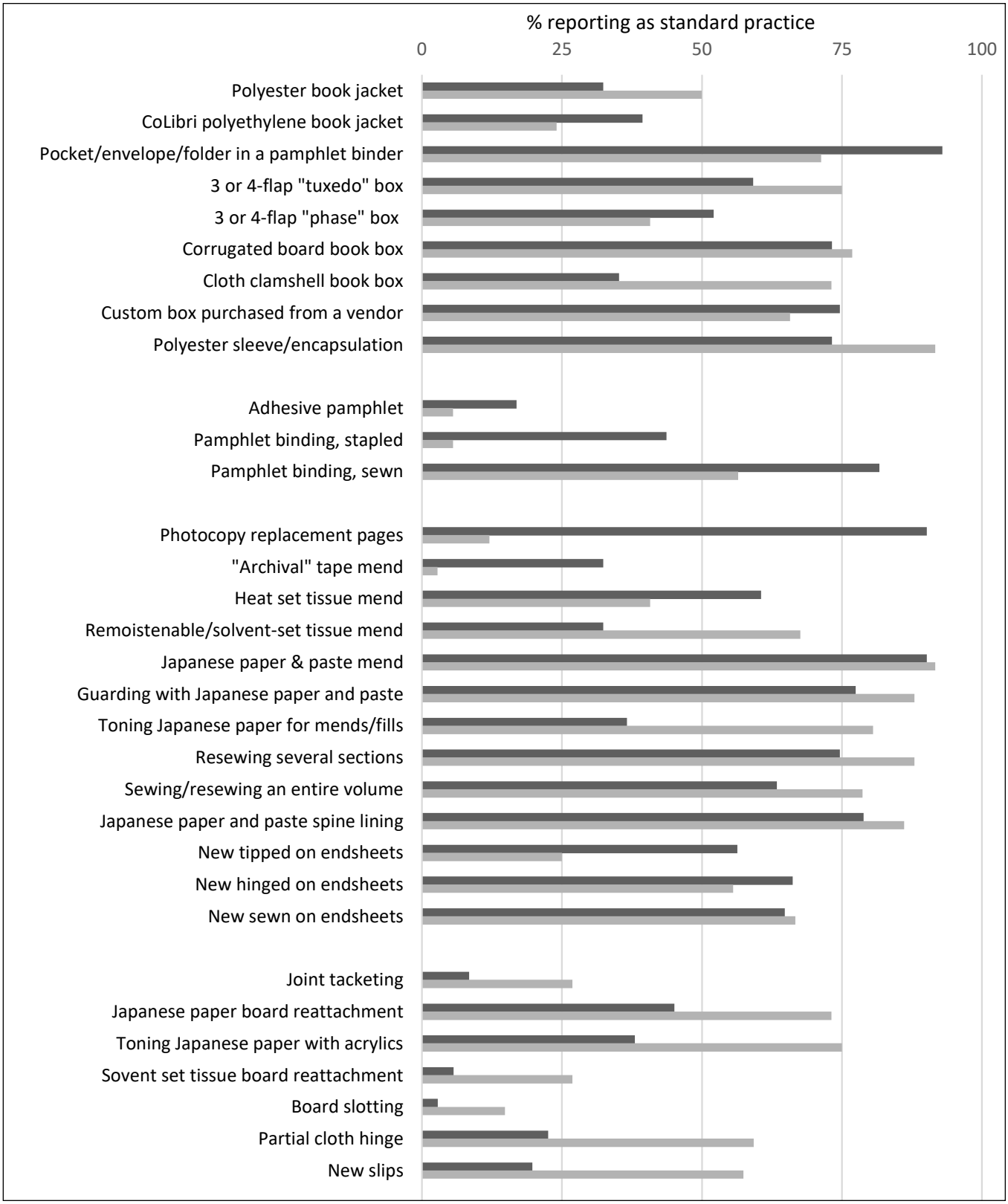

Figure 2 (part 1). Treatment practices employed for general and special collections, 2017

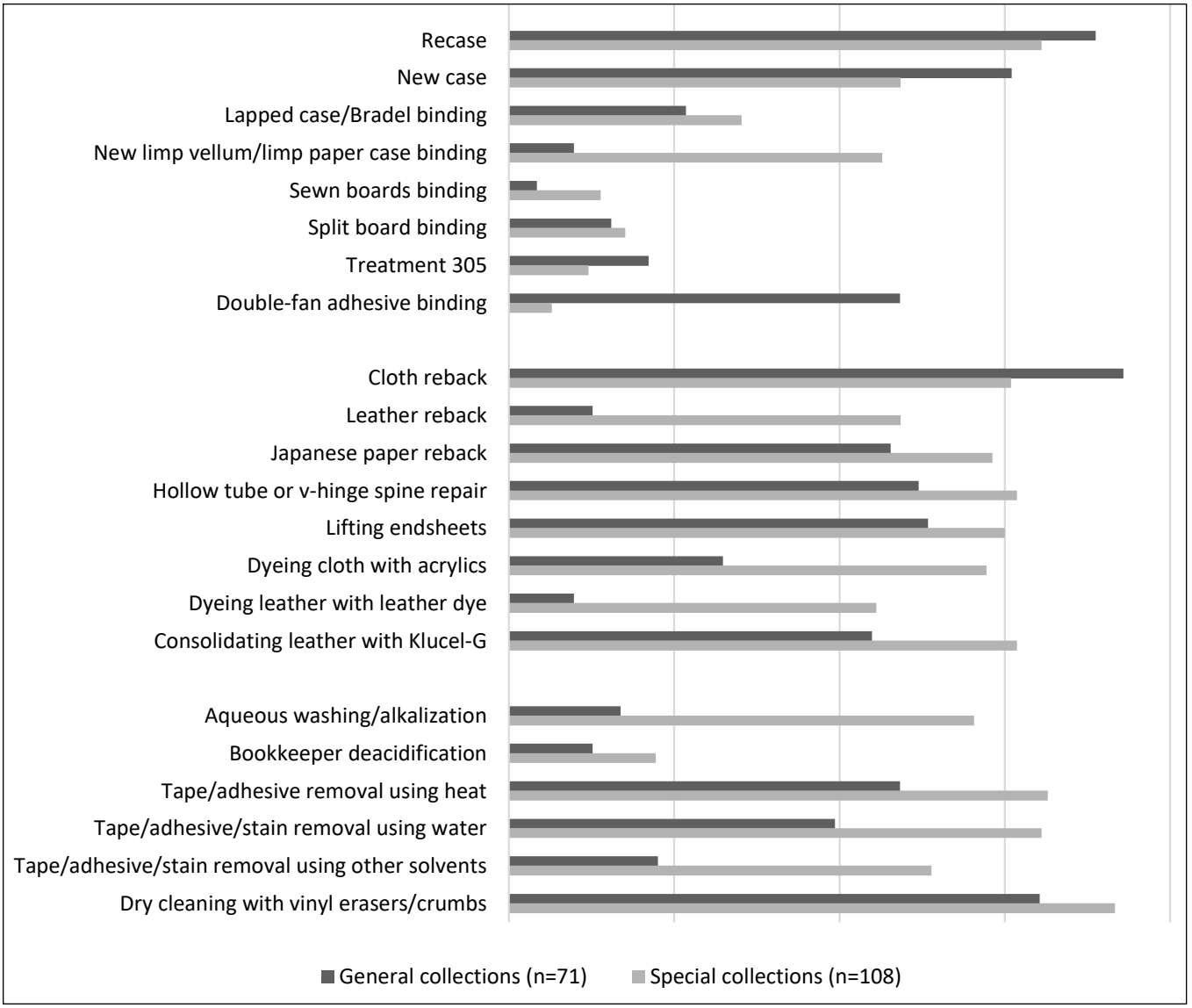

Figure 2 (part 2). Treatment practices employed for general and special collections, 2017

for both general collections and special collections received two pages of questions, one for each type.

As in 2007, the survey prompted respondents to identify how routinely during the past three years they used each treatment by selecting from a set of response options. When the response options were developed in 2007, the authors avoided references to quantitative terms such as "weekly" or "monthly"; overly vague entries like "frequently" or "rarely"; and to specific production output levels that might favor larger repair operations over smaller. The 2017 survey retained the five treatment response options employed in 2007: (1) standard practice, frequent; (2) standard practice, occasional; (3) anomalous use only; (4) never; and (5) not sure. Following each category of treatment, respondents were invited to list other treatments in a free-text field.

Because the original survey underwent rigorous pretesting to refine the treatments, treatment definitions, and treatment frequency response options, pretesting for the 2017 survey focused primarily on operability of the survey platform, although other feedback was welcomed. Seven pretesters—representing individuals trained in various graduate programs or by apprenticeship and at various points in their careers—reviewed the 2017 survey.

Survey Implementation

The 2007 survey was evaluated and updated to ensure a more robust and representative response in the 2017

version. Improvements in survey technology aided in this process. In 2007, the survey was distributed through various professional discussion lists via a common web link. Respondents were invited to answer once for each treatment facility and international participation was encouraged. Although the survey was anonymous, 81 percent of respondents voluntarily identified themselves, affording insight into the response pool. Most respondents were from ARL or Independent Research Libraries Association (IRLA) institutions. Additionally, only six respondents were from outside the US. Before analysis, international data was omitted because it was insufficient to support generalizations about international practices or comparisons to US practices.[23] To facilitate comparison to the 2007 data, the 2017 survey was limited to respondents from ARL and IRLA libraries in the US.

As survey technology improved, and because there was no way to ensure that only one person per lab answered the survey in 2007, multiple responses per institution were included to more accurately capture standard practices across the field. In many smaller institutions, there would still be one respondent as in 2007, but for larger institutions, multiple respondents could participate, enabling a clearer picture of how research library collections are treated overall. Furthermore, since large institutions often employ conservation professionals with diverse training experiences, greater participation could invite wider perspectives.

The 2017 survey respondents were gathered from ARL and IRLA libraries in the US. A list of conservation practitioners at these institutions was compiled via a search of institutional websites and the AIC member directory. Personalized email invitations were distributed via the Qualtrics survey tool. The survey asked respondents to suggest colleagues at their institution who might not have received a survey invitation or who might be better suited to respond to the survey. While most of the individuals suggested through this process had already been invited to participate, a few new individuals were identified and sent the survey link. The initial survey invitations were sent to 198 individuals. An additional fourteen were suggested by respondents, for a total of 212 individuals invited during the survey period.

When the survey went live, two annual

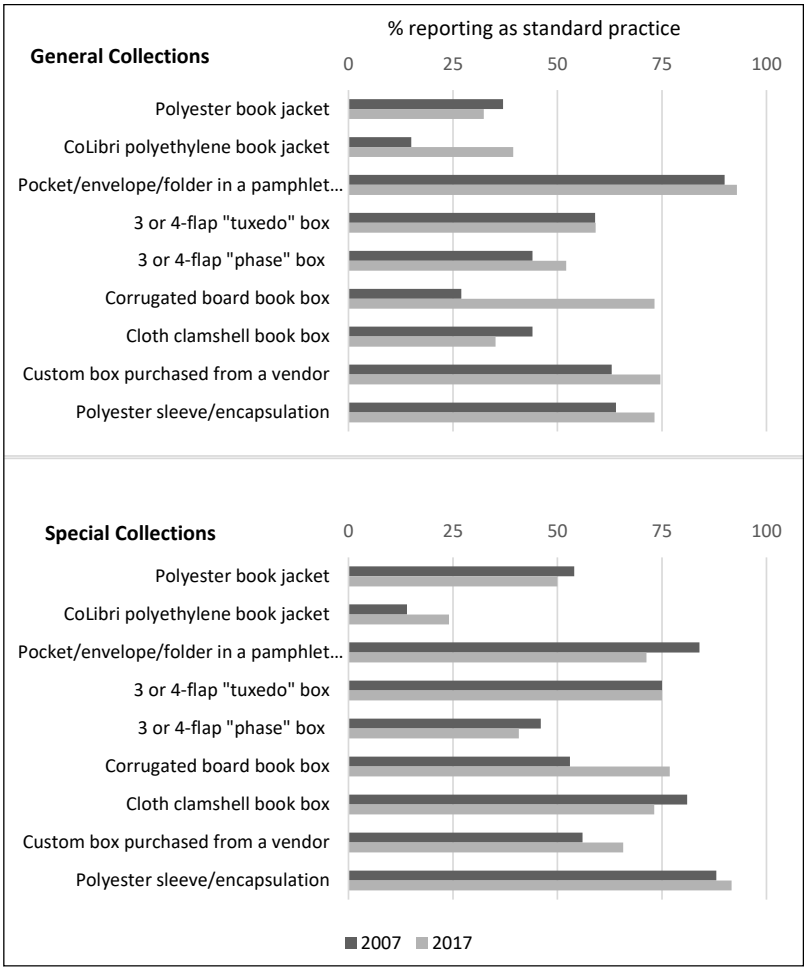

Figure 3. Protective enclosures, 2007 vs. 2017

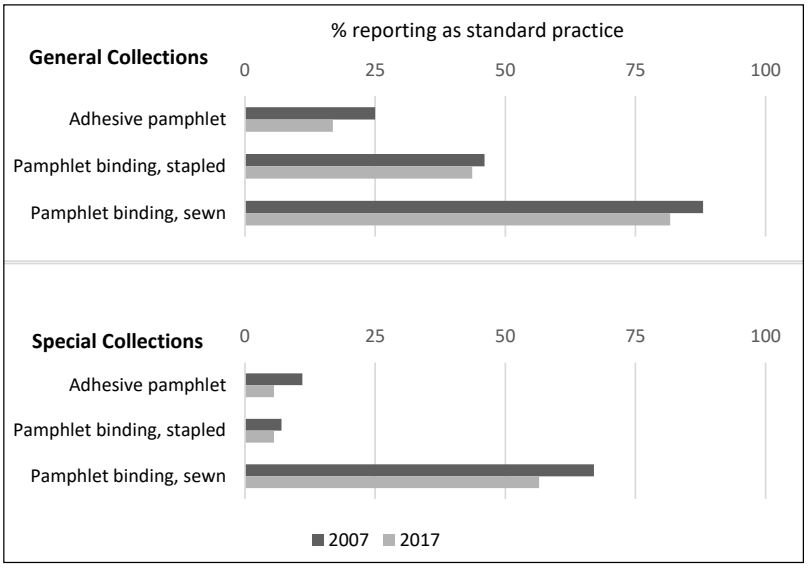

Figure 4. Binding reinforcements, 2007 vs. 2017

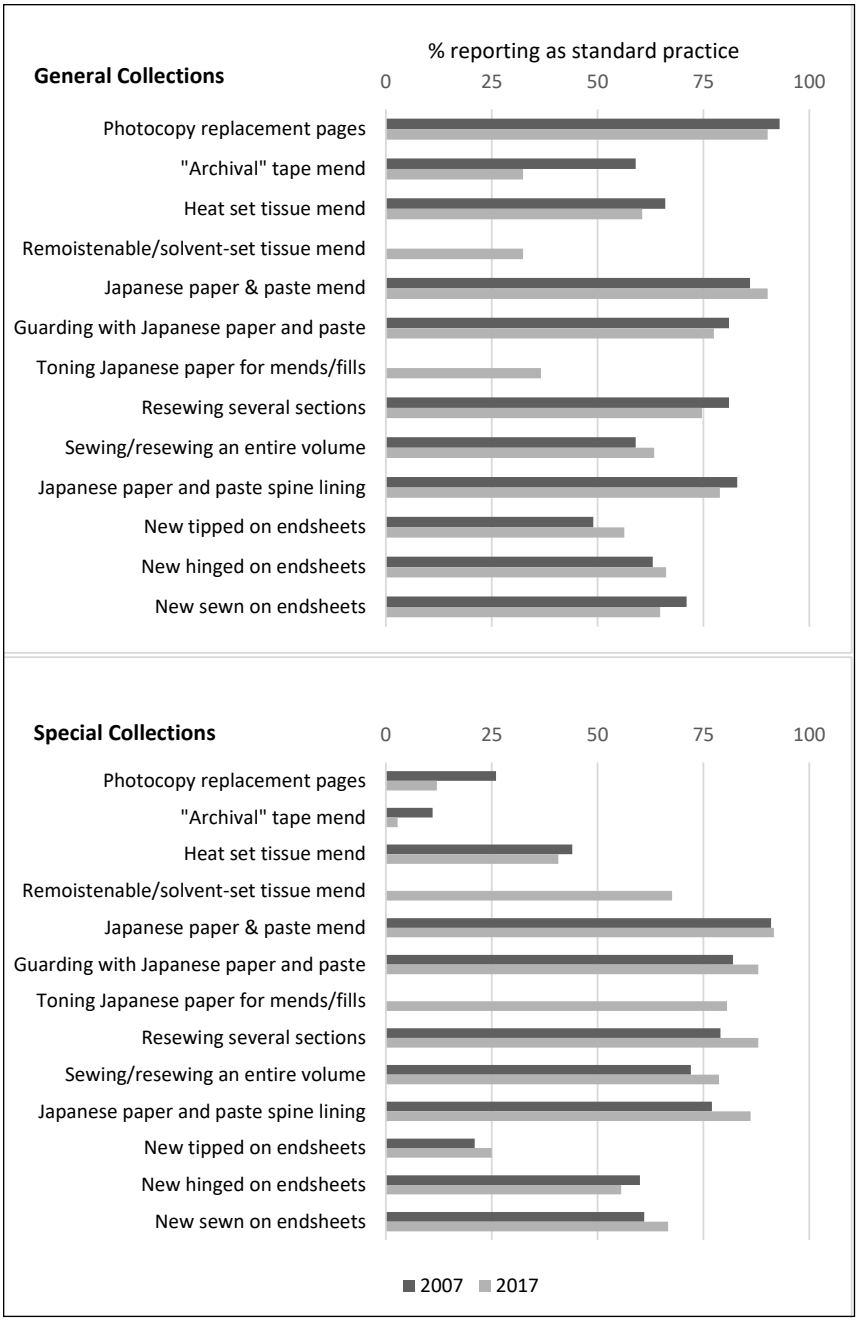

Figure 5. Minor paper treatments and textblock repairs, 2007 vs. 2017

meetings attended by many conservation and preservation professionals also took place. To promote the survey, informational cards about the research were distributed among potential respondents at the 2017 AIC Annual Meeting in Chicago. Although not all the targeted survey audience attended the meeting, this effort may have increased the survey sample size. Additionally, while the survey was live, it was announced during an open informational session at the Preservation Administrators Group at the ALA Annual Conference. The survey period ran from June 22 to July 21, 2017. All respondents who had not completed the survey after two weeks and those who had started but not finished it were sent a reminder email with the same personalized link based on email addresses, generating a wave of additional responses in early July.

Survey Limitations

Although the survey results have a high degree of confidence, some potential sources of error are associated with the survey process. Despite attempts to locate everyone qualified to participate in the survey, it is possible that not all preservation professionals employed by all ARL and IRLA libraries were contacted. It was difficult to confirm that all individuals had been reached with 100 percent confidence, especially at institutions without a preservation department. Contact information on library websites may have been incomplete or outdated. At those institutions, book repair may be located in technical services, collection development, or some other area, and despite extensive searching, one could not be completely confident that repair activities did not take place at those institutions because of limited or no web presence.

Institutional websites vary greatly in quality; in some instances, employee directories were not conducive to searching for job titles, and some preservation employees had non-descriptive, generic titles such as "library assistant," making it difficult to determine job function from a directory listing. In a few cases, libraries did not have a publicly searchable list of employees, so professional membership directories were consulted even though not every conservation professional is a member of a professional organization.

Additionally, some individuals may not have received the survey announcement because of email spam filtering, others might have felt unqualified to participate, and others might have experienced unreported technical difficulties with the survey that may have resulted in failed response attempts. Some individuals indicated that they took the

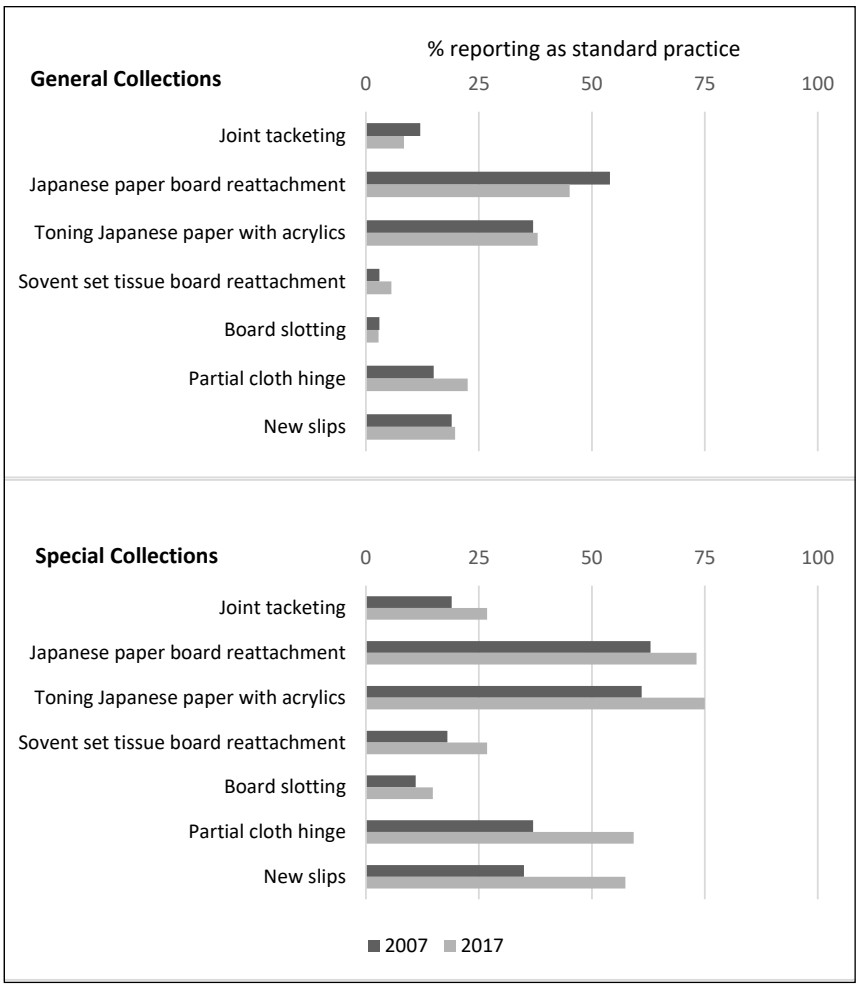

Figure 6. Board reattachment methods, 2007 vs. 2017

survey on behalf of everyone in a department or conservation laboratory rather than allowing all practitioners to take the survey for themselves. When individuals replying for the entire lab indicated as much in the survey comments, they were encouraged to allow each person to respond individually, but that did not always happen. Although fact based, the survey was based on people's perceptions of what constitutes "standard practice"; some respondents may have reported inflated or deflated practices based on aspirations or humility rather than actual practice.

There are some sources of error associated with the survey instrument itself. Not all treatments may have been recognizable to survey respondents even when descriptions were included with treatment names in the survey. Despite extensive research, some common treatments may have been missed. Finally, while the 2017 survey software provided analytical tools that have greatly decreased human error in analysis, some human error was still possible in interpreting results.

Survey Results

Demographic Characteristics

Of the 212 invited, 122 respondents from US research libraries fully completed the survey, resulting in a 58 percent response rate. When compared with seventy-three respondents in 2007, this total represents a 40 percent increase. Because the respondent population size has been calculated, the 2017 survey response rate has a much greater degree of confidence than for the 2007 survey, in which the respondents answered anonymously and the population size was unknown. Ninety-eight percent of respondents provided contact information, indicating willingness to respond to follow up questions if necessary.

The survey sample was relatively diverse with respect to collected demographic characteristics; respondents were almost evenly matched between those holding positions with hybrid responsibilities involving both special and general collections (47 percent) and those working only with special collections (42 percent). Only 11 percent of respondents worked solely with general collections. The 122 respondents provided a total of 179 treatment cases because the fifty-seven hybrid respondents were asked to complete two treatment questionnaires, one for each type of collection, while the remaining 65 respondents completed one questionnaire each (see table 1).

More than half of respondents worked for institutions with over five million volumes, a significant increase over the 2007 survey results (57 percent, compared with 29 percent in 2007). This may be partly attributed to allowing multiple responses per institution rather than one summary response, as large institutions typically employ many conservators. The number of respondents from mid-size libraries remained relatively constant, while the number of respondents from institutions with fewer than two million volumes declined. With respect to their conservation facilities, two-thirds of respondents (63 percent) work in a centralized or hybrid facility and almost a third (30 percent) work in a facility that was built or renovated since 2010 (see table 2).

The 2017 data for facility type and decade of construction or renovation were correlated to determine which types of facilities have been most common over time. The data confirm the continuation of a trend observed in the first study: the vast majority of new or renovated laboratories are

hybrid facilities serving both general and special collections (see figure 1).

Treatment Practices

The collected data pertaining to treatment practices were compiled and graphed, comparing general collections and special collections practices. Each treatment was classified—once for general collections and again for special collections—as either "standard practice," "moderate use," or "low use." A treatment was designated "standard practice" when it was reported as "standard practice, frequent" or "standard practice, occasional" by 50 percent or more of the respondents. Treatments reported as standard practice by 25 to 49 percent of conservation units were designated "moderate use," while the remaining treatments—those considered standard practice by fewer than 25 percent of units—were designated "low use."

Further discussion of the data follows, organized by category of treatment with both a comparison of general and special collections practices in 2017 and a comparison of how general and special collections treatments have changed since 2007 within those respective categories. Figure 2 shows the overall 2017 data for both general and special collections; graphs comparing responses from 2007 and 2017 are provided individually.

Figure 7. Rebinding styles, 2007 vs. 2017

Protective Enclosures

The data indicate that protective enclosures are regularly employed in the treatment of both general and special collections; in 2017, six of the eight enclosures qualified as standard practice for general collections and seven for special collections. Only one qualified as low use and only for special collections: Colibri book jackets. Difference in practice between general and special collections was most pronounced for the cloth clamshell box, which is significantly more common to special collections, a difference of [Δ] 38 percentage points.[24]

In 2017, four types of protective enclosures were more common to general than special collections: Colibri book jacket (Δ 15), pocket/envelope/3 or 4-flap folder in a pamphlet binder (Δ 22), 3- or 4-flap "phase" box (Δ 11), and custom boxes purchased from a vendor (Δ 9). The five treatments more common to special collections were polyester book jacket (Δ 18), 3 or 4-flap "tuxedo" box (Δ 16), corrugated clamshell book box made in-house (Δ 4), cloth clamshell box (Δ 38), and polyester sleeve encapsulation (Δ 19) (see figure 2).

A comparison of the data from 2007 to 2017 shows a marked move toward more utilitarian, mass-produced, and less expensive enclosures in both general and special collections contexts. Corrugated book boxes constructed in-house, ordering custom boxes from a vendor, and Colibri dust jackets are much more commonly employed in 2017 than in 2007 (see figure 3).

Binding Reinforcements

As reported in 2007, this category still includes many of the least commonly employed treatments; changes since 2007 for use in both general and special collections were

quite small in this category. Only one type of binding reinforcement was reported as standard practice in 2017 for both general and special collections: sewn pamphlet binding. This treatment is much more commonly employed in a general collections context (Δ 26), although it is a common practice for both types of collections. Adhesive pamphlet binding was reported as very low use for both general and special collections, and stapled bindings were moderate use for general collections but low-use for special collections (see figure 2). All treatments in this category continue to be more frequently used in the general collections context. All treatments in this category decreased slightly in 2017 for both general and special collections (see figure 4).

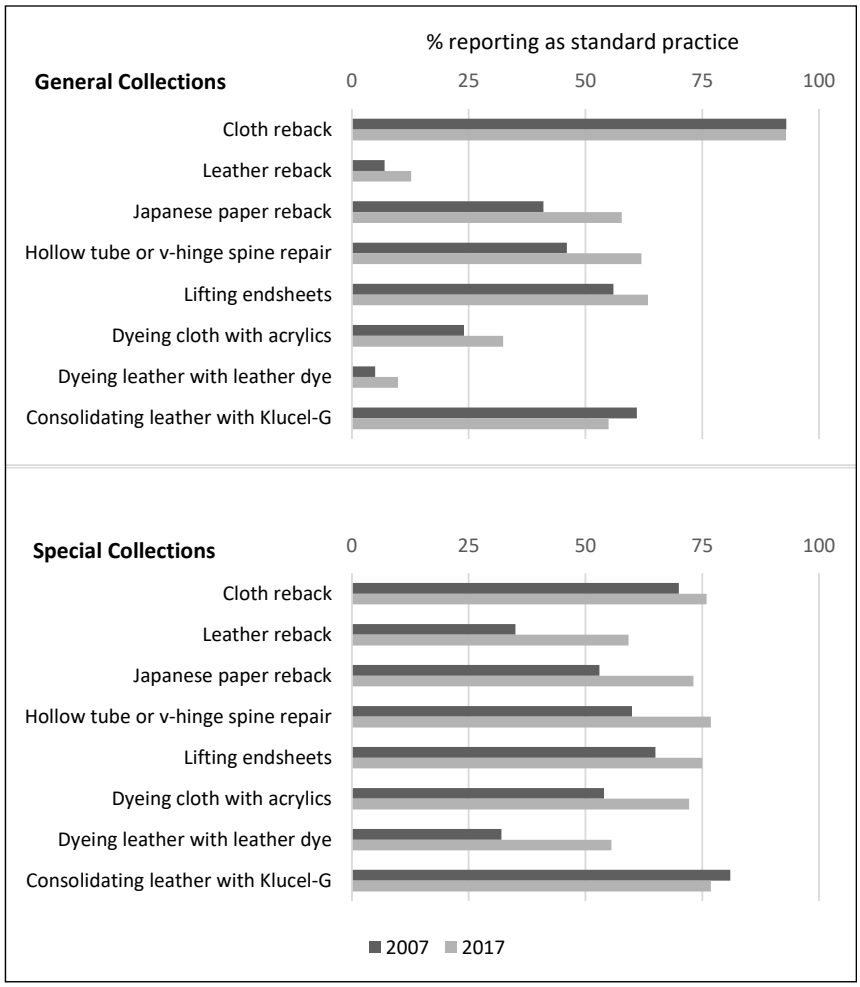

Figure 8. Binding repair techniques, 2007 vs. 2017

Minor Paper Treatments and Textblock Repairs

This category of thirteen treatments includes ten that were reported in 2017 as standard practice for general collections and nine for special collections. This category includes the treatment with the greatest disparity in use between general and special collections: photocopied replacement pages, with a Δ of 78 percentage points. The majority of the treatments in this category are highly employed in both contexts, however "archival" tape mending (Δ 29), heat-set tissue mending (Δ 20), and new tipped-on endsheets (Δ 31) are much more common in the general collections context. Conversely, toning Japanese paper for mends or fills (Δ 44) and using remoistenable tissue mending (Δ 36) are much more common in the special collections context (see figure 2). The other treatments in this category were quite similarly employed in both contexts in 2007 and continue to be in 2017. The new additions to the survey (remoistenable tissue mending and toning Japanese paper) were much more commonly used in the special collections context (see figure 5).

Board Reattachment Methods

This category includes treatments not commonly employed in general collections—none was considered standard practice in 2017. Four were considered standard practice for special collections: Japanese paper board reattachment, toning Japanese paper with acrylics, partial cloth hinge, and new slips; two were moderate use: joint tacketing and solvent-set tissue board reattachment. Only board slotting was low use in the special collections context. In contrast, most of these treatments were low-use for general collections, with only Japanese paper board reattachment and toning Japanese paper with acrylics rising to the "moderate use" category (see figure 2).

When compared with the 2007 data, Japanese paper board reattachment has fallen from a standard practice in the general collections context to a "moderate use" treatment. As found in 2007, all of these treatments are more commonly employed in the special collections context, and all treatments in the special collections category rose in frequency of use since 2007 (see figure 6).

Rebinding Styles

For the 2017 data, recase and new case are considered standard practice for both general and special collections.

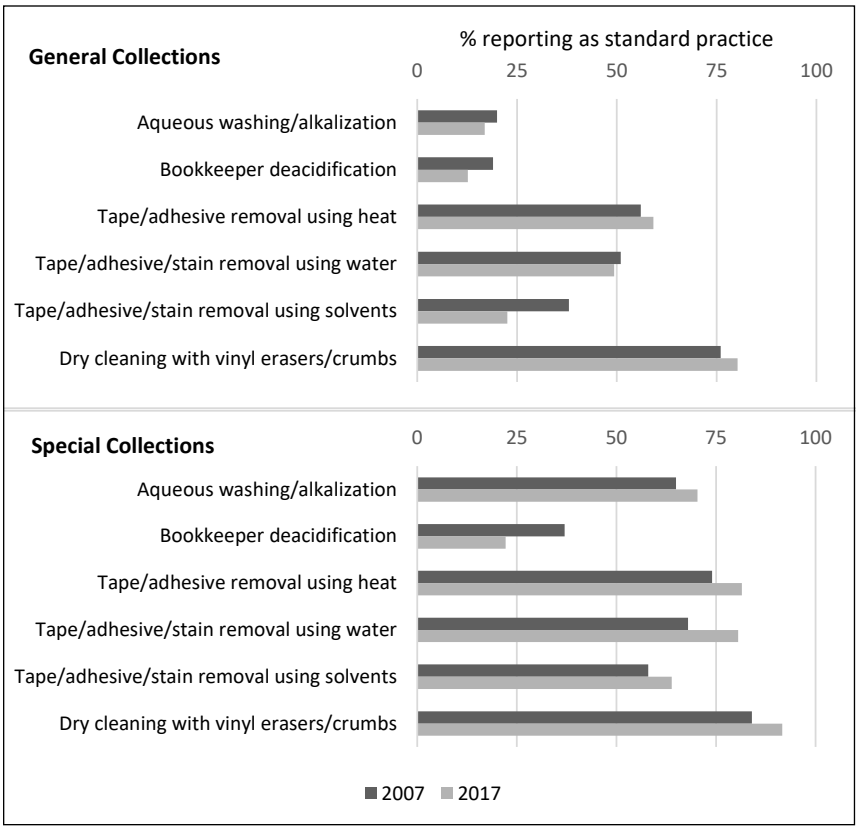

Figure 9. Advanced paper treatments, 2007 vs. 2017

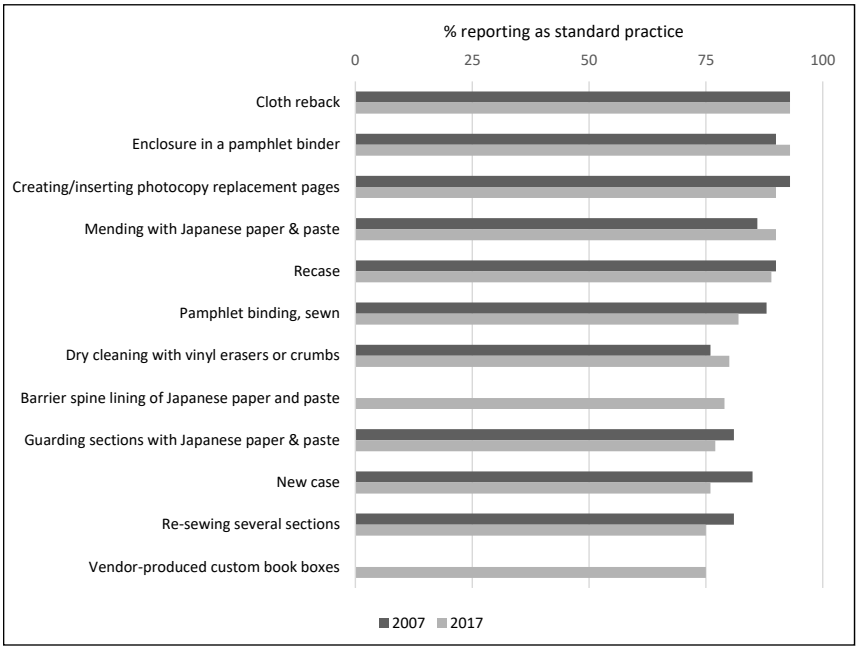

Figure 10. General collections treatments reported as standard practice by ≥75% of respondents, 2007 vs. 2017

Furthermore, new limp vellum/paper case is standard for special collections materials and double-fan adhesive binding for general collections—both of these treatments increased in frequency since 2007. Three of the rebinding styles were more common to general collections: recase, new case, and double-fan adhesive binding. The treatment with the greatest difference in practice is double fan adhesive binding, with Δ 53 percentage points in favor of general collections. A close second is new limp vellum/limp paper case binding, with a Δ 47 percentage points in favor of special collections. The other treatments were employed at quite similar rates between general and special collections, with differences of 17 percentage points and below. Sewn boards binding, Treatment 305, and split board binding are low use in both contexts (see figure 2).

When compared with the 2007 findings, recase and new case continue to be standard practice in both contexts. There was a marked increase in the use of vellum/paper case bindings in the special collections context and a marked increase in the use of Treatment 305 for general collections, although it is still in the low-use category (see figure 7).

Binding Repair Techniques

All the treatments in this category were considered standard practice in the special collections context and five of the eight were standard practice for general collections. All but one treatment in this category were much more common in the special collections context, the exception being cloth reback. The most significant gap between general and special collections was for two treatments with Δ 46 percentage points: leather reback and dyeing leather with leather dye. Dyeing cloth with acrylics had a Δ 40, also in favor of special collections (see figure 2).

All general and special collections treatments remained the same or increased in application frequency since 2007 with the exception of consolidating leather with Klucel-G. For general collections, the greatest increases appeared for Japanese

paper reback and using a hollow tube or v-hinge for spine repair. For special collections, quite a few treatments showed significant increases, including leather and Japanese paper rebacks, dyeing cloth with acrylics and leather dye, hollow tube or v-hinge spine repair, and lifting original endsheets (see figure 8).

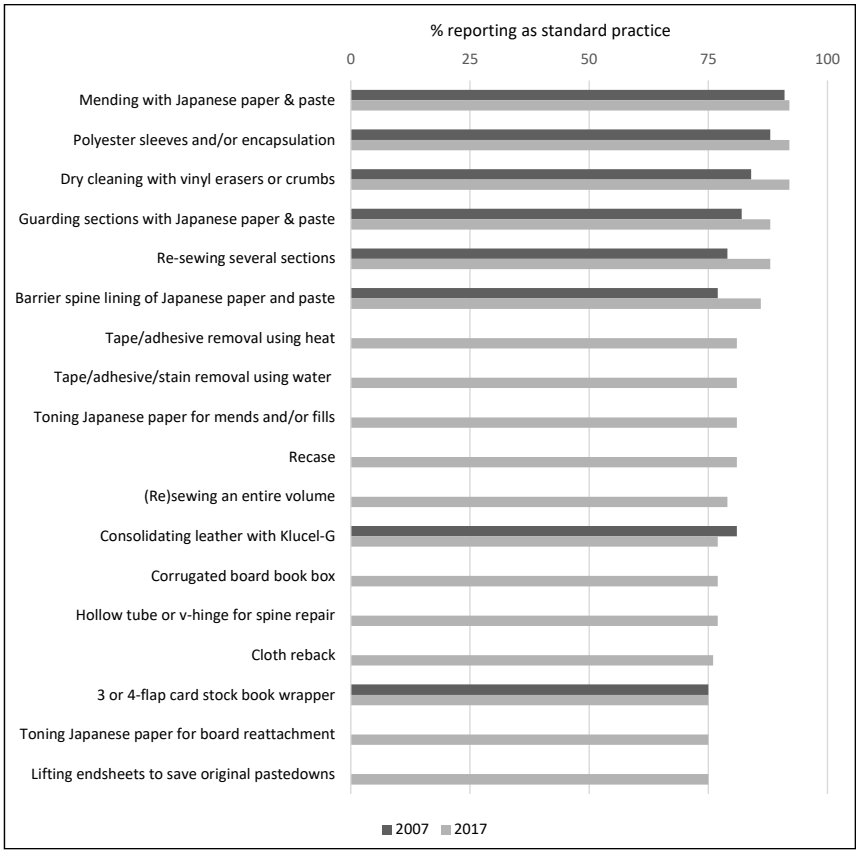

Figure 11. Special collections treatments reported as standard practice by ≥75% of of respondents, 2007 vs. 2017

Advanced Paper Treatments Performed on Bound Materials

In 2017, all but one of the treatments in this category were standard practice for special collections; the exception was the use of Bookkeeper deacidification spray, which was low-use for both general and special collections. In the general collections context, there was a mixture of standard practice, moderate use, and low-use treatments. Dry cleaning with vinyl erasers or crumbs was very commonly employed in both types of collections, as was true in 2007 (see figure 2).

When compared with the 2007 data, all treatments in this category continue to be more common to special collections than to general collections: aqueous washing and deacidification had a Δ 38 in 2007 in favor of special collections. The gap has now widened considerably, to Δ 53 between general and special collections use. The use of Bookkeeper spray is less common in both contexts than in 2007. Only two treatments increased in frequency of use in the general collections context: tape removal with heat and dry cleaning with vinyl erasers or crumbs. Overall, changes in this category were subtle (see figure 9).

Highly Standard Practice Treatments

Treatments reported as "standard practice" by 75 percent or more of respondents were classified as "highly standard practice," comparing what was identified in 2007 with what was added in 2017. For general collections, there was surprisingly little change: all ten highly standard practice treatments from 2007 remain on the list. There were only two additions: using a barrier lining of Japanese paper and paste in rebinding treatments (79 percent) and custom book boxes purchased from a vendor (75 percent) (see figure 10). The data indicate that general collections treatments are well codified, perhaps because of decades' worth of published book repair manuals and book repair workshops. Conversely, the research indicates that not much innovation in treatment practice has occurred in general collections practice in the past ten years.

For special collections, eight of the ten highly standard practice treatments from 2007 remain on the list, with two falling off, both in the category of protective enclosures: pocket or envelope in a pamphlet binder and cloth clamshell box. Ten additional treatments were added to the highly standard practice list for special collections: tape/adhesive/stain removal using heat; tape/adhesive/stain removal using water; toning Japanese paper for mends or fills; recase; (re)sewing an entire volume; corrugated board book box; reattaching detached spines with a hollow tube or v-hinge; cloth reback; toning Japanese paper with acrylics for board reattachments; and lifting endsheets to save original pastedowns (see figure 11). The many additions to the special collections list may reflect an increased or increasing focus on special collections materials in the context of the rise of distinctive collections, may be a feature of conservation training being more focused on high-end treatments, or may reflect an increased respondent pool for special collections treatments. Should the survey be replicated in 2027, it will be interesting to note if the highly standard practices for

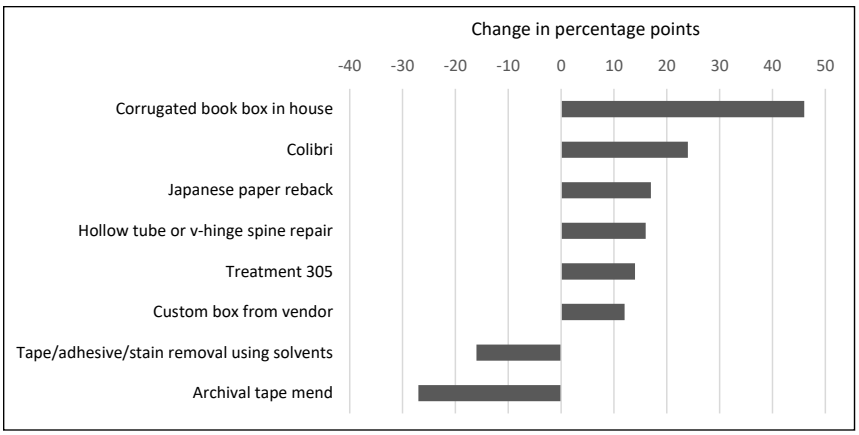

Figure 12. General collections treatments moving ten or more percentage points, 2007 to 2017

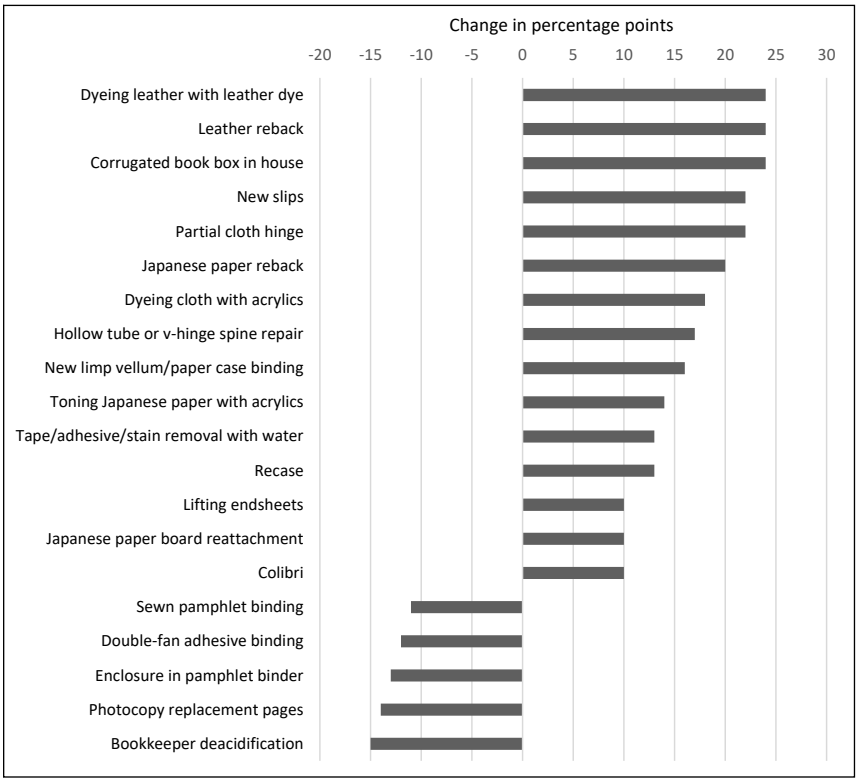

Figure 13. Special collections treatment moving ten or more percentage points, 2007 to 2017

special collections have become more codified, similar to what has been observed in the general collections context.

Treatments with Significantly Different Adoption Levels in 2017 Versus 2007

The 2007 and 2017 data were also analyzed for significant differences in "use frequency." A shift of ten or more percentage points was considered significant. Generally, for both general and special collections, many more treatments increased in popularity than decreased. In some cases, the difference was significant enough that treatments shifted into a new category, while for others, given that the categories were segregated in twenty-five-point increments, the treatments shifted but stayed in the same designations of "low use," "moderate use," or "standard practice."

By these criteria, in the general collections context, six treatments were employed significantly more in 2017 than in 2007. In the category of protective enclosures, the in-house construction of corrugated book boxes (Δ +46), the use of Colibri dustjacket protectors (Δ +24), and using vendors to make custom enclosures (Δ +12) increased noticeably. Two repair techniques are used more frequently in 2017: Japanese paper reback (Δ +17) and hollow tube or V-hinge spine repair (Δ +16). One relatively low-use rebinding technique, Treatment 305, significantly increased in popularity (Δ +14). Only two treatments showed significantly reduced adoption levels in the general collections context in 2017 versus 2007: stain removal using solvents (Δ -16), and "archival" tape mending (Δ -27) (see figure 12). No general collections treatments decreased in frequency while staying in the same category.

In the special collections context, fifteen treatments showed significantly increased adoption levels. Five treatments newly qualified as standard practice: toning leather with dye (Δ +24), leather reback (Δ +24), new slips (Δ +22), partial cloth hinge (Δ +22), and new limp paper/vellum case binding (Δ +16). These treatments all require high-end skills for successful completion, perhaps supporting the view that special collections treatments have become more refined. Additionally, ten treatments that were standard practice in 2007 showed significantly increased adoption rates. Of the protective enclosures studied, the in-house construction of corrugated book boxes (Δ +24) and Colibri dustjackets (Δ +10) increased significantly, perhaps because they are less time-consuming and more economical to execute and do not use any damaging

adhesives. Taking the time to tone repair material—dyeing cloth with acrylics (Δ +18) and toning Japanese paper with acrylics (Δ +14)—also saw significantly increased adoption rates. The already-popular use of Japanese paper as a repair material also increased significantly, both when used to perform rebacks (Δ+ 20) and as board reattachments (Δ +10). Additional increases were found with spine repair incorporating a hollow tube or v-hinge (Δ +17); recasing (Δ+13); the use of water as a solvent for tape, adhesive, and stain removal (Δ + 13); and lifting original endsheets to preserve them during binding repair (Δ +10) (see figure 13).

In the special collections context, two treatments involving pamphlet structures that qualified as standard practice in 2007 saw significant decrease in popularity in 2017: sewn pamphlet binding (Δ -11) and a pocket, envelope, or flapped enclosure in a pamphlet binder (Δ -13). Two treatments identified in 2007 as low-use in special collections continued their decline: inserting photocopied pages to replace missing text (Δ -14) and the use of double-fan adhesive binding (Δ -12). Likewise, the use of Bookkeeper deacidification spray declined from moderate to low use (Δ -15).

Conclusion

This paper compares the findings of a 2007 survey and the current 2017 survey to establish and further refine a "standard toolbox" of treatments for general and special collections in the early twenty-first century. This study is unique in that it provides a quantitative synopsis of book conservation techniques employed in 2017 versus those of a decade prior—providing insight into the trajectory of conservation treatment approaches in research libraries. As noted in a publication about the 2007 survey, the study's designation of "standard practice," "moderate use," and "low use" treatments "can inform practitioners, administrators, conservation professionals, and those in related fields by facilitating peer-to-peer benchmarking of current practices."[25] By providing insight into the field's adaptation of newer and more effective treatments, the data also suggest areas for further professional development.

The treatment practices detailed here may continue to help codify practice through the specification of a core group of book conservation treatment techniques employed by many research libraries. The data help to clarify and reconcile actual practices versus theoretical best practices for book conservation and repair. The survey data indicate that treatments widely adopted as standard practice in the general collections context have changed relatively little in the last decade, affirming the existence of a defined "standard toolbox" of treatment techniques. In the special collections context, however, the survey data indicate that practices continue to evolve. The ten treatments newly qualifying as "highly standard practice" for special collections may point to significant shifts in practice in the field. These changes may result from a greater response rate from the 2017 practitioners or an increase in special collections conservator positions.

A second study will be conducted with the 2017 data to correlate survey responses to a variety of demographic factors such as type of practitioner, practitioner training, library size, and type of conservation facility and to compare the data with that collected in 2007. The survey may be replicated in 2027 to continue to track longitudinally the changes in conservation treatment, and to further explore these changes and how they relate to the rapidly evolving context of research libraries.

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22. In the 2007 survey, categories 5 and 6 were combined into one section. In 2017, the sixteen treatments were separated into two groups of eight for more clearly defined categories and ease of survey response. The treatments in those categories are identical to those in 2007.
23. Baker and Dube, "Identifying Standard Practices in Research Library Book Conservation," 25.
24. When referring to "points" in the treatment practice sections, please note that "points" always refers to "percentage points."
25. Baker and Dube, "Identifying Standard Practices in Research Library Book Conservation," 31.

Appendix A: Survey Instrument

Book Conservation and Repair in Research Libraries

Introduction

Your participation in this survey—"Book Conservation and Repair in Research Libraries"—will help document book current conservation treatment practices and trends in U.S. research libraries. Survey results will be widely disseminated, including a comparison of current practices with those captured in a similar survey ten years ago.

The survey should be completed by individuals performing or overseeing book conservation treatment or repair in research libraries. Appropriate to a respondent's job responsibilities, the questionnaire will inquire about special collections treatment, general collections treatment, or both.

Do you oversee and/or perform book conservation repair or treatment in a research library?

- Yes
- No

Referral page

If there is someone else at your institution who performs or oversees book conservation treatment please provide their names and email addresses:

Survey Disclaimer

Participation in the study entails completion of a questionnaire that should take approximately 15 minutes to complete. You will be asked whether you perform specific conservation treatments, and asked to provide some basic demographic information about yourself and your institution. We do not anticipate any risks to you from participating beyond than those encountered in daily life.

While there are no direct benefits to participating, information obtained from this study will enable library professionals to gain insight into current conservation treatment practices, including how they have evolved over the past ten years, a period which has seen significant change in the training of conservation professionals. Information gained from the study will be widely shared.

Your participation, while solicited and encouraged, is strictly voluntary, and you may discontinue at any time. Your name, should you chose the option to provide it, will never be associated in any way with the research findings. Completion of the survey indicates your willingness to participate in this research and that you are 18 years or older.

Should you have any questions about this survey, whether before or during the course of completing the

questionnaire, please contact the survey administrator by phone or email. Thank you!

Demographic Questions

Institution size
- Fewer than 2 million volumes
- 2-3 million volumes
- 3-5 million volumes
- More than 5 million volumes

Institution type
- U.S. research library that is a member of ARL (Association of Research Libraries)
- U.S research library that is a member of the IRLA (Independent Research Libraries Association)
- Other U.S. institution: _____

Your job title: _____
What functions do you manage and/or participate in? (select all that apply)
- General collections book conservation/repair
- Special collections book conservation

What percentage of your position is dedicated to managing and/or participating in these activities?
- 75% or more
- 50-74%
- 25-49%
- Less than 25%

Which best describes your institution's conservation/repair facilities?
- Our sole facility serves the general collections
- Our sole facility serves the special collections
- Our sole facility serves both special and general collections (may contain spaces, equipment and/or staff dedicated to special or general collections)
- We have separate/distinct facilities for special and general collections
- Other: _____

How recently was your in house conservation/repair facility built or last significantly renovated?
- 2010s
- 2000s
- 1990s
- 1980s
- Pre-1980
- N/A

How did you acquire your conservation knowledge and skills? (select all that apply)
- Conservation apprenticeship
- Graduate degree/certificate in conservation
- Bookbinding program with conservation component
- Graduate degree in Library/Information Science
- On the job training and/or experience
- Workshops/training sessions
- Professional association meetings
- Self study (e.g., books, online resources)
- Other: _____

Where did you receive your degree/certificate in conservation?
- Columbia/University of Texas at Austin
- Cooperstown/Buffalo
- Delaware/Winterthur
- NYU/IFA
- Camberwell College of Arts
- West Dean College
- Sorbonne
- Other _____

Which bookbinding program did you graduate from?
- North Bennet Street School
- American Academy of Bookbinding
- Other _____

General/Special Collections Treatments

(While otherwise identical, these two sections applied to general and special collections treatments, respectively. For treatments whose names were not self-explanatory, definitions were provided below the treatment in the survey tool. For ease of reading in this article they have been separated into a list; see appendix B.)

Considering the past three years, indicate which techniques are performed in house for general collections treatment, using the following categories:

Standard practice, frequent—Part of your established toolbox of techniques, executed routinely or with some regularity (relative to overall production levels).

Standard practice, occasional—Part of your established toolbox of techniques, executed occasionally or rarely (relative to overall production levels).

Anomalous—Performed rarely and for exceptional reasons. Not considered standard practice.

Never—Not used (in the past three years)

Not sure—Uncertain as to what this (and/or whether I›ve used it in the past three years).

Protective Enclosures

	Standard practice, frequent	Standard practice, occasional	Anomalous use only	Never	Not sure
Polyester book jacket					
CoLibrì™ polyethylene book jacket					
Pocket, envelope, or 3 or 4-flap folder in a pamphlet binder					
3 or 4-flap card stock book wrapper ("tuxedo" or variant style)					
3 or 4-flap "phase" box (rivet & string closure)					
Corrugated board book box					
Cloth covered clamshell book box					
Providing custom sized book boxes purchased from a vendor					
Polyester sleeves and/ or encapsulation					

Binding Reinforcements

	Standard Practice, frequent	Standard practice, occasional	Anomalous use only	Never	Not sure
Pamphlet binding, adhesive attachment					
Pamphlet binding, stapled					
Pamphlet binding, sewn					

Minor Paper Treatments and Textblock Repairs

	Standard practice, frequent	Standard practice, occasional	Anomalous use only	Never	Not sure
Creating/inserting photocopy replacement pages					
Mending with "archival" tape e.g., Filmoplast, Archival Aids					
Mending with heat set tissue					
Mending with remoistenable/solvent-set tissue					
Mending with Japanese paper & paste					
Guarding sections with Japanese paper & paste					
Toning Japanese paper for mends and/or fills					
Re-sewing several sections					
(Re)sewing an entire volume					
Barrier spine lining of Japanese paper and paste					
New end sheets, tipped on					
New endsheets, hinged onto the spine with Japanese paper					
New end sheets, sewn on					
Adhesive binding					

Board Reattachment Methods

	Standard practice, frequent	Standard practice occasional	Anomalous use only	Never	Not sure
Joint tacketing					
Japanese paper board reattachment					
Toning Japanese paper with acrylics for board reattachment					
Solvent set tissue board reattachment					
Board slotting					
Partial cloth hinge					
New slips					

Rebinding Styles

	Standard practice, frequent	Standard practice, occasional	Anomalous use only	Never	Not sure
Recase					
New case					
Lapped case/Bradel binding					
New limp vellum and/or limp paper case binding					
Sewn boards binding					
Split board binding					
Treatment 305					
Double-fan adhesive binding					

Binding Repair Techniques

	Standard practice, frequent	Standard practice, occasional	Anomalous use only	Never	Not sure
Cloth reback					
Leather reback					
Japanese paper reback					
Reattaching detached spines with a hollow tube or v-hinge					
Lifting endsheets to save original pastedown endsheets					
Dyeing cloth with acrylics for binding repairs					
Dyeing leather with leather dye for binding repairs					
Consolidating leather with Klucel-G					

Advanced Paper Treatments Performed on Books/Bound Volumes

	Standard practice, frequent	Standard practice, occasional	Anomalous use only	Never	Not sure
Aqueous washing/ alkalization					
Bookkeeper deacidification (in-house)					
Tape/adhesive removal using heat					
Tape/adhesive/stain removal using water (e.g., methyl cellulose)					
Tape/adhesive/stain removal using other solvents					
Dry cleaning with vinyl erasers and/or vinyl eraser crumbs					

Other/Notes:_____

Conclusion

Would you be willing to participate in a brief follow up survey in a couple of months, if needed?

- Yes
- No

Your name:_____
Your email address:_____
Thank you! Your survey has been submitted. Thank you for your participation.

Appendix B: Treatment Names and Definitions

The survey included the following definitions for treatments whose names were deemed insufficiently self-explanatory. The definitions were listed below corresponding treatments in the survey tool but are listed separately here for clarity.

Treatment Name	Definition
Polyester book jacket	Non-adhesive custom-fitted book jacket made of clear polyester film (e.g., Mylar).
CoLibrì™ polyethylene book jacket	Machine-assisted method for fitting books with non-adhesive polyethylene book jackets.
Polyester sleeves and/or encapsulation	Encapsulating paper in polyester (e.g., Mylar) and/or using prefabricated polyester sleeves (where one or more edges may remain unsealed).
Mending with heat-set tissue	A thin, acrylic-coated tissue applied with a heated tool.
Joint tacketing	Board reattachment technique wherein thread is laced through holes piercing the book's shoulder and through corresponding holes in the boards.
Japanese paper board reattachment	Board reattachment technique wherein Japanese paper is adhered along the inner (and typically also the outer) joint.
Solvent-set tissue board reattachment	Variant Japanese paper board reattachment technique employing solvent-set tissue impregnated with an adhesive.
Board slotting	Board reattachment technique employing specialized equipment to create an angled slot in the edge of the board for a cloth spine lining hinge.
Partial cloth hinge	Board reattachment technique that minimizes spine disruption by employing limited sections of cloth spine linings/hinges, typically at the head and tail.
New slips	Using new thread (or cords or tapes) to extend sewing supports and create new board attachment slips at one or more sewing station.
Recase	Rebinding using the original case binding.
New case	Rebinding using a newly constructed case binding (may include retaining parts of the original cloth, such as onlaying the original spine title).
Lapped case/Bradel binding	Variant case binding in which the boards are attached to each other with cloth or paper, creating a "flexible spine inlay" prior to covering.
New limp vellum or limp paper case binding	Generally non-adhesive limp paper/parchment cover with a textblock typically sewn on supports that are laced into the cover.
Sewn boards binding	Early coptic adaptation in which the boards, typically folios of mat board, are sewn with the textblock. Cloth/paper coverings use minimal adhesive.
Split board binding	In-boards binding repair in which new boards are constructed as laminates, with the hinge and sewing supports sandwiched between layers of board.
Treatment 305	Tight joint repair in which new boards are attached with a cloth spine lining adhered to (and sometimes inset in) the outside of the boards. The covering may be dyed to approximate leather.
Cloth reback	Spine replacement using new cloth.
Leather reback	Spine replacement using new leather.
Japanese paper reback	Spine replacement using Japanese paper.
Aqueous washing/alkalization	Removing acidic products by bathing paper in water. Alkaline chemicals may be employed to deposit an alkaline reserve in the paper
Bookkeeper™ deacidification (in-house)	A commercial product sprayed onto paper to slow acidic degradation processes.

Creating Article-Level Discovery of Print-Only Foreign Language Journals

A Case Study of SALToC's Distributed Approach

Aruna P. Magier

Foreign language journals are important components of interdisciplinary area studies collections at research libraries. In the US, although these are low-use materials almost by definition, they are indispensable for many types of research. Coordinated collection development among key libraries with shared interests in these materials is often the best way of broadening the collective collection, strategically reducing duplication to free up resources for broader acquisitions while relying on collection sharing infrastructures to implement shared access to the journals.

Collection sharing requires bibliographic access. With journals, sharing is usually via interlibrary loan and electronic document delivery, which require *article-level* bibliographic access for formulating the citation for a request. The challenge in providing article-level discoverability of print-only foreign language journals is that they are generally not included in online indexing/abstracting services. A frequent alternative for article discovery of unindexed journals is physical browsing, but many libraries do not circulate bound journals or will not lend them via interlibrary loan (ILL). Even for the institution's own patrons, browsing is difficult because such low-use materials are typically sent to off-site storage. The ability to engage in cooperative collection development of low-use, print-only, foreign language journals is limited because of inadequate possibilities for article-level discovery, which are the prerequisites for collection sharing.

The South Asian Language Journals Cooperative Table of Contents (SALToC) project discussed in this paper addresses this issue by creating simple, online, centrally browsable, open access tables of contents for target journals via a low-cost, low-tech distributed process benefitting researchers at all libraries. SALToC also demonstrates the applicability of this approach for creating article-level discovery for any unindexed journals and is not limited to foreign language journals.

The SALToC model promotes research and leverages the value of otherwise undiscoverable library holdings. Many libraries provide scan-and-deliver services if the requester provides a citation. With the help of citations discovered

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through SALToC, scholars can thereby access articles from these otherwise inaccessible print journals through document delivery, ILL, off-site retrieval, and other fulfillment services for which libraries already have the infrastructure. Beyond this immediate benefit for discovery and access, the SALToC model provides the secondary benefit of making cooperative collection development supportable. The SALToC project represents a proof-of-concept demonstration of the value of this approach. This paper shows how simple, "grass-roots" distributed efforts can contribute significantly to discoverability of hard to access resources, thereby making cooperative collection development cost-effective, popular among users, and sustainable.

Background: the Context of Coordination in Collection Development

Many academic libraries have responded to tight budgets by cutting back on the collecting of more specialized, lower-use materials, hoping to rely more heavily on other libraries' collections to help fulfill their users' research needs for materials they no longer collect. This is particularly true in the humanities and area studies, as observed by Jakubs: "It is not surprising that the cooperative arrangement has worked well with area studies and less well with the sciences, given that scholars whose work relies on difficult-to-find resources are pleased to have them at all and are more willing to be dependent on a partner institution, while scientists have a more urgent need for the materials and expect them to be in the campus library." [1]

When groups of research libraries coordinate collection development, they can thereby strategically reduce unnecessary duplication, redirect resources to broaden the scope and research power of the community's aggregated shared collection, and increase the likelihood of being able to supply the materials that respond to their patron's needs on the whole.[2] But coordinated collection development by itself cannot produce these benefits: they are possible only when collection planning is implemented within an effective system of shared access to each other's collections. Cooperative collection development can be achieved by the intersection of coordinated collection development, resource sharing, and bibliographic access.[3]

The Need for Discovery

The ability of patrons to make effective use of library collections depends on discovery. In the absence of means of discovering the resources a library makes available, the patron cannot locate, request, retrieve, or use them. Discovery is a precondition for access. Conversely, lack of discovery translates into lack of use.[4]

In the context of cooperative collection development, lack of discovery limits a community of libraries' ability to share and borrow from each other. If parts of a library's collections are not exposed to discovery, they will not be used by the library's patrons and also cannot be shared with other libraries since patrons at partner institutions are unable to request them. From the patron's perspective, the main advantage of shared collections and access to them is only achieved when these resources are exposed for discovery. Within a system of collaborating libraries, the *value* of discovery is a function of the breadth of potential use it enables across the populations of the institutions engaging in resource sharing. Having made the investment in acquiring and maintaining collections, it is in a library's interest to leverage their value by providing discovery and access in the ecosystem of cooperative collection development.

Discovery Mechanisms and Cost-benefit Analysis

The value of discovery must be balanced with the costs. Discovery at various levels is provided through a variety of mechanisms, each with its own associated costs and benefits.[5] Libraries provide various kinds of discovery tools for different kinds of resources that require differing amounts and kinds of investment to enable discovery. An instance of a low-investment option is having a book or journal issue in open stacks, making its content theoretically discoverable via browsing. Many have written about the value of serendipitous discovery through browsing.[6] Conversely, full-text digital presentation of collections of content, with full-text indexing, multiple descriptors and added-value access points, thesauri, cross-referenced authority files, citation-linking, etc. exposed through an intuitive interface for searching and browsing, with facets for narrowing or broadening one's search, relevance-ranking of results, presentation of related materials, etc. make the units of content much more discoverable. The monetary and staffing costs associated with creating the metadata and mechanisms underlying that kind of discovery are much higher.

What is the appropriate level of investment to deploy along this continuum of discovery for a given universe of content? Whether from the publisher's perspective, aggregator's business plan, or from that of the library community's desire to leverage the value of its own holdings for its own patrons, such decisions are presumably made on the basis of anticipated use triggered by the discovery model. This means that potential use of any content is at least partly a function of the likelihood that patrons would use it if they could discover it. These kinds of cost-benefit calculations (better discovery means more usage, which means

either more profit [commercial business plan] or better service [library mission]) are clearly not infinitely scalable. For any content, usage will plateau at some level regardless of how much was invested in top-notch discovery. An idealized cost-benefit analysis for any content would also need to consider the theoretical level where usage would level off. Regarding the target content addressed in this paper (unindexed, print-only, South Asian language journals in US libraries), the most likely determinant of that plateau is language: the potential audience for the content cannot be larger than the number of people who can read the language, regardless of the quality of the discovery. Since that number in the US will be lower than the English-reading audience, it is safe to guess that the return on the discovery investment will plateau at a much lower point for these journals than for the much larger number of English-language journals these libraries hold. The "right" level of investment will likely be quite low for foreign language journals.

As described below, a group of South Asian studies librarians attempted to address the challenges of producing a much-needed quantum of article-level discovery for scholars of South Asian studies—at an appropriately low level of investment—by creating SALToC (see https://archive.nyu.edu/handle/2451/33560). As an open access, low-cost table of contents discovery mechanism for print-only journals in South Asian languages, SALToC is also an effective tool for these librarians to coordinate their collection development investments. The hypothesis is that this model represents an appropriate level of investment to produce a much-needed quantum of discovery for this content.

Foreign Language Periodicals in Research Libraries

Many countries publish a broad range of periodical and journal literature of importance for research in the languages of their regions. While the best of these are considered as an indispensable component of interdisciplinary area studies collections at US academic research libraries, they are often, by definition, low-use, "obscure" research materials. They frequently share the fate of other low-use materials, which is to be omitted from prospective collection development policies.[7] With libraries increasingly focusing on their "core" needs, usage data, patron-driven decision-making, etc., librarians with the mandate to ensure access to these kinds of resources for their area studies constituencies coordinate with their counterparts at other libraries. Through careful coordination, they can strategically reduce duplication regionally or nationally, and redeploy greatly needed resources. Depending on collection development philosophies and missions, these resources can be counted as bottom-line savings, redirected locally for other collecting priorities or used to target additional needed journals to round out the collective collection, relying on collection sharing infrastructures to implement shared access to the journals among the group.[8]

The challenge to this coordination is the general lack of discoverability of papers in the journals collected through such cooperative arrangements. If users cannot discover papers in these unindexed off-line journals (except via physical browsing), then how can cooperating libraries share them and distribute responsibility for collecting and retaining them? Answers to these questions are essential to coordinated collection development.

The rise of e-journals in general has facilitated vast increases in discovery at the article level. Before e-journals existed, libraries facilitated title-level discovery of journals through creation of a single bibliographic record with subject headings and access points. A library patron could discover a journal on a particular topic, but the only way to find individual *articles* was to physically browse the holdings or citations from other articles. Occasional printed author and subject indexes produced by a journal's publisher enhanced article-level discovery, later followed by third-party indexing and abstracting services that enabled article-level discovery across multiple journals. Usually, such bibliographic-only databases have been more recently supplanted or made redundant by the rise of full-text e-journals with publisher-level cross-journal article discovery through the publishers' or aggregators' interface, and integrated discovery systems across all those systems at the higher end of the discovery spectrum as previously described.[9]

Each improvement in article-level discovery along that continuum omitted some journals as discovery-providers deemed that content not worth the investment necessary to raise it to the current high-end. For the reasons outlined above, foreign-language journals in general are often the most overlooked in this process, particularly those that are not available as e-journals. Because of language, their potential for increased use seemed too low to warrant attention. When libraries have continued to collect and retain them for the inherent research value of their content (and to serve local research and teaching priorities), bibliographic access at the article level has generally continued to be possible only by physical browsing. While countries differ greatly in their level of technological development, ubiquity of internet access, and prevalence of online publishing, area studies librarians report that much of this kind of content is not available online and not indexed.[10]

This is largely the case with journals and periodicals in the languages of Africa, South Asia, Southeast Asia, much of Eastern Europe and Central Asia, the Caribbean, and even parts of Latin America. Whereas Troost reports that there is broad online accessibility of Chinese and Korean

journals (and well-indexed discovery for those in Japanese), this is not the case for journals from other parts of Asia.[11] A 2018 study commissioned by Ithaka S+R entitled "Supporting the Changing Research Practices of Asian Studies Scholars" notes that

> Asian studies scholars struggle to discover relevant information and to keep up with the deluge of publications. Differing publication conventions and categorization systems in Asia can make it difficult for scholars to employ the same discovery methods as they do with Western publications…. One of [the] challenges is that rates of digitization and the ability to access digital materials varies widely within and among regions of Asia. For instance, scholars researching in East Asia generally found that Korean institutes "scan a lot and they put up a lot [of] stuff online, so it's just really accessible," whereas in Japan and Taiwan, remote access to databases and other digitized government documents is only available to citizens of those countries, if not only in-person. In other regions, such as in South Asia, "there's not a lot of stuff online" despite increased digitization.[12]

With regard to South Asia, Rader observes, "A number of factors might have determined the dearth of discoverability of periodical literature from South Asia—a lack of broad commercial profitability, a complicated colonial/post-colonial relationship with English, lagging technology to effectively display and search materials in non-roman scripts. This glaring gap in easy discoverability however should not be equated with an absence of content of interest for writers and researchers."[13]

Because this content is in foreign languages, its usage is much lower than that of journals in English or other commonly taught languages. Those students and scholars who can read those languages, and whose research would benefit from access to these articles, tend to not use them because discovery is difficult compared to our growing expectations of keyword searching or "click-and-read."

How do Libraries Treat Low-usage Print Journals?

Not surprisingly, due to the high costs of maintaining print collections, libraries respond to low usage by moving these print journal runs to compact, off-site locations for retrieval on request.[14] In some libraries, if the constituency for the content is complacent, the library may simply cancel their subscriptions to these journals or deaccession the existing backfiles to save space. But for an unindexed print-only journal, moving the holdings to remote storage enacts a self-fulfilling prophecy of zero usage.[15] Held off-site where they cannot be browsed, no one will discover articles in these journals, no one will use them, and a history of non-usage will inevitably lead to deaccessioning to save on the storage costs.

Approaches to the Problem

Clearly, since research libraries continue to collect them for their research value, omitting foreign language print-only journals from the trend towards better article-level discovery is a problem. Many approaches to address this problem have been attempted. For example, working with the professional organizations of area studies librarians such as CONSALD's (Committee on South Asia Libraries & Documentation) Journals Subcommittee, JSTOR has sought to identify print journals from abroad that are priorities for negotiation with publishers to get their runs digitized and included in JSTOR. JSTOR's coverage of foreign journals from places like South Asia with vast print-only publishing enterprises has thus been growing gradually in recent years. However, the growth has only been in English-language journals (the largest language of publishing in South Asia and many other parts of the world).

Approaches from Scholarly Societies

One might anticipate that specialized scholarly societies, representing constituencies with a great stake in discovery and access to these materials, would make the necessary investment to start filling that gap. An example is the Association for Asian Studies (AAS)—an international scholarly professional association of over 7,000 members—to serve the interdisciplinary needs of broad Asian Studies research.[16] Among its activities in support of this field, AAS has a broad publishing agenda, including the premier bibliographic reference tool for Asian Studies—the *Bibliography of Asian Studies* (*BAS*).[17] The *BAS* was produced as an annual print index from 1936 through 1990. With a grant from the Mellon Foundation, the *BAS* was transitioned to its current incarnation as a cumulative online database with nearly a million records, originally hosted at the University of Michigan (UM).[18] To support production and administrative costs and the salaries of paid indexers, AAS charged institutional and individual subscription rates. Nonetheless, the costs and complexities of its production, and the challenges of updating the database's infrastructure and capabilities, could not be indefinitely sustained within the original online framework of informal academic institutional agreements at UM.[19] In 2016, AAS decided to transfer the *BAS*'s infrastructure and hosting to EBSCO

while retaining in-house editorial control. The *BAS* is now distributed commercially among EBSCO's other database offerings.[20] The *BAS* is a vast index of journal articles and book chapters from and about Asia, and is most noteworthy for its coverage of material from Asia that is not discoverable through other sources. For article discovery, nothing compares with its scope, but, as with JSTOR, the foreign language journals are again omitted: the *BAS* describes itself as "the single most important record of research and scholarly literature on East, Southeast, and South Asia written in Western languages."[21] Journals in the languages of Asia are not included.

The *American Bibliography of Slavic and East European Studies* (*ABSEES*) is another example of bibliographic production by a scholarly association: it was originally published as an annual printed volume from 1956 through 1994 and later switched to electronic only. It was produced under the auspices of the former American Association for the Advancement of Slavic Studies (AAASS) and supported by grants from various funders.[22] Like the *BAS*, *ABSEES* started as a production of a scholarly society, hosted within a variety of academic settings, including the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign. The cost of production, development, and hosting this resource became too high for local investment at the library (though most of its more than 135,000 records are from English sources, mostly published in the US and Canada), and the product was therefore converted to a commercially distributed database provided by EBSCO.[23]

What can be seen from the *BAS* and *ABSEES'* trajectories is that the limited resources available to scholarly society publishers dictate that even within the scope of specialized area studies, they must focus their efforts on activities that will benefit the largest potential population of their constituents: academic readers of English and other Western languages. Though not themselves geared for profit in the manner of commercial publishers and aggregators, these scholarly societies make choices about coverage (and eventually about moving hosting to a commercial provider) by the same kinds of logic of return on investment, which will tend to yield the same result for foreign language journals: the latter do not seem to warrant much (if any) investment.

Approaches from the Library Community

If commercial and non-commercial providers and scholarly societies are not likely to invest in creating article-level discovery of foreign language print journals, who will? While many will agree that these may be important for research, and that certain kinds of research simply could not take place without them, who has the motivation and resources to prioritize serving this potential constituency by creating a framework to enable their discovery? The answer would seem to point to the research library community itself, where the mission of connecting scholars to the content they need has always entailed making investments in enabling discovery (e.g., through original cataloging) of more obscure, low-use materials in their research collections.

Over the last few decades, libraries have experimented with numerous approaches to the problem with regard to foreign language journals. These have included local projects where individual libraries provided scanned tables of contents for some off-site materials on their websites and retrieval-request interfaces.[24] There are also single institution, open access projects like the South Asian Periodicals Index (SAPI) from University of Wisconsin Madison Libraries.[25] A variety of collaborative ventures have been attempted, including:

- the Latin American Periodicals Tables of Contents (LAPTOC) project hosted at Vanderbilt University;[26]
- the former Southeast Asian Serials Index (SASI) hosted at Australian National University;[27] and
- the Thai Journal Index project hosted at University of Washington.[28]

What these efforts have in common is that, for a universe of foreign language journals, they seek to recreate the same kind of indexing and abstracting functionality towards the high-end of the discovery continuum described above. They create individual records at the article level, deploy metadata fields to the extent that their production model and human resources allow, and present the records with some level of indexing and a search or browse interface for discovery of the articles.

But beyond the infrastructure costs of hosting and maintaining such databases, the work of creating article-by-article metadata is expensive, especially when considering the need for the language expertise and skills to accomplish indexing or cataloging. Even within distributed production models like LAPTOC where the work of contributing records from nearly a thousand journals published in twenty-nine countries is distributed between dozens of participating libraries, the size of the investment has created severe limits on the extent of coverage or on the sustainability of these projects.

Thus, for example, the SAPI project, supported by University of Wisconsin, indexed six South Asian journals, only two of which are non-English. After creating nearly a thousand detailed indexing and abstracting records for these two South Asian language journals in a distinct, tailored open access infrastructure, the project was decommissioned in the summer of 2018. The LAPTOC project, now collaboratively supported by LARRP (the Latin Americanist

Research Resources Project consortium based at CRL), produced a more impressive, searchable, open access database of more than 340,000 article-level records.[29] It unfortunately could not garner resources sufficient to sustain it after fifteen years of coverage (1994 to 2009).

The Thai Journal Indexing Project was organized by the Committee on Research Materials on South East Asia (CORMOSEA) member libraries and others and supported for two years by grants from the Association of Research Libraries (ARL) under the AAU/ARL Global Resources Project.[30] This Thai project deploys a unique combination of hand-crafted indexing and abstracting metadata with page images of the first page of each article to enable snippet-type browsing of the full text. It covers six Thai language journals but seems to have gone dormant following the conclusion of its grant funding in 1998. For now, the resources provided by most of these projects are still available on the web, each hosted in its particular structure and institutional setting or archived in the Internet Archive, but without any new investment in content or updating of the database or its functionalities.

The SASI was an open access index of about 77,000 records for articles from or about South East Asia derived from very selective coverage of about 140 journals. The records were created or contributed by the Australian National University (ANU) Library, Monash University's Asia Institute, and the Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV). The records consisted of article titles, sometimes with keywords, presented in a searchable database hosted by ANU. The Southeast Asian language content consisted of records created in the 1990s under a now defunct Indonesian Serials Database plus records from a small number of journals indexed by the KITLV.[31]

The challenges faced by all these models include the unsustainably high cost of creating the records and the informal or potentially unstable commitment to maintain the infrastructure for one-off, "niche" products like these on the part of the hosting institutions or consortia. Local stakeholders move on, institutional memories fade, and local IT resources to support or update those dormant or "legacy" projects get deployed for other priorities. These challenges have necessitated trade-offs such as aiming for slender coverage, minimal metadata, or scaling back or terminating projects once the initial funding is gone.

The Hispanic American Periodical Index (HAPI) has taken a different approach. HAPI, originally a print bibliography from the 1970s, is now an online database with more than 335,000 citations (about a fifty-fifty mix of online and print-only content) to articles in more than 700 journals (with about 400 journals being indexed currently, of which about 80 percent have links to full text).[32] The citations are full-fledged bibliographic entries, with subjects, added descriptors, and links to online full text where available (e.g. for the open access journals). The search interface is sophisticated, with many advanced features for searching, sorting, limiting and exporting result sets. The work of creating the records is essentially crowd-sourced among about thirty volunteer librarians and scholars at US universities and a few Latin American countries. The database has been hosted and maintained by the University of California Los Angeles' Latin American Institute. The trade-off that has enabled this project to remain operational is that it is not an open access production: while institutions in Latin America and the Caribbean receive free subscriptions, other institutions pay for subscriptions at tiered rates tied to student FTE levels.[33] The potential academic audience for Spanish-language journals is undoubtedly much higher than that for Thai, Punjabi, Hindi, Vietnamese, etc., and this cost-recovery model of paid subscriptions to cover hosting costs, combined with crowd-sourced production of metadata, might therefore be sustainable. However, there is some indication that even under this kind of cost-recovery model there is concern regarding HAPI's long-term sustainability.[34]

In an era when even large research libraries that are collaborating are challenged with securing or retaining the necessary human resources to provide original cataloging of their own backlogs of books and journals, how likely is it to sustainably prioritize the indexing or abstracting of the vast number of individual *articles* in all those demonstrably low-use, specialized foreign language journals? With notable exceptions like HAPI, such collaborative attempts generally have been spotty, limited in scope, and/or hard to sustain. The cost-benefit analysis for true indexing and abstracting of these inherently low-use materials tends to make such efforts hard to justify.[35]

SALToC as a Discovery Mechanism: Case Study

What follows is a case study of a very different, experimental, library-based collaborative approach undertaken by a group of South Asian Studies librarians targeting a select subset of print-only journals in languages of South Asia. The South Asian Languages Cooperative Tables of Contents (SALToC) project was specifically designed to be sustainable by avoiding the pitfalls of the kinds of projects outlined above, by not aiming for true indexing or abstracting, deploying instead a very low-tech, low-investment, distributed online project to enable open access article-level discovery towards the low end of the discovery continuum with no required new back-end or interface programming. SALToC enables discovery by online *browsing* of tables of contents, which is certainly incrementally better than no

discovery, and provides valuable benefits for access and cost-efficiencies for coordinated collection development.

A distributed low-cost system of creating simple, centrally browsable tables of contents in a sustainably accessible infrastructure with low-institutional barriers can facilitate research by enabling scholars to locate previously undiscoverable journal holdings. Exposing article citations for discovery in this way makes it possible for scholars to place ILL requests, document delivery requests, and offsite retrieval requests with full citations for the desired articles. While many libraries do not lend print journals, many do offer article-level document delivery on request, but only if the requesting institution provides a full citation.[36]

SALToC's "grass-roots" distributed type of approach offers a proof-of-concept demonstration that the goals of coordinated collection development (jointly planned reduction of unnecessary duplication and enrichment of the collective collection) can be enabled even for specialized, low-use foreign language print journals through cost-effective shared access via a low-lying discovery layer. How it works, the values it provides, and its potential weaknesses follow.

SALToC's History and Goals

Collecting from South Asia has a long history at many US research libraries. Although efforts at inter-institutional collaboration started earlier, the 1962 advent of the cooperative acquisitions program of the Library of Congress (LC) in India (initially subsidized with rupees from the US PL480 program) enabled a broader range of US libraries both to expand their collection coverage from the region and to begin exploring methods for coordinating their profiles.[37] This was possible because most of these libraries were acquiring books and journals from the LC program via a single profile structure. National efforts at South Asia collection coordination—with varying degrees of success—became more visible after a 1974 Boston Conference on South Asian Library Resources in North America, organized under the South Asia Council of the Association for Asian Studies, which highlighted gaps in the national collection from the region.[38]

CONSALD has been operating and expanding continuously since the 1960s. It functions as the professional library organization of South Asian Studies specialist librarians in collection development and technical services roles from all the North American research libraries supporting interdisciplinary South Asian Studies. CONSALD membership currently numbers about fifty.[39] Meetings, projects, and collaborations address a wide range of issues particularly relating to collection development, access, preservation, and retention of materials from South Asia.

In March 2013, in recognition of the particular problems related to coverage of South Asian journals in US library holdings, and the article-level discovery and access issues outlined above, CONSALD created a Journals Subcommittee. To improve full-text access to journals from the region, this subcommittee worked with JSTOR to successfully advocate for inclusion of a wider selection of English-language South Asian journals in the JSTOR database. The Subcommittee also receives regular reports on South Asian coverage in the *BAS*. Although JSTOR and the *BAS* provide extremely valuable, broad access to articles on the region, their coverage remains limited to English and other western-language sources. A recent study of Asian Studies scholars' research practices concluded that while "many Asian studies scholars expressed that they are not particularly challenged in their ability to access information published in the U.S.," scholars "experience difficulty discovering materials published outside of the West, often having to travel and spend significant amounts of time browsing through libraries, archives, and bookstores to discover information relevant to their research."[40] The issues of technology shortfall for providing discovery and access to non-Roman-script materials (such as lack of optical character recognition capabilities for these scripts) are also highlighted in this report.

To address some of this discovery shortfall, CONSALD's Journals Subcommittee began in 2013 to explore the possibility of creating their own non-commercial project to enable browsing of tables of contents of South Asian language journals. A formal proposal was presented at the October 17, 2013 CONSALD meeting.[41] This quickly led to a refined set of goals, operating criteria, and methodologies for the joint project, thereafter dubbed SALToC. SALToC's main goal that emerged from these deliberations was enabling article-level discovery of vernacular language journals from CONSALD collections identified as not otherwise discoverable because they are not online and not included in existing full-text or bibliographic databases. Key objectives included:

- allowing patrons to identify and access articles in their own collections or request them from other libraries through standard ILL;
- enabling patrons to cite articles in their research and to use the citations to request journal articles from offsite storage;
- making it possible for cooperating libraries to provide digital document delivery ("scan and deliver" or "photocopy and deliver" services) for articles in these vernacular journals, just as they already are providing for print journals in English;
- providing an online substitute for physical browsing; and
- allowing libraries to select runs of journals for removal to offsite storage without sacrificing some level of discovery and bibliographic access.

To highlight the contrast with other, more expensive discovery systems developed for more mainstream materials, this group clarified what it did not want SALToC to be. This was necessary to control expectations and to keep the project "low to the ground," to reduce the costs of creating discovery, and thereby improve the return on investment. SALToC is:

- not a journal article indexing project;
- not an indexing and abstracting service;
- not a searchable, structured database of citations; and
- not a table of contents alert service.

Because these South Asian studies librarians lack significant project resources from their libraries at their disposal, they narrowed SALToC's planning parameters to keep it as low-tech and low-cost as possible while still providing real discovery value.

SALToC Project Methodology

In keeping with these principles, SALToC was given a simple workflow requiring only modest investment of human resources from each participating library. The steps are simple, and do not require any special skills or highly trained staff, at each stage of the process. The central infrastructure for accumulating the distributed TOC content and placing it online in a sustainable open access archive was established by the South Asia Librarian at New York University (NYU). SALToC went live in early 2015. The workflow steps follow:

- Student assistants do not need to know the relevant languages and are quickly trained at each participating institution. They make simple, page-image PDF files by scanning the TOCs of each issue of the target journals contributed by their institution. A separate TOC file is created for each issue of the journal.
- The PDF files are annotated with two basic Roman-script bibliographic fields transcribed from the journal's local existing bibliographic record (title and imprint), and a field derived from the local volume holdings (or bound-volume spine labels): volume, issue number, date. The annotation also includes the journal's OCLC accession number.
- The annotated PDFs are transmitted to the central SALToC repository at NYU where the files are ingested as part of the university's institutional repository ("Faculty Digital Archive") maintained on the university's DSpace platform with a separate permanent URI for each journal's "landing page," which also displays links to its accumulating run of TOCs (PDF bitstreams), and acknowledgement of the contributing library. See http://hdl.handle.net/2451/33893 for an example of a typical SALToC journal landing page.
- An access link to the permanent URI for each journal's landing page is added to the bibliographic record for that journal in the contributing library's OPAC or integrated discovery layer to enable discovery of the TOCs by local users.
- Under the auspices of the Cooperative Serials Cataloging Program (CONSER), authorized NYU catalogers update the OCLC record for each SALToC journal, adding the same link to the journal's SALToC landing page (to enable discovery of the TOCs by others). See http://www.worldcat.org/oclc/214908417 for an example of a WorldCat record with the SALToC access link for ToCs.
- A simple DSpace "collection" page for the entire SALToC project, continually updated to list and link all the journals included, is also maintained in NYU's repository to enable participating librarians to promote and highlight SALToC to their patrons through LibGuides, bibliographic instruction, etc. beyond the linkage for each title provided through OPACs and WorldCat. The SALToC collection page is available at https://archive.nyu.edu/handle/2451/33560. Since the SALToC site is crawled and indexed by Google, the project site and each of its journal titles are also discoverable through general internet searching.

The contributing institutions' workflow for scanning the issues is thus light, and the brief metadata for the annotations is a matter of transcribing available bibliographic and enumeration/chronology information. Unlike indexes and other searchable databases that require subjects and descriptors, SALToC does not require description, cataloging, or metadata creation because that work has been done in local catalogs and OCLC at the journal-title level. The selection of titles for SALToC is determined by consensus among the CONSALD Journals Subcommittee and the contributing libraries, and no library assumes more of this workflow than its staffing can easily absorb.[42]

The workflow at NYU's central file repository is likewise light. After the initial 2015 development of the SALToC template by NYU Libraries Digital Library Technical Services staff within the DSpace repository platform, the ingest of the contributed PDF files is straightforward, with an interface that supports manual ingest by students (who do not need to know the relevant languages) or batch-ingest of files organized by simple file-naming conventions (e.g., Astha_01.01.pdf, Astha_01.02.pdf, etc.). The task of adding the enumeration/chronology labels for the link to each bitstream file involves only copying the enumeration/

chronology field from each PDF file's internal annotation and pasting it into the bitstream description label. With that infrastructure and standardized workflow in place, adding TOCs for the existing titles is very straightforward. When new titles are added to the SALToC project page, NYU's SALToC Project Editor edits the DSpace collection page to add a link the new landing page and informs the CONSER-authorized cataloger to update the OCLC record to include the new URI link to the title's landing page into the OCLC record's 856 field.[43]

Beyond local decisions regarding staff capacity for scanning and contributing TOCs, SALToC group considerations for coverage and prioritization include issues of language (for example, focusing on widely collected versus "overlooked" South Asian languages), discovery correlated to existing access and delivery mechanisms, and subject scope as related to coordinated collection development among the group. Two years of detailed discussions have resulted in flexible parameters. Individual participating institutions could contribute journals according to local priorities determined by their South Asia librarian and input from relevant scholars. The general consensus was to focus on annuals, bi-annuals, or quarterlies with more complete holdings, though monthlies are occasionally included. Many SALToC titles have their runs completed by coordinated contributions from multiple participating libraries. The subject selection of serials for SALToC coverage focuses on history and humanities, literature, and social sciences. As of this writing, SALToC consists of twenty-six titles, plus 1,545 files in eleven languages, supplied by twelve partners.[44] A thirteenth partner, NYU Library, contributes the hosting services and institutional repository infrastructure described above.

SALToC Within the Context of Cooperative Collection Development and Distributed Print Archiving Commitments

Beginning in 2010, South Asian Studies librarians, including many CONSALD members, organized a collective referred to as SACOOP (South Asian Cooperation).[45] SACOOP held annual workshops to offer consensus methodologies to address specific aspects of cooperative collection development.[46] The 2010 workshop focused on rationalizing these libraries' South Asia monograph profiles in their participation in the South Asia Cooperative Acquisitions Program (SACAP) of LC's New Delhi field office to begin to orchestrate a well-rounded national collection.[47]

In 2011, this group's attention turned to considering collaborative approaches to South Asian serials. The Fall 2011 SACOOP Workshop focused on highly subscribed and least-subscribed journal titles acquired through LC's New Delhi-based SACAP with the goal of shifting resources to broaden the collective collection and fill in gaps in the national coverage of the journals using detailed subscription and holdings analyses contained in a 2010 working paper by Wright.[48] Simultaneously, the group recognized that the coordination of collecting required appropriate discovery and access, as reported in its 2011 workshop report:

> It was agreed that institutions should better coordinate serials subscriptions on a national level. That said, if cooperation determines that access is not to be local, proximate and reliable access to the literature is critical. Libraries must lobby for better indexing and discovery tools—or to create them ourselves—so that discovery leading to successful interlibrary loan is actually feasible.… Participants expressed strong interest in extending the availability and discovery of indexing for top journals to allow institutions to more comfortably relinquish physical access to local copies.[49]

These deliberations eventually led to the concerted effort to create at a minimum browsing discoverability for articles in the least accessible South Asian journals—those in South Asian languages produced only in print. From this endeavor, SALToC was born.

With the gradual coordinated shifts of subscription resources for these journals, and with the successful launch of SALToC to begin to provide the discovery necessary for ILL and physical access, in 2006, the SACOOP group heeded the need for explicit print-retention commitments for assured future access to materials collected under cooperative agreements.[50] A working group was created, charged with exploring methods and terms for print retention agreements, and for an envisioned SACOOP distributed print archive in particular. With the goal of identifying and prioritizing the South Asian materials to be targeted for print retention commitments, a SACOOP Print Retention Content Group was also created. This working group's ideas and general recommendations were discussed and endorsed at the fall 2017 SACOOP Workshop.[51]

The purpose of commitments to print retention include simply ensuring continued access to the targeted material for the holding institution and providing some level of assurance to other libraries that the material will continue to exist in the holding library. The other libraries may have a "stake" in the target material, either in terms of: (1) an expanded universe of content to which the patrons of non-holding libraries could have theoretical access or (2) another holding library's ability to deaccession their holdings of the target material (e.g., to save money or space) without completely losing access to the targeted content.

This is explained in the Content Working Group's core principles.[52]

Priorities for retention commitment could be keyed to judgment of the relative size of the "stake" that the collective community of libraries and scholars has in that material. That is, the larger the stake in a given set of material (for SACOOP or the whole community of libraries and scholars), the more important it will be to target that material for retention commitment. Of the two stake elements above, (1) should be a given a higher weight because all will have a stake in material that uniquely enriches the total universe of valuable research content in libraries, and its value depends upon its committed retention. But stake element (2), while theoretically enabling some set of specific holding libraries to save money and space by deaccessioning their copies of the target material (on the basis of the committed retention by one library), will produce a much narrower benefit (only for those libraries, not for the universe of scholars from all libraries). Element (2) should be given a lower weight than (1) in targeting materials for retention. Everyone benefits from a library committing its holdings of important research materials, but when a library withdraws duplicated copies it only benefits itself.

Another set of considerations that impact the evaluation of the stake of a given set of material are the conditions of access. For example, the community as whole has a much smaller stake in the retention commitments of material retained in a library that will not lend it than the same material in a library that circulates it. The general principle is that the terms of the stake vary according to the degree of access (including discovery) provided by the holding library.[53]

With these principles in mind, consensus emerged in 2017 among the SACOOP members with the idea of interlinking the creation of article-level discovery of South Asian language periodicals through SALToC with the targeting of specific titles for retention commitment. Implementation of explicit institutional commitments along these lines is not at the sole discretion of the South Asian Studies librarians themselves, and so it progresses incrementally according to the general frameworks and infrastructures for retention commitment available at each library. Commenting on the need for libraries to commit to new ways of sharing, Rader wrote, "Access to content is critical for success in all research areas. As we respond to changes in the North American research library environment—reduced budgets, for sure, but also increased opportunities to rely upon each other through deep collaboration—we are called to build and deploy new inter-institutional structures to ensure the ongoing discovery, access, and use of materials. The interconnected relationships of SACOOP and SALToC epitomize what is possible when we work together for a common good."[54]

Conclusion

Nothing about SALToC is radical or entirely new. Considered in the aggregate, SALToC model's features represent a more intentional effort to locate an appropriate value point between the ideal and the real. Recognizing that article-level discovery is a matter of degree, and that for specialized, low-use research materials like these, discovery mechanisms at the high-end of the continuum (the ideal) would require high levels of investment that would skew the cost-benefit ratio and make the whole enterprise unsustainable in institutional contexts of constricted resources, SALToC aimed instead for something much more modest, and of incremental discovery value, that could be sustained and scaled because it is unlikely to be cut.

How sustainable is SALToC? The SALToC model avoids the pitfall of relying upon purpose-built or one-off structures with potentially impermanent locations on the web. It was designed to ensure that the catalogers' one-time-per-journal investment of work to add TOC links into OPAC and WorldCat records would not need to be updated or later revised.[55] Catalog links to open web content are ephemeral and tend to become outdated and quickly become dead-end links.[56] SALToC's approach reassured catalogers that they were linking to permanent content at a permanent address. SALToC achieves overall sustainability in several ways:

- it uses a light-weight, low-tech, maintainable infrastructure;
- it requires minimal resource investment of human workload and system resources; and
- it provides demonstrable discovery value for researchers, through targeted *browsing* of tables of contents.

The collaborating South Asian Studies librarians who devised SALToC created what is undeniably a niche product (that fills a specific need not otherwise filled for South Asia vernacular journals), but not based on a separate niche infrastructure. Housing SALToC in NYU's DSpace institutional repository required no specialized programming, workflow, database, or server maintenance. It uses an existing system and maintained to do what the University is already committed to doing: providing a repository built for faculty, with long-term institutional commitment for permanence and permanent URIs. SALToC thereby leverages the value of that existing infrastructure without additional cost.

How scalable is the SALToC model? What are the potential limits on its growth? SALToC is scalable because contributor institutions add as much or as little as they want. As of this writing, SALToC grows at an average rate of about 500 TOC files per year. The barriers to entry are

exceedingly low, and so far, three years into the experiment, the decisions about making these minor investments have been kept very close to the "grass roots" level (i.e., the front-line area studies librarians who work most closely with the scholars who benefit from SALToC). Each contribution (TOC) adds incremental value to SALToC, creating permanent discoverability for the corresponding articles in the libraries' print holdings, via the links in the OPACs and in WorldCat records. With this infrastructure in place, the work to insert each successive contribution is negligible: it is completed in minutes by non-specialist staff and students.

SALToC therefore seems to be both sustainable and scalable. In contrast, projects that have attempted to create discovery at higher points on the continuum, for example by creating searchable, structured databases of full article citations (like LAPTOC and the University of Wisconsin's South Asian Periodicals Index) require actual data-entry for each article at participating institutions. This dramatically increases the cost of production, making the project less sustainable or scalable. Learning from projects such as LAPTOC and SAPI, SALToC participants chose to meet the needs of discovery through browsing: page images, with no data-entry and no language skills required. Expanding the channels of discovery by embedding title-level SALToC TOC links into the individual full catalog records in WorldCat provides the added value of enabling users to find wanted articles and to simultaneously see which libraries have the relevant holdings.

For low-use material like these South Asian language print journals, it is still too soon to conduct a full-scale evaluation and accounting of fully loaded costs and derived values, costs-per-use, research impact factors, user experience, etc. Some have compared SALToC to other resources with which they are familiar (for example JSTOR). It clearly seems home-grown and improvised, it lacks features available with high-end productions, and it lacks a search box. However, SALToC is also generating enthusiastic reports of use-cases on how it is enabling scholars to delve into the journal content these libraries are collecting for them across the cooperating institutions in ways that seem to validate the premise of coordinated collection development.

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53. The effectiveness of formal print retention commitments in empowering cooperative collection development among library communities, as well as in local decision-making, critically depends upon registering and disclosing those commitments to all concerned, and even making those disclosures available for macro analysis. This is an explicit principle and requirement in the HathiTrust Shared Print Program for monographs. See, for example, the Disclosure section and the discussion of the HathiTrust Shared Print Registry in *HathiTrust Shared Print Program Operating Policies and Guidelines, June 2017 [revised May 2018]*, accessed July 8, 2018, http://www.hathitrust.org/sites/www.hathitrust.org/files/HathiTrust%20Shared%20Print%20Policies%202018%2005%20rev.pdf. It is also central to the June 2018 announcement of the Mellon Foundation's grant to OCLC and the Center for Research Libraries "to enhance the underlying infrastructure of the OCLC WorldCat database and CRL's Print Archives Preservation Registry (PAPR) to accommodate and make accessible actionable data for shared print serials management." *OCLC Awarded Mellon Foundation Grant to Register Library Retention Commitments for Print Serials in WorldCat*, accessed July 8, 2018, http://www.oclc.org/en/news/releases/2018/20180624-oclc-awarded-mellon-foundation-grant.html. While SACOOP discloses its serial retention plans to its own members in its workshop and reports outcomes documentation, it will probably have to work with each member institution to ensure that any formal, MoU-based commitments do get centrally registered in PAPR to be of maximal value to non-SACOOP members as well.
54. Mary Rader, personal communication, July 6, 2018.
55. This operation takes less than five minutes per title, according to Joyce Bell (Cataloging and Metadata Services Director, Princeton University Library), personal communication, November 2015.
56. There is a vast literature on the notorious instability of URLs and citations to web-based content. See, for example, a foundational study by Wallace Koehler, "A Longitudinal Study of Web Pages Continued: A Consideration of Document Persistence," *Information Research* 9, no. 2 (2004), accessed July 8, 2018, http://www.informationr.net/ir/9-2/paper174.html, which monitored a sampling of web pages between 1996 and

2003 and found that they had a half-life of only two years (i.e., on average 50 percent of webpages disappear within two years).Faith Oguz and Wallace Koehler, "URL Decay at Year 20: A Research Note," *Journal of the Association for Information Science & Technology*, 67, no. 2 (2016): 477–79. With the reduction in barriers to self-publishing on the web, and the ubiquity of internet access world-wide, the average half-life of web content has presumably grown even shorter since then.

Resource Description and Access Adoption and Implementation in Public Libraries in the United States

Roman S. Panchyshyn, Frank P. Lambert, and Sevim McCutcheon

This study surveyed the current state of knowledge about, and application or use of, Resource Description and Access (RDA) among American public library catalogers. In 2017, an online survey request was e-mailed to four thousand libraries for the person or persons most responsible for cataloging to complete the questionnaire. More than three hundred libraries responded. The data expose serious concerns with RDA adoption within the public library sector. While a majority of catalogers know about RDA, their working knowledge about it differs substantially depending on whether they work in rural or urban library settings. Regardless, 22 percent of respondants still had not heard of the RDA standard until completing this survey. While further training and educational opportunities (along with funds) for catalogers nationwide would help minimize this disparity, LIS schools also can play a role by educating more thoroughly the next generations of catalogers in this newer descriptive standard. Coming on the brink of a shift in the theoretical framework of the RDA standard, from the Functional Requirements for Bibliographic Records (FRBR) model to the IFLA Library Reference Model (LRM), public library catalogers risk falling even farther behind in their knowledge and competency with the RDA standard.

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In 2013, a paradigm shift occurred in the cataloging landscape. After extensive testing and review, Resource Description and Access (RDA) was adopted by the three US national libraries (Library of Congress (LC), the National Library of Medicine (NLM), and the National Agricultural Library (NAL)). Other major research libraries, both in the United States and internationally, followed suit. RDA replaced the Anglo-American Cataloguing Rules 2nd Edition (AACR2) published in 1978 and implemented in 1981.[1] In anticipation of the switch, many libraries began preparing their staff for RDA implementation by reviewing available training options. This paper focuses on RDA preparation and adoption in public libraries in the United States.

Lambert, Panchyshyn, and McCutcheon conducted a pilot study on RDA adoption and implementation in 2013 by public libraries in Ohio. They published their findings in a research paper titled "Resource Description and Access and Ohio Public Libraries."[2] The study examined the preparedness and education of public library cataloging staff regarding RDA training and implementation in

Ohio public libraries. The authors attempted to determine to what extent public library catalogers were receiving the training necessary for successful adoption of RDA. The study noted regional variations among public library staff regarding their extent and exposure to RDA training. It identified regional variations in the level of training needed by public library catalogers, with the greatest need for training occurring among libraries with funding and budget constraints. Additionally, it supported the view that Ohio's public library catalogers lacked the same level of training and comprehension of the RDA standard as academic librarians, especially concerning RDA's theoretical FRBR structure.[3]

By 2017, RDA was implemented by a majority of the major US research and academic libraries. Since the library profession has had time to consider the implications of adopting and implementing RDA, the authors wanted to examine how RDA adoption and training has filtered down to catalogers working in public libraries across the US during this period. Public library catalogers are underrepresented in the library literature, and the 2013 study hinted that their level of education and training was a significant factor in RDA adoption. Their catalog users also were impacted by RDA adoption because the use of RDA data by integrated library systems and discovery layers has changed how they view and use cataloging data.

A significant change to the theoretical framework of the RDA standard is on the horizon. The conceptual models developed by the International Federation of Libraries Associations and Institutions (IFLA), Functional Requirements for Bibliographic Records (FRBR), Functional Requirements for Authority Data (FRAD), and Functional Requirements for Subject Authority Data (FRSAD) will be consolidated and replaced with the Library Reference Model (LRM).[4] Implementation is planned for summer 2018. While this change may lack the dramatic impact of RDA adoption in 2013, catalogers, both academic and public, will need to understand this new theoretical framework because it will have an impact on their use of the standard.

Purpose Statement

The purpose of this current study is to determine to what extent RDA adoption and training is filtering down to catalogers in public libraries on a national scale. Using survey methodology, questions posed to participants focused on collecting data on variables such as geographic location, educational level, training history and needs, library size, and budgets. The intent is to obtain an overall perspective on RDA knowledge and adoption among public library catalogers, and to identify what levels of assistance or training may be required to help these catalogers better understand RDA, and to become more effective in their work.

Literature Review

The literature review examines several recent studies on RDA implementation and training by individual libraries. It also surveys literature dealing with catalogers' levels of education and the rural/urban divide of public library staff. As part of the implementation process, RDA training for staff plays a key role in the transition. The case studies found on RDA implementation and training deal chiefly with academic libraries but have relevance for public library cataloging. Outside of the 2013 paper by Lambert, Panchyshyn, and McCutcheon, no studies focusing directly on RDA education and training for public libraries were located.

Cataloger education and training was identified as a necessary component of successful RDA implementations. Sanner conducted a survey of academic library cataloging administrators immediately before LC's adoption of RDA.[5] The survey focused on preliminary training for cataloging staff. Sanner identified a distinction between training conducted for cataloging staff and administrators. Administrators were exposed more to RDA's philosophical concepts, while staff were exposed more to differences from previous rules. The differentiation between theory and practicality can apply to both public library staff and to academic library staff. Additionally, providing access to in-house RDA training in the library raises what Sanner calls a "mental shift," or awareness, about RDA.

Hanford discussed RDA training and implementation at Central Connecticut State University (CCSU).[6] The training aspect of CCSU's RDA implementation was complicated by the fact that staff reductions due to budget cuts and retirements were occurring simultaneously. The remaining staff lacked time to participate in formal training. CCSU used a combination of self-instruction and participation in a training funnel organized by the Online Audio/Visual Catalogers (OLAC) to provide a sizeable portion of their education and training.

Jin and Sandberg's study addresses RDA implementation and training at the University of Illinois Urbana Champaign (UIUC).[7] UIUC had a sizeable cataloging staff who required instruction. They established an RDA training task force that divided the instruction process into these categories: FRBR overview, RDA monographic, RDA Toolkit, RDA original cataloging training, and RDA training for public services staff. Specific programs targeted selective groups of staff, but the FRBR overview was provided to the entire staff. Education for public services staff included reference librarians and subject specialists. Instruction from the other categories was provided to both original and copy catalogers.

Turner's study reviews RDA training and implementation at Duke University Libraries.[8] One of the issues Turner focused on was the amount of time required for training.

Duke made a conscious effort to use online training materials and emphasized hands-on learning over classroom work to reduce instruction time. Duke's implementation group recommended placing emphasis on catalogers' responsibility for ongoing self-study over classroom instruction.

Training costs are equally as important as training time in RDA implementation. Finch addressed the issue of RDA training and education for small to medium-sized academic libraries based on Oakland University's (OU) RDA implementation.[9] Finch points out that RDA training at smaller institutions lagged behind large research universities because of a disparity in resources. In-house training, a hybrid of both online and in-person, based on adult learning theories, became OU's approach. They developed a six-week training course based on freely available RDA training materials that were accessible on the internet. All library faculty and staff received invitations to participate. OU found this approach to be an effective and affordable solution, especially for libraries operating with tight budgets.

Academic librarians conducted several research surveys on RDA implementation following LC's formal adoption of RDA. Some of these surveys included requests for information on RDA education and training. Park and Tosaka conducted an email interview survey of RDA implementation and training issues across US academic libraries.[10] They segregated their data by participants working in large academic libraries and those working at four-year colleges and universities. The survey found that individuals at the large academics benefitted more from workshops, webinars, and local training opportunities. Many of the large academics also had RDA experts on staff to assist with training. The other group relied mostly on webinars and individual self-paced online learning materials such as those freely accessible through LC. Overall, the smaller academics implemented RDA without much training. Additionally, when survey participants were asked how RDA would impact the role of the cataloger in the future, some respondents expressed concern about the divide between those libraries that can afford the resources and support to transition to RDA and those that cannot. Park and Tosaka point out that the new cataloging code could disadvantage a much larger pool of public and school libraries, as well as small academic libraries, which cannot afford the transition costs.

Haider published an extensive survey of RDA use and cataloging practices by fifty-nine academic libraries.[11] He asked how much these libraries spent on seminars, webinars, classes, books, courses, other educational resources, and conferences addressing RDA in the last year. The mean for educational spending (excluding conferences) was $639.12 per person. For conferences, mean spending was $175.58 per person. In each case, private colleges spent more on average. Haider also posed a question addressing how much libraries have continued to spend on cataloging over the last five years. In their responses, 35.59 percent of the libraries stated that they had spent "about the same," while 32.20 percent stated that they have spent "somewhat less." Only 8.47 percent stated that they have spent "somewhat more." These categories are loosely defined, but the trend for spending less for cataloging with RDA is evident.

There is literature about RDA implementation in Canada that has bearing on public libraries. Cross et al. conducted a survey in 2013 of RDA implementation in Canadian libraries, which included public libraries.[12] For English-speaking public libraries, the survey reported partial adoption of RDA at 58.5 percent, non-adoption at 35.3 percent, and full adoption at 5.9 percent. Canadian public libraries serving French-speaking populations faced a different challenge. The RDA code was not available in French until 2013, several years after the first English publication in 2010. Staff preparation and training for French-speaking librarians was compressed into a much shorter period. However, statistics by the library sector revealed that for public libraries, French-speaking libraries had the highest staff participation from all sectors (169 participants).

This section of the literature review covers data available on the rural-urban divide of public libraries and with public library staffing. There are statistical tools available that can provide demographic information for US public libraries. The most complete source for statistics is the Public Libraries Survey, which has been conducted annually by the Institute of Museum and Library Services (IMLS) since 1988.[13] The data, which are available freely, includes information about library visits, circulation, population served, size of collections, public service hours, staffing, electronic resources, operating revenues and expenditures, and number of service outlets. Users can segregate data nationally, by state, and by individual libraries.

PLAmetrics, a commercial database service, combines the IMLS data with data from its own annual Public Library Data Service (PLDS) survey.[14] The PLDS survey gathers information from public libraries across the US and Canada and presents topical data on finances, library resources, annual use figures, and technology. PLDS also publishes an annual report, *Characteristics and Trends*, which highlights trends found in the data and is available at no cost.[15]

Both of these databases can be mined for information on the educational level of staff in public libraries. The data are not granular to the extent that it identifies all the staff responsible for cataloging in public libraries, but several trends do emerge. Between FY2012 and FY2016, the rate of increase nationally of MLS librarians is 0.54 percent, while the rate of increase of non-MLS librarians is 3.24 percent. Other staff has shown a rate decrease of 1.42 percent.[16] The trend shows there is a significant increase in the number of non-degreed librarians staffing public libraries.

Real, Bertot, and Jaeger studied rural public libraries from the perspective of digital inclusion.[17] Data from their study touched upon the rural/urban divide of public libraries. Using the criteria that a public library is considered to be rural if its population or legal service area has a population of 25,000 or less, the data showed that rural public libraries:

- have on average less than one (.75) librarian with a master's degree from an ALA accredited Institution;
- have an average of 1.9 librarians, defined as an employee holding the title of librarian;
- have an average total of 4.0 staff, including both full- and part-time employees;
- have a median annual income (from all sources) of $118,704.50;
- have an average of 41,425 visits annually; and
- typically have one building or branch that is open an average of 40 hours/week.

The presence of cataloging staff in public libraries does not come to the forefront when staffing models are examined. Goodrich examined data from a Public Library Association (PLA) Workload Measures and Staffing Patterns Committee survey to investigate how public libraries make staffing allocation decisions.[18] The two major factors that influenced public library staffing were the number of hours required for opening and the times when the heaviest volume of patron traffic was to be expected. Goodrich also points out the impact that political factors (levies and budgets) have on library staffing.

Managers of rural public libraries face significant hiring and staffing challenges, which is a contributing factor to the rural-urban divide. In an overview of small public library staffing, Bliss notes that even at the rural level, technical training needs to be provided to improve the skills of library staff.[19] There are many continuing education programs available for enhancing cataloging skills but finding cost-effective programs that serve both the interests of the library and the individual staff member can be challenging. This has an impact on the ability of public library staff to obtain training in the RDA standard, especially if this training has a low priority.

Another factor that needs to be considered is that many public libraries have banded together into consortia. This allows them to centralize cataloging and processing in a more cost-effective manner. Stumpf conducted a case study dealing with the Municipal Library Consortium (MLC) of St. Louis County, a group of eight independent public libraries in Missouri, which reinforced this position.[20] In 2013, OCLC published a document titled "A Snapshot of Priorities and Perspectives: U.S. Library Consortia," which was based on a response of 101 consortia that responded to their survey.[21] The data shows that 52 percent of these consortia include multiple types of libraries (including public) and that 16 percent were for public libraries only. This is evidence that cataloging skills, and cataloging with RDA, may not be necessary or required at the individual or local library level.

While much of this literature review deals specifically with academic libraries, it supports some of the trends and issues that the authors discovered in their Ohio 2013 study of public libraries. Lack of funding and access to resources can be a barrier. There is evidence that some cataloging staff in public libraries have adopted a "learn-as-you-go" approach, working with RDA with very little formal training. This is supplemented by using free online documentation for training, if available. Other libraries do not bother or care about RDA training. There is also a gap in the literature about the impact that RDA implementation is having on public library users. Burris points out that technical services is just as integral to the user experience in public libraries as is public services, especially when dealing with emerging technologies.[22] RDA implementation, along with the potential offered by newly developing linked data systems, is going to have a major impact on user perceptions and experiences in public libraries.

Research Problem and Questions

Like the authors' original paper, we seek to understand better, and thus communicate that understanding to our readers, the challenges that public libraries may encounter and attempt to resolve while implementing into regular practice libraries' most recent version of RDA. The current paper differs substantially from the 2013 paper. The authors expanded their inquiry from one state to survey public libraries in all fifty states. Potential participants were asked more questions than those who participated in the authors' earlier effort because of "lessons learned" from their original pilot study focusing on just one state. To accomplish this more expansive research task, the authors attempt to provide sufficient data and analyses to respond adequately to the following research questions:

> How prepared are US *public library* catalogers for RDA implementation? For those public libraries already using RDA, what factors affect catalogers' use of RDA? More specifically, they attempted to address empirically the following: What is the nature of the knowledge/lack of knowledge among American public library catalogers concerning RDA, and, to what extent do demographic and other independent variables affect such knowledge?

Limitations of the Study

Despite the authors' best efforts to design a comprehensive survey in a simple and easy to complete format, the survey response rate was quite low. While this may be due to a number of factors, including possible "survey fatigue," one issue that affected the response rate particularly was an inability to acquire accurate email addresses from one primary, authoritative resource of public library directors and/or managers to whom the authors could send an invitation to participate. Of 4,163 libraries or library systems identified, 673 email invitations were "bounced back" to the authors' Qualtrics survey software after the initial invitations were sent. Due to the highly transitory movement of library directors and managers, many email addresses may have become obsolete without the authors' knowledge, a sampling issue that can occur regardless of the sources used to compile a sample population. Although the authors' survey has revealed interesting data concerning RDA's adoption in US public libraries, the relatively small set of responses from their original population list of email addresses require that the authors as researchers not overgeneralize or infer too much in their findings. However, even with a 100 percent response rate, there is always error involved in quantitative social sciences research. Despite this, their survey collected sufficient data to give most of their statistical tests enough power to discover interesting differences and associations between variables and gathered rather substantial, interesting qualitative data. The combination of quantitative and qualitative data presented below provides a more complete picture of public libraries' challenges and successes with RDA implementation.

Method and Sampling

The questionnaire design used for this current study was based primarily on the authors' earlier Ohio study, although additional variables and modifications were included in this version. When the questionnaire was completed, two public library staff members were invited to pre-test the survey and its questionnaire. Their feedback was incorporated into the final version. The authors also obtained contact information for all American public library directors from state library websites that, in the majority of cases, included a list of the respective state's public libraries. The information from these pages included the directors' names, email addresses, and other contact information. This information was recorded in an Excel spreadsheet that was uploaded to Qualtrics to distribute the survey invitation. If a particular state library website lacked a comprehensive list of public libraries and/or library systems with requisite contact information, every public library's contact information within that state was searched through online directories such as LibWeb (http://www.lib-web.org/united-states/public-libraries), with the needed information being added to the same Excel spreadsheet. At the end of this exercise, 4,163 individual libraries or library systems across the US were identified. Survey invitations were emailed to the directors of these libraries/library systems on March 17, 2017, with a follow up invitation sent on April 3, 2017, requesting that the director forward the survey invitation to the respective library system's main cataloger. "Main cataloger" was defined as the person who performed or supervised most of the cataloging for the library/library system, regardless of job title or educational level (paraprofessional or a librarian with a master's in library science). At the close of this survey on April 10, 2017, the authors received 310 valid questionnaires out of 320 (ten of whom submitted a blank survey), a 7.4 percent response rate (8.9 percent not including the invitations "bounced" back to Qualtrics). With this response rate, the authors may be 95 percent confident that their inferences used for their survey data have an accuracy interval of +/- 5.36 percent. The survey and all associated materials received approval from Kent State University's Institutional Review Board prior to data collection. Since virtually all questionnaire variables were either nominal or ordinal scales of measurement, all inferential tests performed using SPSS software to test hypotheses were non-parametric.

The questionnaire (see appendix) asked respondents to identify the respective state in which they worked. Unfortunately, due to the low response rate and not receiving public library cataloger responses from all states, the validity of statistical tests such as Chi Square was negatively impacted concerning this variable (state where library system located). To correct invalid Chi Square calculations due to more than 20 percent of cells within crosstabs having expected counts of less than five, individual states were combined into their respective Census Bureau regions. Thus, the analysis and discussion focus on the regions, if warranted, rather on the individual states. Table 1 shows the states and their respective Census Bureau regions.[23] Public libraries/library systems from forty states responded. Most responses were from Texas (n=29). Public libraries/library systems in the Northeast Census Bureau region are represented least in the survey as only 10 percent of returned questionnaires were from that region.

Findings

Four years after LC's full RDA adoption, public libraries appear to be very much in a period of transition. While 17.7 percent of respondents reported that they still use AACR2 in different formats and ways (see figure 1) and 20.2 percent report that they now use RDA, a strong plurality (48.9

Table 1. States and Census Bureau Regions. States with non-responding library systems/libraries marked (x)

Region 1: Northeast	Region 2: Midwest	Region 3: South	Region 4: West
Connecticut-x	Illinois	Delaware	Arizona
Maine	Indiana	Florida	Colorado-x
Massachusetts-x	Michigan	Georgia	Idaho
New Hampshire-x	Ohio	Maryland	Montana
Rhode Island-x	Wisconsin	North Carolina	Nevada
Vermont	Iowa-x	South Carolina-x	New Mexico
New Jersey	Kansas	Virginia	Utah-x
New York	Minnesota	West Virginia	Wyoming
Pennsylvania	Missouri	Alabama	Alaska
	Nebraska	Kentucky	California
	North Dakota	Mississippi	Hawaii-x
	South Dakota-x	Tennessee	Oregon
		Arkansas	Washington
		Louisiana	
		Oklahoma	
		Texas	

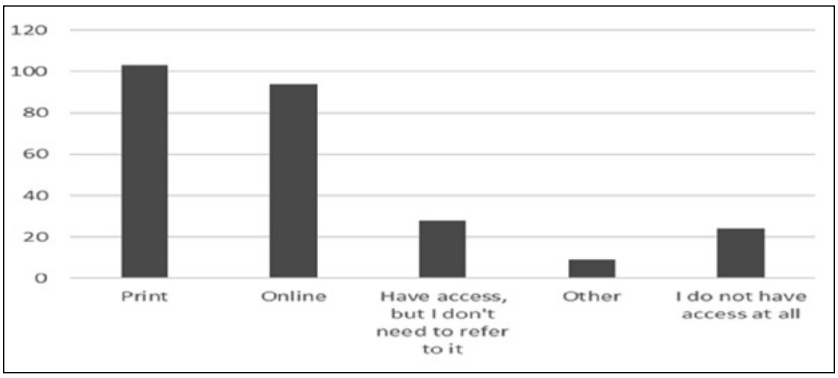

Figure 1. Access to AACR for Libraries Using it Still for Descriptive Purposes

percent) report they use a combination of the two standards in regular cataloging practice. A total of 21.6 percent of all respondents heard of RDA for only the first time during the completion of our questionnaire. Although this response is a minority of respondents, a number of other demographic factors appear to have affected this variable, although RDA has been LC's official descriptive standard for the past four years. The respondents' highest level of education appears to be significantly related to this outcome (X^2=14.871, p<0.01). Respondents who answered affirmatively that this was the first time they had heard of RDA tended not to have a master's degree, with those with either high school, associate's, or bachelor's as the highest level of educational attainment having higher observed than expected counts in the cross tabulations. Additionally, catalogers in rural public libraries/library systems were significantly less likely to have heard about RDA than were those who worked for libraries in urbanized areas/clusters (X^2=19.651, p=0.00); 12.1 percent of rural catalogers had not heard of or about RDA versus 2.0 percent of urban catalogers. As a result, these same rural respondents were significantly more likely to be using still the AACR2R or another type of descriptive standard (X^2=27.057, p=0.00), whereas a significantly larger number of urban respondents were using RDA for resource description at the time of this survey. This result may be due partly to the fact that urban catalogers appear to have generally received significantly more training regardless of format (in-person, webinars, etc.) than rural catalogers (X^2=30.497, p=0.00). In fact, 42.9 percent of catalogers who identified that their library fit our definition articulated in our questionnaire of "rural" have received zero hours of RDA training. Not surprisingly, a significant number of rural catalogers characterize their knowledge of RDA as "none" or "basic," compared to their urban counterparts whom generally consider their RDA knowledge to be "intermediate" or "advanced" (X^2=41.752. p=0.00).

Because of the apparent urban/rural divide in knowledge and application of RDA for public library cataloging, further analysis of this particular demographic factor is warranted. A slight majority (51 percent) of survey respondents worked at public libraries/library systems located in areas of the US that the US Census Bureau defines as "rural."[24] This equals very closely our participants' response to the total population of the community or communities their respective library systems serve (49.4 percent of library systems serve communities with 25,000 or fewer residents). This nearly identical result of matching between respondents' communities' respective populations with the self-identification of these same communities as being rural leads the authors to be cautiously satisfied with the definitions used in the questionnaire (question 18 in the appended questionnaire). These proportions may appear counterintuitive because the US's population is concentrated in urban areas. However, one library system may serve millions of residents within a relatively small land area that comprises a large proportion of a state's population (e.g., New York Public Libraries).

Table 2. Distribution of respondents' library systems by community population.

Community Population	Frequency	Percent	Cumulative Percent
0-25,000	123	49.4	49.4
25,001-50,000	41	16.5	65.9
50,001-75,000	15	6.0	71.9
75,001-100,000	14	5.6	77.5
100,001-250,000	21	8.4	85.9
250,001-500,000	13	5.3	91.2
500,001-750,000	6	2.4	93.6
750,001-1,000,000	5	2.0	95.6
More than 1,000,000	4	1.6	97.2
Do not know	7	2.8	100.0
Total	249	100.0	

Conversely, a rural county public library system may serve very few persons across several communities spread over a large land area, possibly with only one or very few library branches. We present the distribution of respondents' communities served by their library system by population in table 2.

Notwithstanding that a slight majority of our respondents work in rural public libraries/library systems, the majority of those same respondents who hold a graduate degree, and particularly a master's degree, work in urban public library systems. In fact, whether a public library is defined as being rural or urban appears to be a reliable predictor of whether the respondent is more likely to hold a master's degree. Using Chi Square, we discovered that the respondents' highest attainment of education is significantly related to the type of library in which they work (X^2=12.776, p=0.01). A higher proportion of respondents from urban/urbanized cluster population centers where their public libraries are located hold a master's degree than those from rural population centers (71.1 percent of urban respondents versus 49.2 percent of rural respondents). Respondents from rural libraries had higher proportions, holding only bachelor's and associate's degrees, or having a secondary school diploma, than did urban respondents.

The ordinal variable of the respondents' libraries'/library systems' total budget for all operations and functions showed a great deal of variability, revealing a bimodal distribution (see table 3). The major modal value of these data is \$0-\$250,000 and the minor mode is "More than \$1,000,000," but the median value is \$500,001-\$750,000. Again, the number of responses at what would be the left side of the distribution appears to match to an extent the left side of table 2's distribution, implying that communities with lower populations tend to have library systems with smaller budgets. Due to the non-normal distribution

Table 3. Total budget for all operations and functions of respondents' respective library system.

Library/Library System Budget	Frequency	Percent	Cumulative Percent
\$0-\$250,000	90	36.3	36.3
\$250,001-\$500,000	28	11.3	47.6
\$500,001-\$750,000	11	4.4	52.0
\$750,001-\$1,000,000	17	6.9	58.9
More than \$1,000,000	65	26.2	85.1
Do not know	37	14.9	100.0
Total	248	100.0	

of the data for these variables, and because these variables are ordinal, the authors may test this hypothesis using the non-parametric Spearman correlation coefficient inferential statistical test (*rho*). A moderate correlation and substantial relationship do indeed exist between these two variables that is also highly significant (*rho*=0.639, p=0.00). Some may argue that a statistical test does not need to be conducted to arrive at this conclusion, but smaller communities with more finances available for library budgets could easily be at the left side of the distribution in Table 2. Conversely, more populated communities undergoing financial challenges may fall towards the left side of table 3's distribution. While the *rho* coefficient is quite high, it is still some distance from a perfect correlation (*rho*=1), thus demonstrating what should be logical does not always result in absolute fact. Perhaps not surprisingly, a significant relationship exists between whether a library/library system is rural or urban and the size of the library's/library system's budget (X^2=68.946, p=0.00). Far more urban libraries (45.8 percent of urban libraries) have budgets over \$1,000,000, whereas a majority of rural libraries (56.3 percent of rural libraries) have budgets of \$250,000 or less.

The rural/urban divide between public library catalogers also extends to RDA cataloging policies. Urban public libraries appear to be significantly more likely to have standards or policies established for copy cataloging of RDA records than rural public libraries (X^2=16.056, p=0.00). Although a majority (58.7 percent) of responding rural libraries accept RDA records for copy from a bibliographic utility, urban libraries appear most likely to follow this practice (X^2=29.875, p=0.00) as an even larger majority of urban public libraries (89.3 percent) accept RDA records for copy cataloging. This highly significant result is due largely to 31.7 percent of responding rural catalogers not knowing or being unsure of whether their library/library system follows this practice. The data show that rural public cataloging staff, in comparison to their urban peers, need to improve their knowledge of RDA. They also need a better understanding of their library systems' policies concerning RDA and copy cataloging records.

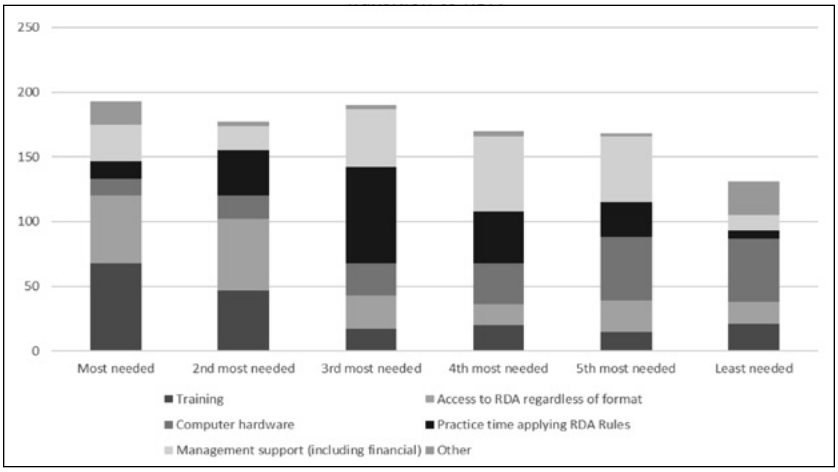

Figure 2. What is Needed *Most* to Transition to RDA

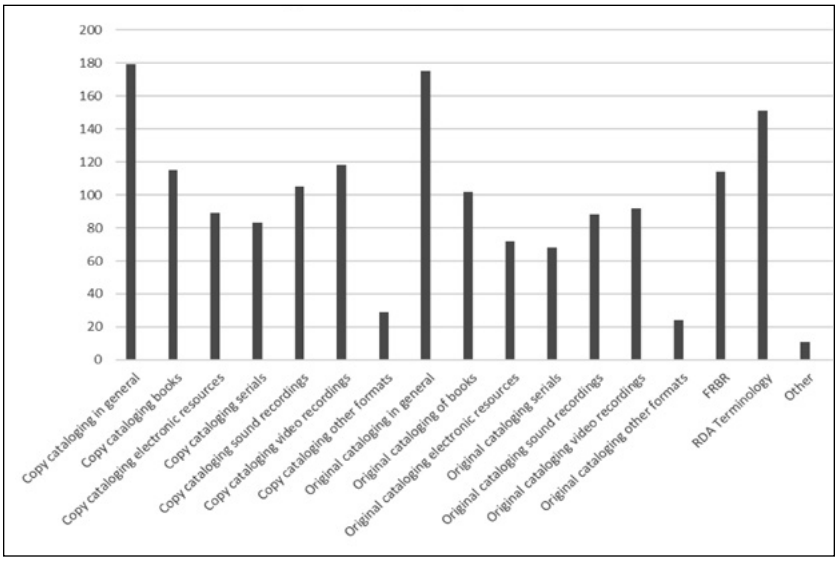

Figure 3. Responses by Cataloging Public Librarians of Type of Training Required in RDA

While certainly not every public library cataloger in the US is likely entirely comfortable with applying RDA, what potential solutions may help these cataloging personnel attain the same level of comfort they might have with AACR? Respondents were asked to rank from the most needed to the least needed, from six predetermined choices, what they perceived to be the most important factor(s) for a smooth transition to RDA. The results in figure 2 show that, by a small margin (35.2 percent to 27 percent), RDA training is perceived, perhaps unsurprisingly, by respondents to be what is needed most to transition to the cataloging standard. Access to the RDA Toolkit ranked a strong second as the most needed factor and is clearly (chosen by 31 percent of respondents) the second most needed tool. Once public library catalogers receive training and can access the RDA Toolkit, time to practice applying its rules was clearly the most important (39 percent of respondents) and was the third most needed factor. Management support figures prominently across what is needed most but is regarded as the fourth most needed requirement by a plurality (34.1 percent) of respondents. The need for additional or new equipment for public library catalogers tends to be the least needed requirement to transition to RDA.

Regarding training required for public library catalogers, what in particular do they need? Figure 3 below shows that RDA training for copy and original cataloging in general is needed most, according to respondents. However, greater familiarity with RDA terminology ranked a strong third. Increased knowledge of FRBR also ranks quite highly. Considering that FRBR is RDA's conceptual model, it seems wise for respondents to desire additional training for FRBR and/or possibly LRM.

The rural/urban divide between public library catalogers continues to be demonstrated in the knowledge and understanding of the new language used in RDA. Respondents were asked to record whether they were familiar with these seven terms from FRBR and RDA; element; preferred access point; variant access point; carrier type; manifestation; expression; and work. A highly significant relationship (p=0.00) existed between whether respondents worked in an urban or rural public library system and their familiarity with the seven terms (X^2=23.784, 16.532, 19.777, 26.623, 29.903, 25.808, and 21.118, respectively). Put simply, public library catalogers working for an urban library/library system are statistically more likely to be familiar with those terms than those working in a rural public library/library system. Perhaps not surprisingly, the respondents' level of education played just as significant a role (p=0.00) in this familiarity and knowledge of these same seven terms with those respondents holding a master's degree to be most likely by a considerable margin to being aware of these terms. Much of this gap in knowledge may be mitigated by RDA training and access to RDA as these respondents are likely capable of self-learning.

Who or which institutions are considered best suited to help public library catalogers learn more about RDA?

Respondents were asked to choose any of the nine options provided in the questionnaire. "National professional library associations" and "Library of Congress" were selected the most, although "Library consortia" ranked quite highly in third place (see figure 4). For each option, respondents were permitted to enter text that specifically mentioned the name of the library consortia, Schools of Library and Information Science (SLIS) of a university, etc., which they would like to see deliver RDA training. The American Library Association (ALA) was listed as the "National professional library association" that most respondents would like to see deliver this training. ALA was listed far more frequently than was any other organization. "Schools of Library and Information Science of a university" was chosen second least of all but elicited the most expressive of responses such as "Absolutely!" or "ALL!!!" While there was no shortage of opinions and suggestions as to which organization(s), other than the respondents' own libraries, should take the lead in providing RDA training, one respondent had an interesting suggestion that he/she articulated after selecting "Other." "Any would be good, but it would be helpful if *one specific organization* managed the overall training so that it is more consistent (*emphasis* added)."

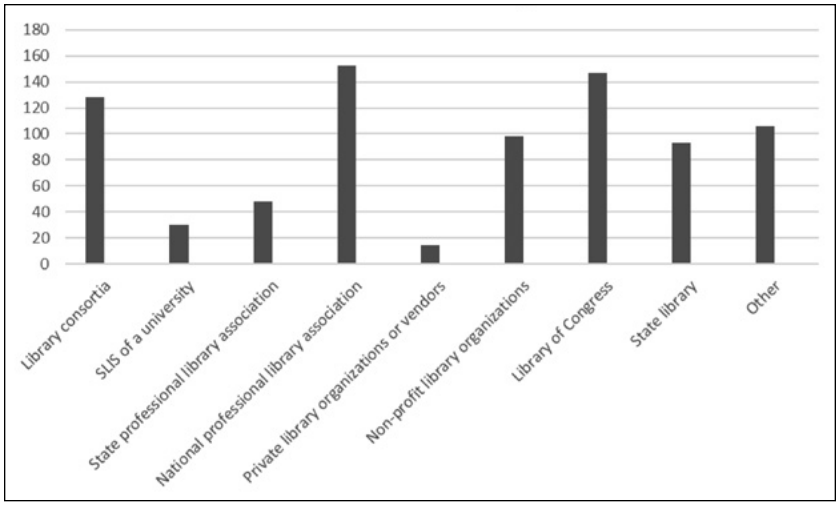

Figure 4. Organizations/Institution that Should Provide RDA Training

There are no statistically significant differences or associations between the Census Bureau Region where the respondents' library system is located and the other variables examined above. This means that where the public library system is physically located in the US (e.g., western US, northeastern US, etc.) has little bearing on RDA adoption and implementation. Thus, the differences and associations reported above between demographic variables appear to be common across the US and not limited to any particular geographic areas.

Qualitative Findings

Respondents were given the opportunity to "add any other thoughts/comments you might have about RDA adoption, your experience working with it (if applicable), and/or your library's approach to adopting it or not, especially if your thoughts could not be expressed in the [closed-ended] questions above. For example, what are challenges or obstacles to transitioning to RDA? What would help you, your coworkers, and your library make the transition to RDA?" As the study is primarily quantitative, the authors processed all the qualitative responses in an online word cloud application to see what dominant words and terms emerged (see figure 5).[25] Some of the more dominant words and themes were then searched for in the textual responses for some context where necessary.

To make the image as large as possible for our readers, "RDA" and "cataloging" do not appear in figure 5's image. Both these words and concepts relate directly to the study's purpose. However, RDA is used in reference to both the RDA Toolkit and the print version of the rules. For example, one respondent reports that the obstacles in applying RDA include "…lack of ILS support; cost of accessing RDA rules" and another wrote, "Access to the RDA Toolkit would be very useful for questions as they arise on a regular basis...," possibly meaning that this respondent's library system was unlikely to purchase the Toolkit. It is possible that this is due, as suggested above, to cost. For example, responses included "I do not have access to the actual RDA rules, just other people's interpretation of the rules, due to the cost" and "Ongoing cost of Toolkit seems pretty high and print as currently available is outdated very quickly—this creates a big obstacle for small rural libraries." "Records" is used in context with topics such as the creation and inclusion of AACR2R/RDA hybrid records: ("I catalog in RDA when I receive materials from libraries, and promote 'hybrid' records when other librarians are copy cataloging"; "We made the transition in 2013—we use RDA rules for new records, ILS was 100 percent RDA enriched in 2015, there are still records that could be termed a hybrid of RDA and AACR2 and the role of respective libraries' vendors in creating and supplying RDA bibliographic records ("Bib records were and are converted to RDA by outside vendor (MARCIVE). ILS system not utilizing yet.").

Not surprisingly, "training" also figures prominently, similar to earlier questions to respondents. In the textual responses, "training" was used in context with the lack of financial resources available to train catalogers in RDA

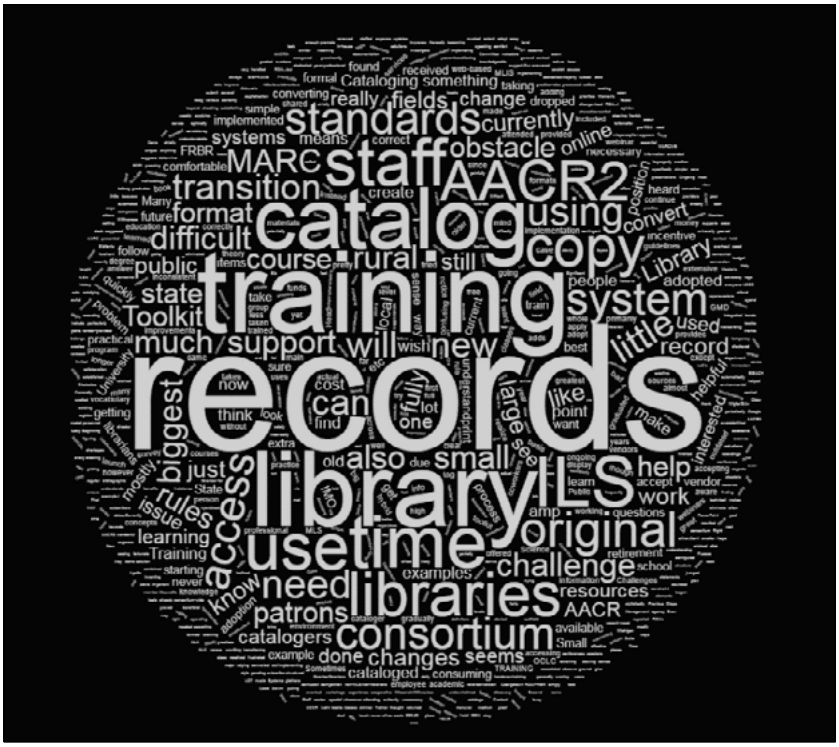

Figure 5. Word Cloud of Qualitative Responses to Survey

("Training is the biggest issue at present, which we are in the process of working on. Staff training funds running out towards the end of the fiscal year is also a challenge, as well as the pricing of some online courses"; "No money to convert existing records to RDA records. No money or time for training since all cataloging is done in-house"). However, references to training are not always negative: e.g., "Our state library agency has done a great job in providing training opportunities for cataloging staff in our state. We have access to the RDA Toolkit online as well. Beginning in 2013, RDA training sessions were held in various places in the state" and "Our library system has handled this transition and provides us training and support" are two such illustrative examples. The positive and negative textual responses regarding "training" support the authors' quantitative findings above that this aspect of addressing RDA has been uneven across US public libraries.

Although not a dominant concept from a purely quantitative analytical perspective, many respondents did not see the rationale for switching wholesale from AACR2R to RDA. Commentary on this particular theme was presented as though from a cataloger's and from a patron's perspective. One respondent wrote, "I see no point in RDA until the ILS systems start using the coding. Those extra fields do nothing in Polaris," indicating that some current software technologies are not allowing RDA to deliver its full potential to OPAC users. Another respondent commented that he/she wanted "Significant proof of how it improves the current cataloging system in place," and a respondent from another library wrote, "The main challenge is seeing the need to transition. Since MARC records are not displayed to our patrons, what's the point? To fully transition, we would need to see some actual benefit, either to ourselves (as catalogers) or to our patrons." Whereas some public library catalogers do not appear to see RDA's benefits, another had a balanced perspective of the new cataloging standard: "I can see the benefits of RDA for online resources and large academic institutes (*sic*), but an AACR3 would have been far more practical for public libraries than RDA. (It also takes an awful lot longer to catalog using it!)."

Discussion

Undoubtedly, RDA adoption and use in US public libraries is uneven. This unevenness is not found in particular geographic regions across the country; rather, the difference lies most explicitly in whether the library is located in a rural or an urban region. Other variables also have an impact on RDA adoption and use, including public library catalogers' highest level of education, library budgets, and the population of the community served. Some of these latter variables are often a reflection of whether the library is located in a rural or urban area, but one should not assume that this is always the case. For instance, an urban area located in the American "rust belt" may find its population declining to a threshold that comes close to a rural library service area, thus affecting this area's library budget due to declining tax revenues. However, the data also demonstrate that other factors affect rural library systems with regard to RDA adoption and implementation. Rural library systems are considerably less likely to employ catalogers with master's degrees, for instance. This difference may be simply because rural libraries are unable to hire as many master's graduates as urban libraries. Some reasons include budgetary constraints, availability of nearby MLS/MLIS graduates, or the willingness of degreed librarians to move to a rural area. This discrepancy may be attributed to the fact that urban libraries may hire more catalogers with master's degrees due to the size of the population and collections being served. Whereas urban areas may have fewer library systems compared to rural areas as mentioned earlier (and as our data's breakdown of urban and rural library systems/libraries suggest), these urban systems are so large in terms of collections and population served (again, e.g., NYPL) that it appears reasonable to assume they would hire more catalogers. Regardless, the discrepancy in this

particular variable (highest education attained) between rural and urban libraries should receive further research for possible solutions to reduce this discrepancy.

How might the glaring discrepancies in RDA adoption and implementation in US public libraries be addressed? Rather than singling out one particular institution such as a professional organization, LC, or library schools, perhaps the LIS discipline *and* profession should take responsibility writ large. Additionally, institutions such as IFLA (which was responsible for the creation of FRBR and its follow-up conceptual model, LRM), ALA, the Canadian Federation of Library Associations (CFLA), and the Chartered Institute of Library and Information Professionals (CILIP), along with the RDA Steering Committee, might want to consider contributing resources to assist libraries with the implementation of new descriptive standards such as RDA since the persons in these organizations presumably would be most expert on the topic. This suggestion is not to single out these named organizations as though they have not done their work or that they have not already provided some sort of training information. In fact, these organizations have already done a tremendous amount of work creating a descriptive standard that hopefully will sustain *all* libraries for the majority of the twenty-first century. However, if the people for whom this work (FRBR, LRM, and RDA) has been done are unable to perform their own professional work properly or have difficulty using the tool created for them, then one must ask if that work has been actually completed. Considering that the only constant in twenty-first-century librarianship is change, the authors suggest that this work is not complete, and look forward to both international and national library organizations' continued contributions to the professional development of *all* cataloging librarians and library technicians.

The authors hope that this discrepancy will encourage more urgent professional development discussions, particularly as their findings demonstrate that urban-rural differences as they pertain to using RDA, at this point, extend beyond the issue of cost. Based on the demographic data collected by the authors' survey, the gaps in adopting new descriptive standards exemplified by a work such as RDA appear to be based on issues beyond the control of cataloging personnel. There appears to be no lack of potential or realized intellectual capital in rural public libraries compared to their urban counterparts. Rural library staff are well educated (except for the relative lack of possession of the LIS discipline's terminal degree) and are seeking further professional development opportunities to maintain their professional practices by working with RDA. The apparent lack of financial capital that can be invested in professional development opportunities is the largest driver accounting for the discrepancy between rural and urban cataloging colleagues. As Haider found in his survey of university library catalogers, those university libraries with the most financial resources (private universities in particular) offered the greatest amount of RDA training and professional development for its catalogers. If rural public libraries want or need their catalogers to be able to effectively implement RDA, they need to allocate the funds to help their employees. With an already small tax base, and one that may shrink in the future, rural public library systems are fighting an uphill battle (although some urban areas with shrinking populations and tax bases are suffering the same fate). Although other libraries, library organizations, or individual library professionals should never be expected to support library systems financially with limited resources, these entities can give *time* back to the profession. For example, McCutcheon has created a YouTube video on cataloging with RDA expressly for practicing copy catalogers.[26] Lambert has conducted a number of in-person presentations to regional library systems across his home state accompanied by resource materials for the audience members to take back to their respective technical services departments to assist them with working with RDA. Many other LIS professionals and academics are doing the same, as are many LIS organizations and institutions that offer free or low-cost webinars or in-person presentations. While these efforts should be lauded and encouraged, they are still haphazard and largely decentralized, with perhaps many of our cataloging colleagues missing out on excellent opportunities despite good intentions.

Conclusion

It is disconcerting that 21.6 percent of respondents stated that the first time they were aware of RDA was when they completed the authors' survey. This is a stunning educational gap and demonstrates that that we are creating a large divide in the area of RDA education and training for public library staff, particularly when compared with academic library staff. The survey data show this correlation between RDA knowledge and level of education. Economics also plays a major role, since many small, rural public libraries lack funding to purchase materials such as the RDA Toolkit for their cataloging staff, or funding for training on how to use and apply RDA.

This study shows the emergence of a major group of cataloging staff in public libraries who are being excluded from the development process of current cataloging standards. It will become even more difficult for public library catalogers to understand RDA when the theoretical structure changes from FRBR to LRM in 2018. Education and professional development can be improved for our public library catalogers, especially those who serve their communities in rural America.

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Redesigning the Academic Library Materials Budget for the Digital Age

Applying the Power of Faceted Classification to Acquisitions Fund Management

Maria Savova and Jason S. Price

Most academic libraries are facing increasing funding challenges that necessitate improved budget communication and advocacy, in addition to the more traditional planning and monitoring of funds. Moreover, electronic resources (e-resources) continue to evolve rapidly, spawning new material types and modes of acquisition. This paper defines four key facets of a materials budget that has been optimized for the e-resources environment and describes a process that can be used to redesign any academic library budget structure for the digital age. Specific examples of important practical advantages that have accrued over the six years since the fully faceted materials budget structure was implemented are included.

Academic libraries serve as stewards of their institutions' information resources. The Association of Research Libraries (ARL) reported that the 114 university libraries it represents spent over $1.54 billion on library materials in 2014–15.[1] Data from the Association for College and Research Libraries (ACRL) for the same year shows over $2.18 billion spent on library materials by the 1,455 libraries that completed its survey.[2] Although these expenditures represent a steadily declining proportion of total institutional expenditure (from a peak of 3.7 percent in 1984 to a low of about 1.8 percent in 2011), the library is still an important cost center in institutions of higher education.[3]

The global economic crisis that began in 2008 brought strong downward pressure on library funding that has not been matched by a decrease in the cost of scholarly information. Consequently, university administrators are paying much more attention to library expenditures and scrutinizing annual funding requests. Although disparity between the growing cost of scholarly information relative to library funding is not new, the economic crisis greatly intensified the problem. During that period, inflation in the higher education price index (HEPI), which serves as a proxy for the change in income of higher education institutions, shrunk to an average increase of less than 2 percent per year.[4] In contrast, the average academic book (8 percent) and serial (6.8 percent) price

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increase has been three to four times greater over the same period.[5]

As a result of the annual 5 to 6 percent gap between information resource costs and the increase in institutional income, library funding requests designed merely to maintain spending power are being denied as a matter of course. Provosts and presidents are forced to choose between reducing library purchasing power every year (i.e., by holding increases to 5 percent or less) and making cuts in other campus departments. Many have held library budgets flat or reduced them, leading to greater shortfalls.[6] Recent reviews of the library budget literature have identified loss of purchasing power as a recurring theme.[7]

Even historically well-funded libraries need to improve their ability to manage and advocate for acquisition funding.[8] Good stewardship now requires advocacy just to keep up with inflation. Increasingly, libraries are commonly required to answer a variety of specific budget-related questions that can be grouped into the following general categories:

1. On what, exactly, is the money being spent?
2. How much money is left to spend this year?
3. How much money will be needed in future years?

These may seem like obvious questions, and indeed are not new. What *is* new is the frequency and sense of urgency with which they are asked, the underlying complexity that must be managed to respond accurately, and the greater importance of answering them well.

This paper's thesis is that the increased pressure on library budgets, combined with changes brought about by electronic resources (e-resources), require optimizing academic library materials budget structures to address these questions more effectively and accurately. More specifically, the authors advocate for an expansion from the standard two-dimensional hierarchical budget structure (based on subject and content type) to a four-dimensional faceted structure that also distinguishes all resources by material format (print or electronic) and acquisition mode (subscription, purchase, etc.). While most current budgets address material format and acquisition mode to some extent, faceted budget design allows these four key aspects of acquisitions expenditure to be addressed for each resource in every account. Furthermore, faceted design provides for more powerful and flexible communication and advocacy that are necessary to meet the intensifying demands faced by library acquisitions budget administrators. As such, the primary question this paper addresses is: How can academic library budgets be redesigned to best address questions about current and future acquisitions spending in the digital age?

Key Budget Functions

Library budgets support planning.[9] The importance of a budget structure that supports reliable short- and long-term planning increases as both library funding and expenditures become more volatile. Given the declining trajectory of institutional support, libraries are increasingly relying on temporary funding sources. For instance, if one-time grant funding is used to launch subscriptions in support of a new program, the library needs to plan to maintain at least some of them for the long run. It is also becoming much more common to need a plan to address pay-per-view and demand-driven purchases, and the increased potential for surplus or deficit associated with them.

Library budgets facilitate monitoring.[10] Library acquisitions budgets must allow selectors to track expenditures throughout each fiscal year. Ideally, there are fund accounts that are spent without staff intervention and others that are entirely discretionary so that fund managers know at the *beginning* of the year the amount they have to spend on one-time purchases by the end of the year. Conversely, structures that allow ongoing and one-time funds to be spent from the same account are an impediment to effective budget monitoring. Despite this major drawback, comingling of one-time and ongoing expenditures still seems to be a common practice.

Library budgets must also serve as communication tools.[11] In addition to the internal audience of library fund managers that need to understand where their funding fits in the bigger picture, the library budget structure should facilitate effective communication with faculty and institutional administrators. Fundamentally, library acquisitions budgets should be designed to be transparent, or at least enable fund managers to easily produce reports that answer the questions that faculty and administrators ask regularly.

A key new component of budget communication is advocacy, requiring libraries to simply and clearly communicate the real effect of the ongoing inflation gap on library resources. Librarians often complain about the dire state of their budgets, but administrators commonly remain unconvinced. Budget advocacy requires that institutional administrators and faculty understand the causes and impacts of budget shortfalls. When they do, they can serve as informed decision makers and advocates for funding the collections that affect their institutions' teaching and research.

Literature Review: A Brief History of Academic Library Acquisitions Budget Structure

The authors' review of the acquisitions budget literature did

Table 1. Generalized history of the evolution of the "format" dimension of the two-dimensional academic library materials budget structure.

Stage 1: "Format" as Material type	Stage 2: "Format" as Material type + Acquisition mode	Stage 3: "Format" as Material type + Acquisition mode + Material format
Books	Books firm orders	Books firm orders
	Books autoship	Books autoship
	Books standing orders	Books standing orders
Microform	Microform	Microform
Audio-visual	Audio-visual	Audio-visual / media
Serials	Serials	Serials
-		Electronic resources

i. Note that the other dimension would typically have been "subject area," with 20 to 100 more or less fine-grained categories.
ii. In Stage 3, we transition to using "material format" to refer to print vs. electronic.

not reveal previously published papers that address change in academic library acquisitions budget structure over time. Instead, the focus has been on allocation formulas (i.e., how to decide how much money to put in each account).[12] Alternatively then, to provide context and motivation for adoption of a next generation budget format, the authors offer a generalized history of academic library acquisitions budget structure. It is based on a mix of direct experience, conversations with colleagues, and tangential references to budget structure in the literature referenced in context below.

This narrative is designed to describe the evolutionary path that led to the problem that the faceted budget structure is designed to solve: there has been a dramatic increase in the variety of resources that academic libraries acquire and the means by which they acquire them, without an accompanying fundamental revolution in the budget structure used to manage them. This history emphasizes the issues that have compounded as libraries have attempted to address at least four dimensions of resource acquisition with two-dimensional budgets and introduces the case study that is the basis of the recommended solution.

Before the proliferation of e-resources, the typical academic library's materials budget was structured in a two-dimensional matrix that allocated funds across subject areas and "formats" (i.e., books, serials, microforms, audiovisuals, etc.).[13] Throughout this paper, the authors use *material type* to refer to these categories because *material format* is now more commonly used to describe the access medium (e.g., the print versus electronic nature of the material). For the remainder of this brief history, the authors use "format" to refer to the second dimension of the hierarchical budget that was paired with subject area. Each subject area had an account for each "format," although "format" often included multiple categories containing the same material type. For example, libraries created separate categories for books acquired through an approval plan or standing order (see stage 2 in table 1).[14] While the "format" aspect included a mixture of concepts, there was still a clear distinction of funds by material type, medium, and level of discretion within each individual account (i.e., the same fund was rarely used to pay for orders that are spent "automatically," such as subscriptions, together with those that are discretionary, such as firm orders).

Starting in the late 1980s, libraries slowly began to acquire resources delivered via the internet and World Wide Web.[15] When e-resources were added to library collections, they were initially tracked as part of the (print) serials budget.[16] As they grew in significance, they were typically assigned to a separate line-item as "electronic resources," initially as a stand-alone fund outside of the subject divisions, but often eventually as an additional "format" represented in each underlying subject.[17] Following the pattern used for incorporating different acquisition modes for print books, the e-resources category was added as an additional "format" for convenience. During the period when "e-resources" meant mostly ongoing e-journal content and represented a small part of the total materials budget, this addition did not pose a significant problem for key budget functions. The long-term outcome of its addition was much more problematic, however, because both e-resources and their associated acquisition modes continued to diversify into a panoply of options far more heterogeneous than those for print books.

Without dismissing the initial advantages in spending flexibility that a loosely defined e-resources fund created, it poses significant disadvantages in today's context. First, these omnibus accounts became excessively large: as of 2011, the average ARL library was spending nearly two-thirds of its acquisitions budget on e-resources, while the average North American library was spending nearly three-quarters of its budget on e-resources by 2014.[18] Second, and more importantly, these accounts became unpredictable catch-alls. E-resource accounts are commonly used to acquire: (1) multiple material types (serials, books, primary

sources, abstracting and indexing databases, streaming media, etc.); (2) resources that are acquired and/or maintained under multiple acquisition modes (one-time purchases, subscriptions, access fees, and e-standing orders); and even across (3) multiple subjects, due to the more interdisciplinary nature of many e-resource collections.[19] Finally, the expectation that these accounts contain all electronic format acquisitions is often not met, because many libraries pay individual e-book firm orders from their book accounts alongside their individual print book orders.[20]

With regard to budget function, the most serious issue with the e-resources fund is mixing acquisitions with different levels of discretion, which occurs when more than one acquisition mode is used for content purchased from the same account. It is almost impossible to plan purchasing of one-time resources when part of the funding is committed to ongoing expenditures. Because electronic subscription money is not sequestered, it is difficult to make major one-time purchases before the fiscal year end, out of fear that there will be insufficient funds left to meet ongoing commitments. This can result in a failure to provide crucial resources to users in a timely manner or missing out on special offers that might come earlier in the fiscal year. Furthermore, the challenges of spending a previously unknown (and potentially large) amount in the very short period of clarity that exists after all ongoing commitments have been met and before the budget year closes may lead to discretionary funding being misspent or remaining unspent. Unspent funds can make it appear to outside observers that the acquisitions budget is larger than necessary, even though the opposite is more likely.

The Problem and a Solution: More Dimensions are Needed

Partially in response to these shortcomings, libraries have begun to restructure their budgets to improve accounting and reporting, to realign the budget with strategic objectives, and/or to recover from related unintended consequences of earlier restructuring.[21] These are efforts to solve the fundamental problem this paper addresses: two-dimensional library budgets have been stretched and warped beyond their capacity to the point that they can no longer support basic budget functions. No amount of adjustment of a two- (or even three-) dimensional budget structure will suffice. Instead, libraries need to dismantle and reallocate their accounts into a four-dimensional faceted structure to enable the planning, monitoring, communication, and advocacy that is necessary to effectively manage a library acquisitions budget in the digital age. This new budget schema must accommodate new types of information resources and the new ways in which they are being acquired.

Due to the increased complexity inherent in information resources management in the digital age, the acquisitions budget structure should be approached as a *faceted classification system* composed of independent facets representing the core aspects of each information resource acquisition. Each facet encompasses a separate taxonomy, comprised by clearly defined, mutually exclusive, and collectively exhaustive attributes.[22] The advantage of a faceted budget schema over a hierarchical one is that it allows for every resource to be assigned one attribute from each facet. This creates a multidimensional structure that enables the budget to address today's more complex acquisitions environment. Additionally, faceted schemas are flexible and expansible, allowing them to evolve as the library's needs change in concert with developments in material types, formats, and methods of acquiring library content.

The faceted structure presented in this paper is based on a budget that was implemented at The Claremont Colleges Library (TCCL) in 2012 and remains in use as of 2018. The TCCL is a single library serving a consortium of five liberal arts colleges and two graduate institutions with total population size of about 7,500 FTE. While the library's combined constituencies represent the equivalent of a medium-size university, there is a strong emphasis on undergraduate liberal arts education, and the library also supports significant master's and doctoral graduate education and research programs.

A Faceted Acquisitions Budget Structure and its Components

Choice of Facets and Attributes

Based on TCCL's experience, the authors suggest that libraries need to expand their budget structures. Library acquisitions budgets now must accommodate at least four essential aspects of library expenditure: (1) cost center (which could be based on administrative unit/branch/department, discipline, or group of subject areas), (2) material type, (3) acquisition mode, and (4) material format. This section addresses each of these aspects (or facets) and their categories (or attributes), describing a faceted budget structure in detail. While these four aspects should be necessary and sufficient for most academic libraries, a major benefit of faceted schemas is that aspects can be added or removed when warranted. For example, as TCCL integrates endowment funding into its overall budget planning, adding a facet to indicate the funding source (i.e. institutional appropriation or endowment) could prove useful. Conversely, smaller institutions that do not currently divide their funds by subject might not have use for separate cost centers.

In the traditional library budget structure, the total budget was first divided among dozens of subjects (or cost centers) according to the size and scope of each academic department, and funds within subjects were allocated by material type. Supporting dozens of categories for any one facet under a four-dimensional budget structure is impractical because of the multiplicative nature of faceted schemas. With the addition of two new dimensions (i.e., acquisition mode and material format), the number of combinations grows exponentially with each additional cost center. Given this limitation, an institution's cost center attributes should be as broad as possible. Cost centers should be based on disciplines or branches, or some combination of the two, not dozens of individual subjects. Many university libraries have already aggregated their funding in this way, and publisher packages continue to move libraries in this direction.[23] For others, consolidating their individual subject accounts into broader discipline or administrative cost centers will require significant change.

While limiting the number of cost centers is necessary to create a manageable faceted budget, there are other compelling reasons to consolidate subject accounts. The aggregation of resources into databases and packages has reduced the number of subject-specific resources: many more now encompass multiple subjects, making subject-level tracking misleading and/or untenable. Additionally, subject consolidation allows for closer collaboration among selectors within a discipline, plus increased flexibility in spending on multi-subject purchases or subscriptions. Furthermore, consolidation creates larger accounts for ongoing resources, which moderate the impact of unexpected fluctuations in individual subscription prices. In this configuration, responsibility for the shared discipline accounts would need to be assigned to a single fund manager within a discipline group or be assumed centrally by the collections manager. Within the few budget accounts where more fine-grained planning or control may be necessary, like firm order purchasing of books by subject specialists, the fund manager can overlay a subject breakdown and/or create regular reports that leverage the subject information in underlying order records.

TCCL's cost centers are Arts and Humanities (AH), Social Sciences (SS), Science, Technology, Engineering, and Math (ST), Multidisciplinary (MD), Special Collections (SC), and Asian Studies (AS). Each institution would define cost centers to address its unique situation. For example, a regional university that supports master's programs in business and education might decide to break out these cost centers (together or separately), rather than including them within a broader Social Sciences cost center. Similarly, if an institution lacks Special Collections and/or Asian Studies programs, those cost center categories would not be included.

The *material type* facet distinguishes among different publication types. Libraries can choose the material type categories that best reflect the nature of their collections. TCCL divided its material types into four groups—books, journals and journal databases, media (audiovisual), and non-journal content (primary sources like newspapers, datasets, digitized historical documents, etc.). Journal-related content was separated into its own category due to its unique role in research and teaching and to support separate reporting for journals in annual library surveys. If the materials budget includes non-material expenditures, such as ILS or discovery system subscriptions, cataloging costs, memberships to shared archives, etc., "service" could be added as an additional material type to allow them to be tracked and reported within the faceted structure.

The *acquisition mode* facet addresses the nature of spending and the level of discretion the library experiences when acquiring materials in each category. TCCL's acquisition mode categories include:

- Ongoing—all subscriptions, access and platform fees, membership fees, etc. These are commitments whose prices can be predicted based on historical data and multi-year contracts. Unexpected fluctuations in individual orders are common, but accounts with many orders are more predictable.
- Approval plan autoship—many academic libraries use profiles to automate purchasing from one or more book jobbers. While the profiles can be modified as needed, they are fairly stable and a profile's output can be predicted based on historical data, accounting for inflation and publishing trends. These purchases do not require active ordering and the plan is a commitment to purchase until it is changed or suspended.
- Standing orders—comprise somewhat stable annual commitments to purchase book series' titles as they become available. Despite individual series fluctuations, the overall allocation of the fund can be predicted based on historical information.
- Demand-driven—this relatively new way of acquiring library materials is becoming an important part of many academic libraries' acquisitions strategy.[24] It represents a unique level of discretion since it is driven by users, not library staff.[25] Tracking it in a separate fund allows the library to monitor these expenditures closely and supports library administration with ongoing evidence of the library's responsiveness to specific user needs. Demand-driven acquisitions can be mediated or unmediated.
- Firm orders—this category requires librarians and staff to actively select and order library materials.

As the nature of spending for the different acquisition modes shifts from automatic to manual, the level of discretion increases from low to high (see table 2).

Finally, the *material format* facet indicates the resource's medium—i.e. print/physical or electronic. Physical expands the print attribute to address DVDs, CDs, etc. As noted, material *format* differs from material *type*—format is an indicator of delivery medium (physical or electronic) and type indicates the content's container (e.g. book, journal, video).

Table 2. Acquisition modes comparison per nature of spending and level of discretion

Acquisition mode	Nature of spending	Level of discretion
Ongoing	automatic	low
AP autoship	automatic	low
Standing orders	automatic	medium
DDA	governed	medium to high
Firm orders	manual	high

Combining Attributes of each Aspect to Create Fund Codes

Following Ranganathan's colon classification approach, which became the basis for modern faceted classification, our fund code syntax ensures that one appropriate category of every facet is reflected in each code.[26] The order in which the different aspects appear in the fund code reflect: (1) cost center, (2) material type, (3) acquisition mode, (4) format. There is no special significance in this order, except perhaps that it is easiest to sort funds by the aspect that appears first. AHBFE, for example, corresponds to arts and humanities, book, firm, electronic. The set of fund codes for books in the Arts and Humanities is comprised of all useful combinations of attributes of the acquisition mode and material format facets (see figure 1). The remaining combinations are formed similarly, depending on the specific situation for each cost center and the material types it acquires.

Adopting the above attributes results in forty possible accounts per cost center: (4 material types) x (5 acquisition modes) x (2 material formats), or 240 accounts across all six cost centers. However, only twenty-two of each set of forty represent meaningful combinations: some acquisition modes do not apply to all material types. Furthermore, some cost centers do not use all twenty-two meaningful combinations. At TCCL, for example, e-book approval is not used, and the Special Collections division does not acquire electronic formats. Limiting the active accounts to those that are both meaningful and useful reduces the total number of accounts used across all TCCL cost centers down to a manageable sixty-eight.

This calculation reveals that the addition of the two new budget facets (acquisition mode and material format) comes with a cost. Because each additional cost center will result in up to twenty-two additional accounts, it would not be practical to use dozens of subjects as cost centers. Assuming that libraries that track subject-level spend generally use thirty or more subjects, they would need to manage more than 660 potentially meaningful accounts if they were to include the other three recommended facets for every subject. Even after removing unused accounts for some cost centers, it would be too cumbersome to maintain the hundreds of remaining accounts.

For more specifics on TCCL's faceted budget structure and an extensive description of the process necessary to transition from a standard two-dimensional budget to a custom faceted budget, consult the implementation guide, which includes sections on (1) choosing of facets and attributes, (2) "translating" past acquisitions expenditures into the faceted format, and (3) operationalizing the schema, including allocating, reporting, and macro-budget forecasting.[27]

The Rewards: Simple, Accurate Tracking of Allocations, Funds Remaining, and Future Needs for Any Facet Combination

This final section demonstrates the powerful new ways that libraries that adopt a fully faceted four-dimensional budget structure are able to: (1) analyze current funding allocations, (2) track discretionary funds remaining in the current fiscal year, and (3) create multi-year funding need forecasts. It returns to the authors' three basic questions, highlighting the improvements in *fund-level* reporting made possible for each due to the faceted 4D model.

Each question is addressed with before-and-after figures depicting the most accurate summary response available from the two-level hierarchical "before" design versus the faceted, four-dimensional "after" design. Each pair represents one of many possible examples of the improved functionality made possible under the faceted 4D schema: its mutually exclusive and collectively exhaustive nature empowers simple manipulation of fund level values with pivot tables and pivot charts to address a multitude of questions. The simplicity and repeatability of these analyses support effective ongoing internal and external communication of budget specifics.

Although libraries with systems that support custom reporting based on *acquisition-level* order records might be able to create somewhat more sophisticated "before" reports than depicted here, those reports depend on fixed

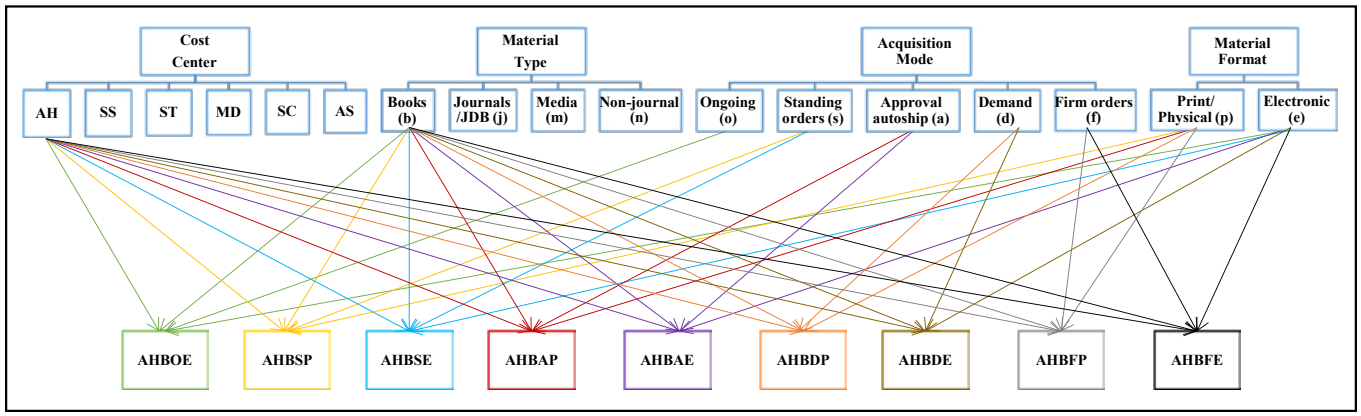

Figure 1. Set of Fund Codes for Books in the Arts and Humanities Cost Center

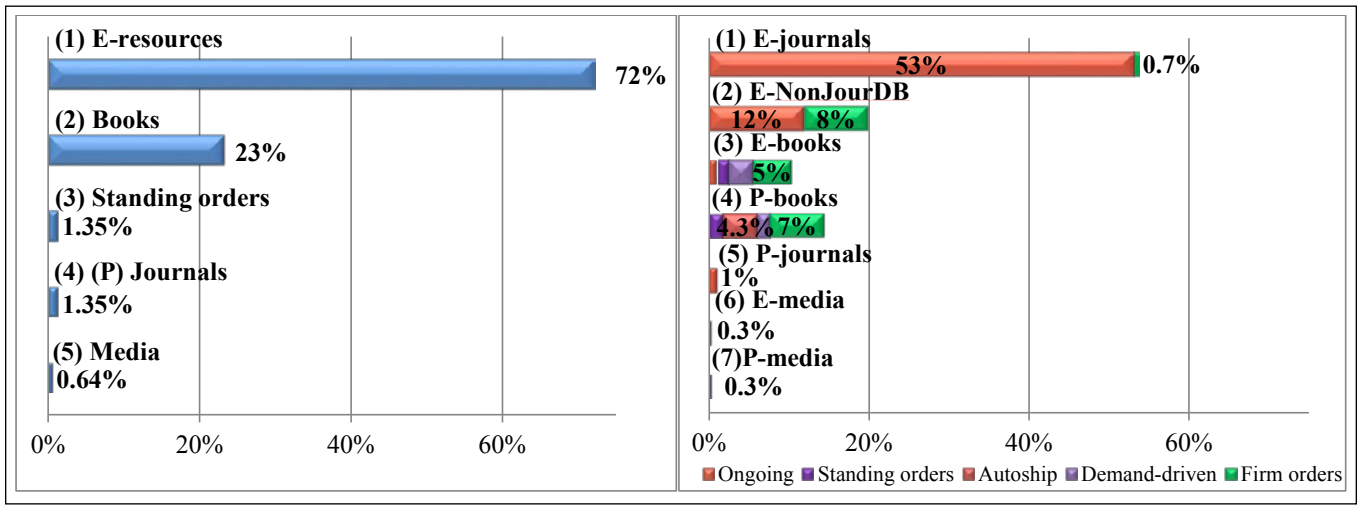

Figure 2. Format Expenditure Report—Before and After

field data that is often incomplete and/or inaccurate, and the resulting synthesis, analysis, and reporting is labor intensive and complex. All the proportions and values shown in the "after" figures are based on combinations of *fund-level* budget or actual totals: no acquisition-level effort is necessary, other than that required to assign each acquisition to the appropriate fund.

On What, Exactly, is the Money being Spent?

This question is subdivided into two more specific allocation-based questions that collectively address three of the four facets. Although examples for the fourth (i.e. cost center) are not included, in practice the authors frequently include it to provide evidence to faculty that the library's spending patterns appropriately reflect each discipline's priorities.

How Much Does the Library Spend on Print Books or Electronic Journals?

This question could not be answered with the "before" fund structure (see figure 2). Print books could not be separated from e-books since both print and e-book firm orders were paid from a book fund. Similarly, e-journal expenditures could not be separated from primary source purchases or e-book package subscriptions as all three categories were paid from the e-resources fund. The only "format by material type" question that could be addressed under the "before" schema was the allocation to print journals. The library budget did not address single-facet material type or format questions such as: how much is being spent on books versus journals? Or, how much is the library spending on print versus e-resources?

Under the "after" 4D budget schema (see figure 2), these questions are easily answered. Each of the material

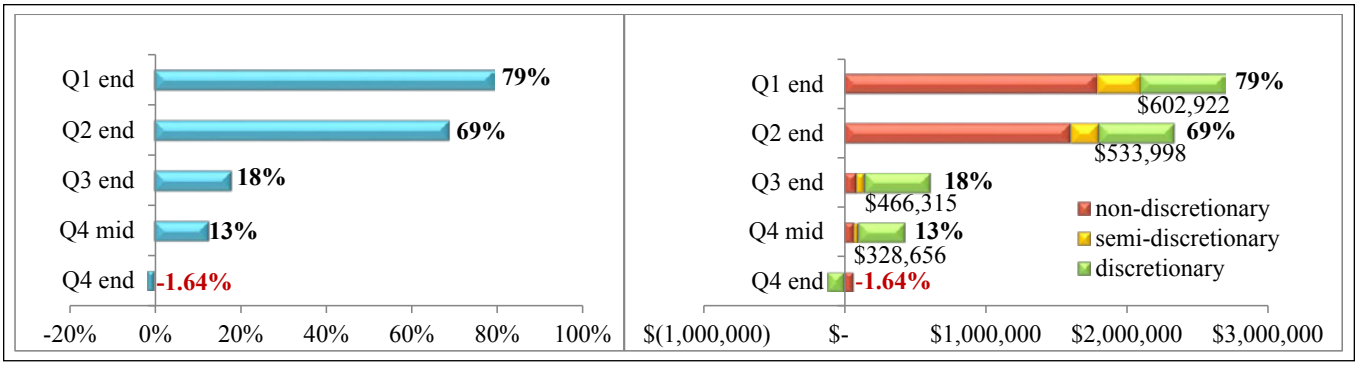

Figure 3. Funds Remaining—Before and After

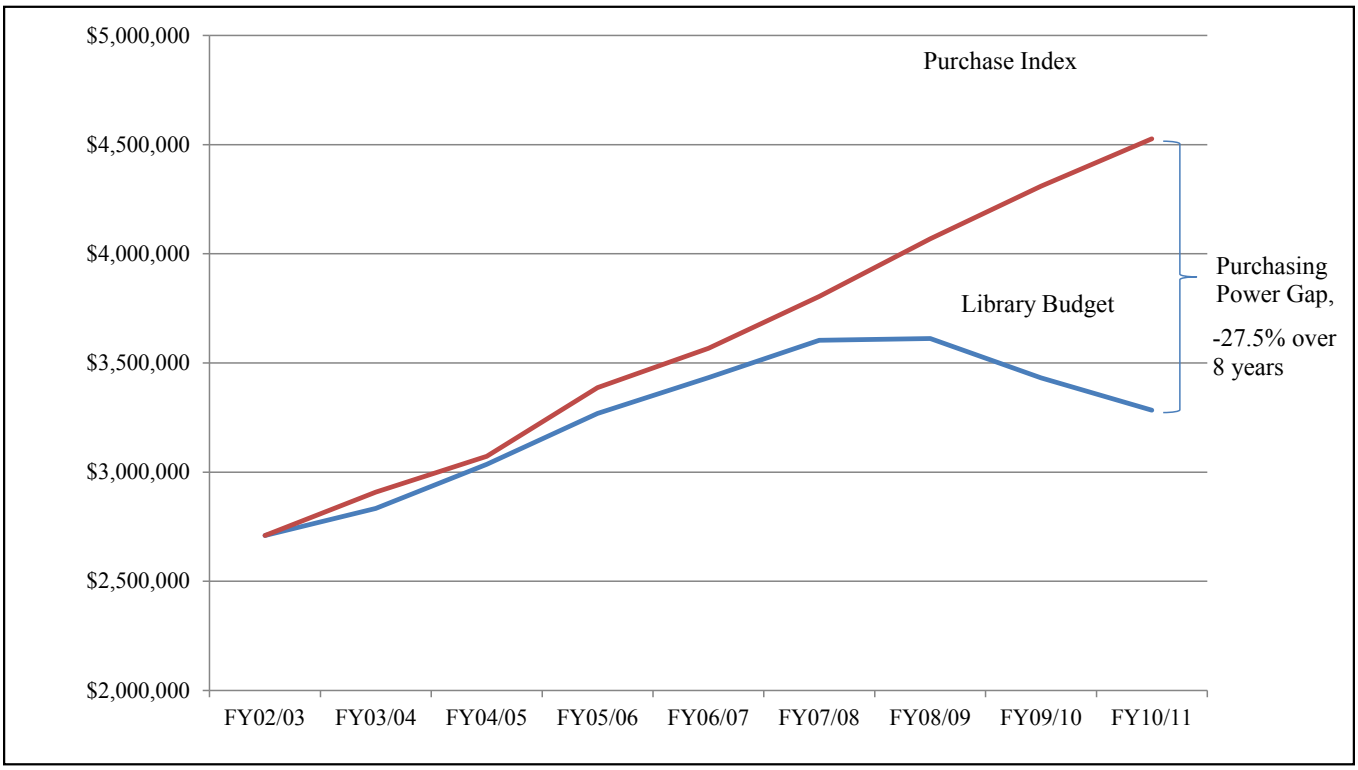

Figure 4. An Early TCCL Figure Used to Communicate the Inflation Gap Based on Industry Averages of 6 to 8%

types has separate print and electronic funds, so one can easily report that 15 percent of the budget is spent on print books and 54 percent is spent on e-journals. In total, 25 percent is spent on books overall versus 55 percent on journals, and 84 percent is spent on electronic resources (figure 2, bars 1, 2, 3, and 6), leaving just 16 percent for physical resources (figure 2, bars 4, 5, and 7).

How Much Did the Library Spend on Purchases Versus Subscriptions?

Although most subscriptions are included in the e-resources fund using the old schema, it also included many purchases, so it was not possible to distinguish between amounts spent via these two acquisition modes. Adding the standing order, autoship, demand, and firm order acquisition mode totals (depicted by the purple, orange, yellow, and green portions of each bar) illustrates the proportion of the budget spent on purchases (~33 percent).

How Much Money is Left to Spend this Year?

The primary audience for this question is internal to the

Table 3. Average annual increase percentage per different types of ongoing resources

Ongoing Commitments per MT/MF	% of Total Budget	Annual Expenditure (USD)	% Increase
E-journal subscriptions	58	5,800,000	5.40
Non-journal subscriptions	18	1,800,000	3.05
E-book subscriptions	3	300,000	8.49
Print journal subscriptions	1	100,000	4.08
Average for all ongoing commitments	80	8,000,000	4.97

library. However, it has a direct effect on the ability to meet user demand in a timely manner: the people developing the collection need to track throughout the year how much money is left to be spent on larger purchases by the fiscal close. That is, of course, what budget allocations are designed to do. Answering this question is a simple matter when all of the expenditures within a given fund account are designated for one-time purchases, but when ongoing subscriptions consume a large, unpredictable portion of the allocation, it is impossible to determine how much is available for discretionary spending until all subscription payments have been made. This uncertainty, which is unavoidable in two-dimensional subject x content type "before" budgets, causes the proportion of discretionary dollars in every "multiple acquisition mode" fund to be obscured until all no- and low-discretion (subscription, standing orders, etc.) orders have been paid.

With the "before" budget structure (see figure 3), knowing how much has been spent during the first three quarters of the fiscal year does not provide information regarding how much discretionary funding is left to spend because an unknown portion of the remainder is still committed to non-discretionary spending. Since the majority of subscriptions are not paid until Q3, the "before" answers to "How much (one-time purchase) money is left to spend this year?" were: [Q1 and Q2]: We really have no idea. [Q3]: We have some idea, but still cannot be sure. [Mid Q4]: Now we know, but only one month is left to spend it!

In contrast, adding the *acquisition mode* facet of the "after" budget allows separation of estimated discretionary purchasing from ongoing commitments at all levels of focus at the start of the fiscal year (see figure 3, "after," green portion of bars). This allows libraries to track discretionary balances throughout the year, enabling them to make major purchases whenever optimal, based on clear intelligence regarding the amount of discretionary funding still available. As with all budget allocations, the values sequestered for ongoing commitments are estimates, while historical annual increase data from well-defined groups of resources organized under the faceted budget schema provide best estimates and a track record of their level of accuracy.

With this schema, the response to the question "how much money is left to spend this year?" is much more robust regardless of when it is asked: non-discretionary allocations are designed to be spent entirely automatically. While the library still has to address fluctuations in the predicted increases in subscription cost, calculating that prediction as close as possible in advance applying the new structure limits uncertainty to a minimum.

How Much Money Will be Needed in Future Years?

The two-dimensional budget structure did not support forecasting. Furthermore, its mixed acquisition mode funds created conditions that obscured the extent to which e-journal subscription inflation was squeezing out book purchase funds. In addition, TCCL faced two years of budget cuts, which turned slow deterioration into a full-blown crisis. The "before" budget structure left library administration unable to make a case based on past spending patterns: the case for restoring and increasing the materials budget was constructed from historical industry averages (see figure 4). The resulting "open jaw" attracted immediate attention, although it could not realistically answer the fundamental question: how much will be needed to maintain purchasing power for the *local* collection in the future? In fact, using historical industry averages to create a purchase index put the library at risk of asking for more funding than needed because the actual local increases were somewhat lower (see table 3) and the proportion of the budget related to each was unclear.

In contrast, the four-dimensional budget structure supports detailed analysis of cost increases based on the specific underlying resources in the library's collection. With this "after" budget structure, differential inflation rates for specific groups of materials are easy to calculate. Fund-level analysis showed that the overall annual increase across the range of subscription types varied from 3 to 8.5 percent (see table 3). These data are based on a line-by-line review that determined the appropriate percent increase for each resource based on historical data and current multiyear contracts. The dollar amounts were altered for confidentiality; however, the percentage increases and the proportion of the whole pertaining to each category are accurate. Subscription prices of e-journals increased

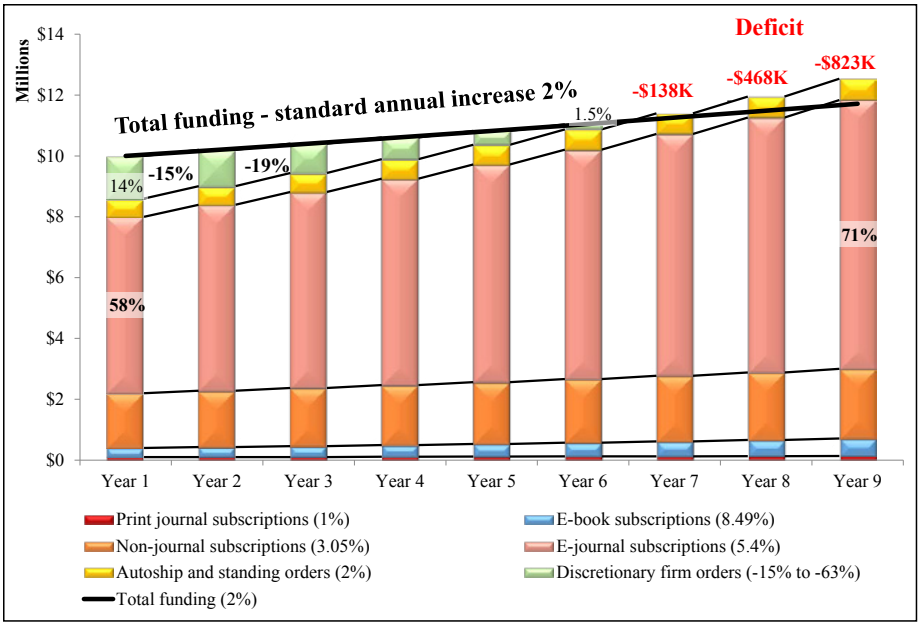

Figure 5. Forecast of the Impact of Inflation on Discretionary Funding under a 2% Annual Funding Increase Scenario

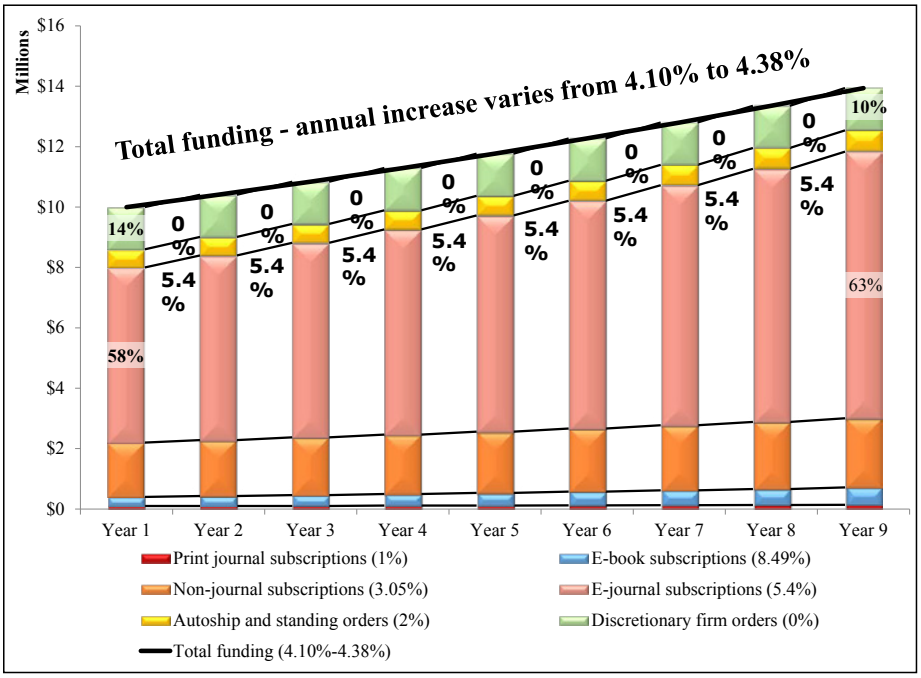

Figure 6. Forecast of the Funding Necessary to Maintain Local Spending Power

faster than non-journal subscriptions (e.g., primary source subscriptions and hosting fees, etc.). Similarly, large e-book subscriptions created added inflation pressure, while print journal increases were more moderate.

These locally derived increase percentages were then combined with the percentage of the total budget spent on each category to forecast the impact of local inflation on future spending power (see figures 5 and 6). Assuming a 2 percent annual increase in materials budget funding, this analysis demonstrates the sizable negative impact of materials inflation on future discretionary purchasing. If current subscriptions are maintained, the discretionary portion of the budget in year one (14 percent) shrinks dramatically in years two through six and is completely gone by year seven.

Using these same underlying data to address the question at hand, overall budget increases needed to maintain discretionary spending into the future can be projected (see figure 6). All non-discretionary and semi-discretionary resources are renewed by applying their respective overall increases annually. In this scenario, funding for discretionary purchases (in green) is maintained by keeping the dollar amount flat, although this does not account for inflation in the per unit cost of firm orders. The inflation rate of each group leads to a change in its overall proportion of the budget, as exemplified by e-journal subscriptions growing from 58 to 63 percent of the total budget over the span of nine years, while the proportion of firm order funding shrinks from 14 to 10 percent over the same time period.

It is important to emphasize that the annual funding increases represented by the top line (see figure 6) were derived by applying the appropriate increase to each acquisition mode/material type/material format combination, taking into account its relative proportion of the total budget expenditure. Here is the answer to the final question: TCCL needs an increase of 4.10 to 4.38 percent annually to maintain purchasing power. It is one thing to claim consistently that more materials funding is needed, and it is

another to present compelling, data-rich figures and tables to support those claims specifically and accurately. The ability to project future needs in this way has served the library's users extremely well by gaining the support of The Claremont Colleges administration and faculty.

Conclusion

In a time of greater scarcity than academic libraries have previously experienced, and when there is a growing expectation for immediate access to the burgeoning universe of increasingly discoverable content, it is crucial to manage library acquisitions budgets as well as possible. Budgets must excel in their support for planning, monitoring, communication, and advocacy, empowering libraries to optimize where and how these limited funds are spent. Yet few academic library acquisitions budget structures meet this standard. They cannot support these basic budget functions because they have not kept pace with the increasing variety of resources and the new ways that libraries acquire them.

Steady growth in the number and variety of e-resource acquisitions *has* forced some incremental adjustment to the prevailing budget structures of the previous century. However, content and price model complexity has increased to where the incremental strategy of adding additional categories to the typical two-dimensional budget is failing. Most current library budget structures cannot support accurate, efficient, and effective answers to basic budget questions, especially in the new environment where e-resources are the majority.

Thus significant budget restructuring is needed. The authors believe that twenty-first-century budgets must be designed as multi-dimensional models that employ fully faceted classification schemas. This paper focuses on a four-dimensional structure that has been used at a mid-size academic library for six years. Although the appropriate attributes and their combinations will differ for each library, these four facets (cost center, material type, acquisition mode, and material format) should be both necessary and sufficient for most academic libraries. Furthermore, the faceted structure can be easily tailored to support any academic library's unique situation. A detailed practical implementation guide is provided by the authors as a separate publication to describe the process used to transform our budget to make it easier for others to redesign their own.

Sample figures produced from the restructured budget and created for librarian, faculty, and university administrator audiences provide examples of the efficacy of the new structure. These figures and tables provide ready examples of answers that elucidate how library funds are spent, predict end of year actuals throughout the year, and demonstrate the effect of the current budget scenario on future library purchasing power. Because effective command over and communication of these factors is becoming fundamental requirements for good stewardship of library resources, this paper posits that the majority of academic libraries should restructure their budgets to include the facets and functionality described herein.

In conclusion, one can identify a number of outcomes supported by a fully faceted budget structure: it clarifies the library's stewardship of institutional resources; it facilitates both internal and external communication and advocacy; it provides for greater ongoing control of the spending throughout the year; it establishes a structure for the annual allocation process, allowing for greater transparency in decision-making; and it supports long-term planning and incorporation of strategic directions into the budget. The authors believe these outcomes provide powerful justification for multi-dimensional fully faceted budget redesign as well as any organizational changes that might need to go along with it.

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E-book Use over Time and across Vendors in an Interdisciplinary Field

Daniel G. Tracy

This paper presents an analysis of e-book usage in one interdisciplinary research collection, for library and information science (LIS), at a large research institution. Drawing from the social sciences, humanities, and computer science, LIS exemplifies the challenge of analyzing use of interdisciplinary collections that cut across Library of Congress (LC) class ranges normally used to analyze disciplinary differences in the existing literature. The analysis also explores use factors beyond LC class that usage studies rarely examine, including genre and audience level, and changes in use over time across categories. This study contributes both to understanding the usage of LIS e-books as an exemplary interdisciplinary collection and to developing options for analyses of e-book collections that maximize the utility of usage reports despite their challenges. As e-book collections mature and the utility of comparing used versus unused titles wanes, such strategies will become necessary to make more nuanced decisions for e-book collections.

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The present study analyzes Library and Information Science (LIS) e-book collections usage data at a large research institution as an exploration of how e-book usage might be examined in more detail for individual disciplines, and in this case, a particularly dispersed discipline with content across different areas of the Library of Congress Classification (LCC). It also considers methods that might be adapted for overall collections analysis. The author seeks to consider temporal factors of e-book use that have not frequently been measured in e-book usage analysis.

This study pursues three interrelated questions in the course of analyzing these statistics. The first question establishes factors for comparison of relative use in the context of particular disciplinary collections, but which could also be used for general collections analysis:

1. What patterns of usage emerge for LIS e-book content in relation to: a) different subdisciplinary areas? b) different genres of book? and c) audience level for the text?

The second question seeks to expand analysis of e-book collections over time. Prior studies rarely examine change over time, and typically focus on all use within a particular set time period (often coinciding with a vendor trial). This lack reasonably derives in part from the relative youth of e-book collections; the present study explores a disciplinary area that made a relatively early conversion to e-book purchases at a large research university, and thus provides

an opportunity to examine these temporal factors in an established e-book collection.

2. How does usage of LIS e-books vary across temporal dimensions, including semester-by-semester evolution of e-book use over a five-year period of significant growth in the e-book collection, and when considering use over the life of titles from the year of publication forward?

The third question seeks to test new ways of using e-book usage statistics provided under the primary standard for electronic resources statistics, COUNTER, which, as described in the literature review, poses substantial challenges for in-depth analysis.

3. Does our understanding of the patterns of use in the collection change when using different methods, including the common method of counting use versus non-use and alternate options such as creating categories of use (grouping titles that have use within a particular range) or analyzing the top quartile of used books?

While investigating these questions, the present study examines usage statistics from a large research institution with a major graduate program in library and information science and a related program in informatics, plus a significant group of active librarian-researchers. LIS as treated here is an interdisciplinary field that draws methodologies and publication patterns from the social sciences, humanities, and computer science (and sometimes other fields). LIS collection development funds at the institution serve researchers and students working in areas that extend beyond management of libraries, museums, and archives and development of related services. This includes areas such as history of the book, publishing, children's literature, and reading; the economics of information; historical and social aspects of information technologies; informatics; knowledge management; book arts; censorship; human-computer interaction and user experience; and other fields. Some of these areas involve coordination of collection development with other subject selectors, and many of these areas are likely to be studied by patrons other than the faculty and students of the library and information science program or the library. This broad spread of disciplinary topics and approaches makes it a good candidate for examining usage in an interdisciplinary collection.

The study's implications are not limited to collections and services related to library and information science but also for how future e-book studies are conducted. The interdisciplinary breakdown of the collection suggests possible problems with how prior studies have divided up disciplinary categories, and studying usage patterns over time has potential to add nuance to collection development and management strategies for e-books as they become more established parts of the collections landscape.

Literature Review

Researchers studying e-book use have had to contend with the challenges of e-book usage reports, which sometimes are not provided forms that are compliant with COUNTER. Even when vendors do use COUNTER, they may implement the standard differently, leading to what Conyers et al. refer to as "a lack of clarity and consistency around treatment of usage data" that calls for better standards and implementation.[1] Key issues include the lack of comparability between a counted e-book use and a print book checkout, or between e-book uses counted through COUNTER Book Report 1 (which reports uses of individual books in their entirety) and COUNTER Book Report 2 (which reports uses of sections of books), where the latter would presumably count more uses than the former if the same user engaged with multiple chapters of a title. Individual vendors may operationalize the same report to different results. Neither report can count uses that happen after a download occurs, and platforms with heavy digital rights management (DRM) that requires users to return to the platform for each reading, rather than download, will also produce larger use counts (unless the DRM prevents readers from returning). Some studies use transaction logs to conduct deeper analysis, and in a study of Ebook Library (EBL) transaction logs, Zhang, Niu, and Promann found that 8 percent of sessions included at least one download action.[2] The author notes that EBL has since been absorbed, with ebrary, into ProQuest Ebook Central. This study refers to the platforms as they were called before this change.

Studies seeking a deeper understanding of use, and that lack access to more detailed transaction logs, avoid these problems by ignoring usage totals and counting only whether individual titles have been used.[3] In one of the only studies to examine usage across time, Chrzastowski found a large increase in total uses across e-book collections at a large research institution between 2008 and 2011 and a smaller but substantial increase in the overall percentage of titles used in the same period for the four top vendors with comparable download/usage models.[4] In some cases, studies also compare the relative extent of use of e-book subcategories (in terms of percent of titles used) to their overall size within the collection (for example by LC class range) to identify under- or over-performing categories of e-books.

Several studies that examined transaction logs revealed that much e-book use is either ephemeral or relates to quick browsing, a phenomenon Staiger identified in a

review of the e-book literature as a "use rather than read" phenomenon.[5] Zhang, Niu, and Promann calculated that 80 percent of reading sessions in EBL transaction logs in an eleven-month period included views of thirty pages or less.[6] Likewise, Chrzastowski and Wiley found primarily use of sections of titles and cautioned against dismissing briefer "use" transactions since such uses may serve an important discovery and evaluation role for users.[7]

By extension, a relatively small number of users and books accounts for most uses and the most time spent using e-books. Ahmad, Brogan, and Johnstone investigated what they call "power user" behavior, finding for one set of EBL transaction logs that 1.32 percent of users accounted for 12.81 percent of book views, 12.06 percent of time spent browsing, 27.50 percent of time spend reading, and 27.81 percent of unique titles browsed or read.[8]

Beyond examining the overall growth in the use of e-books, e-book usage and transaction log studies have primarily focused on comparing interest in e-books across the academic disciplines, with LCC ranges serving as proxies for disciplines. An early report by the UK's Joint Information Systems Committee (JISC) National E-books Observatory Project discovered high use of business titles but very low use of engineering titles, and moderate use of media studies titles; but both business and engineering users spent more time in e-books whereas media studies users looked at more pages.[9] Al, Soydal, and Tonta found the most use in medicine, followed by education and (unusual among e-book studies) language and literature.[10] Despite overall low use, Ahmand, Brogan, and Johnstone found that "power users" (those who use both many titles and significant portions of titles) tended to cluster in the health sciences, business, media, engineering, computing, education, and law.[11] Levine-Clark analyzed global use of ebrary and EBL titles through transaction logs, and found disciplinary trends that diverged by type of use: STEM titles had the most page views per session and most downloads; arts and humanities users spent more time per session looking at less of the book, suggesting immersive reading; and the T and F LC classes (Technology and History of the Americas) showed use of the most pages per session, but while technology was heavily downloaded, history was not.[12] He suggests the necessity of thinking of both intensive and extensive use of e-books across disciplines in different formats. Knowlton indicated heavier use of e-books in science and education and less by humanists and mathematicians.[13]

Within these disciplinary studies, LIS is usually treated as equivalent to the LC "Z" class range or grouped with several other class ranges into a set of "other" titles. Levine-Clark's global EBL and ebrary use analysis grouped Z, A, and G class ranges into such an "Other" category, effectively excluding them from parts of his analysis related to percentage of titles used. However, he includes all classes in his breakdown of intensive and extensive use: for EBL, Z titles performed on par in terms of number of titles used but saw more extensive than average use of copies and downloads, and lower than average use of views and prints; in ebrary, Z overperformed in terms of number of titles used, but had lower-than extensive use for all use types except downloads, which exceeded the norm. Analyses of Z titles have diverged otherwise. Linden, Sidman, and Tudesco showed underperformance by Z titles relative to the overall collection, but Knowlton showed approximately even use of Z e-books relative to the overall collection and a preference for e-books over print books for Z titles.[14] Sprague and Hunter showed use of under 20 percent of Z titles in an early study.[15] More recently, Mays demonstrated low levels of both "grazing" (short-term loans) and purchasing of e-books in a PDA program for Z titles, but her analysis is limited to raw totals and not relative use compared to presence in the collection.[16] Regardless of findings, these studies all treat Z as equivalent to library science (or bibliography). This poses problems for understanding LIS collections both because the Z class range is split between LIS content areas and bibliographies for other disciplines, and because LIS content exists in a variety of other class ranges as a highly interdisciplinary subject area.

A smaller number of studies have compared e-book use across factors other than disciplines. Comparing use of essay collections and monographs, Freeman and Stewart Saunders found that readers of collections read more pages per book and more passages but cautioned that the difference was small.[17] Horner found that use of university press titles was greater than other publisher e-books, a pattern that was not true for the same books in print.[18]

Vendor platforms can affect usage statistics in ways that extend beyond the problems of usage reporting methods. For example, factors tied to the user experience of the platform and the purchase model used with the vendor may impact use. Slater and Lamothe both found that use of title-by-title e-book selections outpaced titles purchased in packages, which at many libraries is part of agreements with different vendor platforms.[19] More recently, Olney-Zide and Eiford performed a user study to identify preferred e-book platform features and analyzed how five major vendors compared on those factors and overall use. They found better user experience matched higher use of titles from particular vendors, both in terms of overall number of titles used and depth of use of those titles.[20]

Method

The head of cataloging provided a list of e-books in the library's collection from the local catalog (which includes all institutionally purchased e-book titles) that fell into any of

Table 1: Library of Congress Class Number Ranges in Study

Class Range	Topical Coverage*
AM [all]	Museums. Collectors and Collecting.
AZ [all]	History of scholarship and learning, The humanities, Digital humanities.
CD 921-988	Archives.
HC 79.I55	Economics of Information.
HD 30.2	Knowledge management, information management.
HM 846-855	Social aspects of information technology.
KF1263.C65	Computers and Privacy.
KF2971-3194	Copyright.
QA76 [select class numbers]	Historical and social subtopics related to computer science.
PN1009	History of children's literature.
T14-14.6 and T58.4-58.9	Information technology, particularly philosophical and social aspects.
Z1-1039	Books, book history, libraries, bibliography [only works on the practice of].
ZA [all]	Information resources.

*Topical coverage descriptions from Library of Congress documentation, but in some cases adjusted for local collections emphasis.

the LC class number ranges used for the LIS approval plan plus select other areas purchased heavily for LIS but not on the LIS approval plan (see table 1). This allowed for inclusion of relevant titles outside the Z range plus exclusion of the subrange of Z devoted to national and non-LIS subject bibliographies, which are not collected by the LIS selector. Titles included e-books with an eligible class number listed in a second call number in the record and titles where the primary or only class number fell into eligible ranges. Any book with an eligible class number in either slot qualified for inclusion; if an e-book had two eligible class numbers, the first was used for analysis.

From this data set, titles prior to 2006 (older than ten years at the time of data collection) were eliminated to focus on a manageable time span with a relatively significant number of titles per year. Also excluded were titles with class numbers outside the appropriate ranges but included in the original data due to the search parameters. Because the method for pulling the eligible e-books might miss titles, the researcher compared the list to e-books purchased title-by-title on approval since that process had begun for e-books in academic year 2010–2011 and added missing titles to the list. These mostly included titles outside the ranges listed in table 1 but relevant to the discipline and were grouped with the original list in broader class ranges (e.g., P instead of PN), with some classes assigned to an "Other" group for analysis due to very small numbers of texts.

The data set of titles included catalog metadata with some missing values and inconsistencies in representation of element values. A graduate student working with the researcher cleaned the data set by comparing data against catalog records and correcting missing or badly formatted values. This process led to discovery of titles with multiple e-book copies in the catalog from distinct vendors or multiple e-books on the same record (as part of a book series with links to each individual title). The student added or separated these titles into separate rows as necessary. Finally, the student added two hand-coded fields for each book to capture elements not included in typical catalog metadata that might play a role in use: 1) the text's genre, using a set of fixed codes provided by the researcher (Bibliography; Encyclopedia; Handbooks, Guides, and Technical Manuals; Proceedings; Textbook; Monographs; Collections; Other Reference; Reports; Other) and 2) the text's audience level as represented by the GOBI acquisitions platform used to order books (Advanced Academic, General Academic, Professional, Popular, or Basic), which indicates complexity and specialization of the content. The researcher resolved any ambiguity related to genre, missing audience levels, or other issues with metadata fields as the student tracked them and performed other random checks of the cleaned data during the process to ensure overall consistency.

The student merged the cleaned data set with monthly usage data from vendor usage statistics for the most recent five fiscal years as of the collection (July 2011 to June 2016). Merging is time intensive and cannot easily be automated: ISBNs accompanying usage statistics often do not match catalog records or even the ISBN on the e-book website. These statistics were largely from COUNTER Book Report 2 reports (downloads by section, henceforth BR2), but one vendor (EBSCO) provided COUNTER Book Report 1 (downloads by title, henceforth BR1), and two other vendors (Brill and Palgrave) provided both BR2 and BR1 reports due to different download options for titles. In some cases, codes were used in place of usage totals to indicate reasons for missing values or special cases of zero. For example, "U" was used to indicate instances where a title was published but not yet owned by the library. A "Z" was used for "implied zero": for example, when the COUNTER reports lacked totals for a title published and owned in a given time period, they implied there was zero use for the period of the report. Some vendors list zero-use titles explicitly, but the COUNTER standard requires only listing of used titles for a report period. BR2 and BR1 monthly totals were listed in separate sets of columns.

Table 2: Total Titles by Vendor

Vendor Type	Vendor/Platform	Titles
Vendor platforms included individually for analysis.	Brill	33
	Ebrary	364
	EBSCO	501
	IEEE Xplore	226
	InfoSci-Books	225
	Safari	114
	ScienceDirect	91
	Springer	604
	Wiley	107
Vendor platforms grouped as "Other" for analysis.	ABC-CLIO	3
	Access Engineering Library	1
	ACLS Humanities e-Book	1
	American Chemical Society	1
	AMS eBooks	1
	ASME Digital Collection	1
	Cambridge Books Online	13
	CRCnetBASE	13
	Credo Reference	5
	De Gruyter	14
	Gale Virtual Reference Library	8
	JSTOR	8
	Oxford	7
	Palgrave Connect	13
	Project Muse	21
	Royal Society of Chemistry	1
	World Scientific	4
Subtotal		**2380**
Vendor platforms with no ebook usage reports available. Excluded from analysis.	ACM Digital Library	7
	ARL Digital Publications	53
	DOAB	30
	EBL	5
	HathiTrust Digital Library	1
	Knovel	2
	Morgan & Claypool	42
	National Geographic Virtual Library	1
	OAPEN	11
	Other OA	34
	SAGE Research Methods	1
Subtotal		**187**
Total		**2567**

To enable analysis of usage over time, the student computed totals for each half year of usage reports for each title to aggregate fall and spring semester use (with summer split in half between them). She computed total uses by year according to length of time from publication: for each book she created a column for the total number of uses it received each year during its listed date of publication (Y1), the following year (Y2), and so on through eleven years, reflecting titles from 2006 to 2016. Because there were five years of usage reports and eleven years of titles, some titles had records only for more distant years from publication and some had only records for their first year or few years from publication. As a final step before analysis, the researcher cleaned the data set using OpenRefine to remove inconsistencies in metadata fields with fixed values, including minor variations in capitalization and more substantial variations in naming of individual vendor platforms across different catalog records.

The resulting data set included 2,567 e-books (with duplicate titles from different vendors counted distinctly). Some books had no usage data available either because they were open access titles or because the vendor did not provide usable usage reports. For example, Morgan & Claypool's Synthesis Lectures e-book series include reports in the COUNTER Journal Report 1 format, which aggregates all titles into a single line of reporting for each series, instead of Book Report 1. Titles from vendors with no available data were removed from the data set for analysis, resulting in a final data set of 2,380 e-books (a reduction of 7.28 percent). Table 2 shows the number of titles for each vendor, distinguishing those vendors included and excluded from final analysis.

The removal showed some impact on overall makeup of the final dataset available for analysis: "Professional" audience level texts shrank by 10.1 percent, twice the rate of other audience levels; among genres, "Reports" were almost eliminated, shrinking by 92.5 percent (and thus regrouped with the "Other" category for genre analysis); and "Monographs" also shrank by 10.0 percent. The class ranges that were disproportionately reduced were AZ (17.2

percent), CD (9.1 percent), Z (11.7 percent), and ZA (18.3 percent).

Descriptive statistics for usage across the different fields captured in the data set were calculated in Excel. Like previous studies, the initial analysis divided titles into those with use and those with no use to minimize conflict between different norms of reporting by vendors and across report types. However, after conferring with the campus data consulting service, this study explored two variations on this idea to attempt to recapture the utility of counts of uses of individual e-book use. First, titles were divided into categories based on those that received zero, one, two to ten, or more than ten uses in a given time period. This method captures extent of use while reducing the importance of specific numbers, although comparison of BR1 and BR2 reports remains problematic in this scheme due to the naturally higher numbers of sections downloaded (BR2) versus downloads of entire books (BR1). Second, to resolve this problem, for each vendor included individually in the data set (i.e., not included in "Other"), titles in the top quartile of used titles for each vendor were identified. The data set indicates whether a given title is in the top 25 percent of used titles from that vendor used by patrons for each given period in a given report type. This method enables comparison of titles from different report types and focuses not on the titles with the greatest raw number of uses but those that are the most used on individual platforms. However, it requires excluding titles from some vendors entirely and some vendors for particular time periods when the library owned such a low number of titles as to be unable to form quartile ranges. For convenience, further explanation of how the top quartile titles were analyzed is provided with discussion of those titles in the "Analysis" section of this paper.

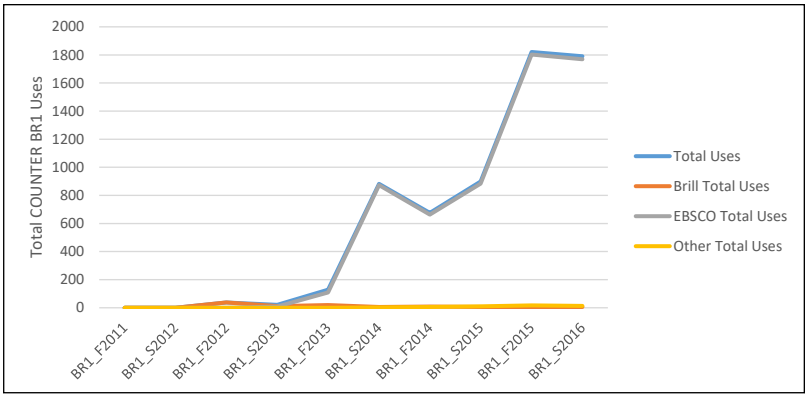

Figure 1. Total Uses by Half Year by Vendor, Book Report 1

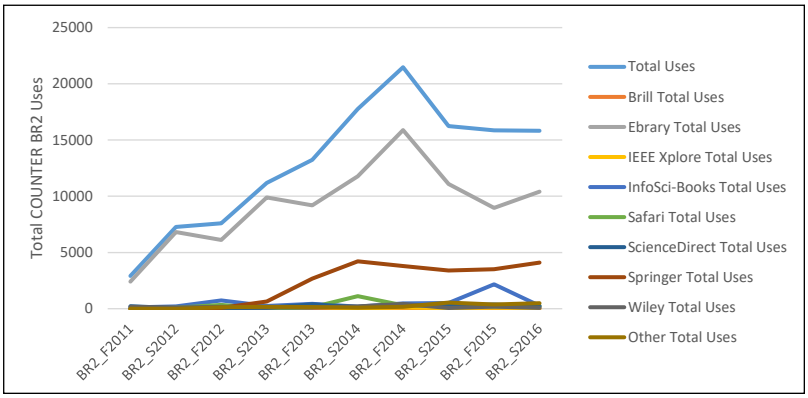

Figure 2. Total Uses by Half Year by Vendor, Book Report 2

Analysis

Figures 1 and 2 show the raw totals for use for BR1 and BR2, respectively, across each half-year period by vendor platform. Raw totals from COUNTER reports are of limited use because of reporting variations, especially across report types, and the remainder of this paper generally ignores them or processes them further for analysis; however, these figures demonstrate several factors reflecting local collections practice and use and raise some questions. First, they show a growth of overall use over time followed by a plateau. The plateau in BR2 usage counts tracks closely with a plateau in ebrary usage counts and a rise in BR1 reports for EBSCO: this reflects a shift in title-by-title e-book collections strategy from the ebrary to the EBSCO platform for LIS titles where the two compete against each other and there are no superior platform options (which is true in a large number of cases for LIS). Thus, for more recent years, the new title-by-title selections have mostly occurred in the EBSCO platform. However, EBSCO usage also plateaus at the end of the period and raises the question of whether e-book usage has topped off for a student and faculty population that has grown accustomed to this format. A spike in BR1 for spring 2014 is partly due to a steep increase in the number of EBSCO titles used, but also due to three textbooks used intensely that semester, two of which subsequently dropped off in use; similarly, a spike in BR2 for fall 2014 is due to a handful of titles in ebrary that were either textbooks, handbooks, or essay collections likely to have chapters used in various courses. Second, the difference in scale for BR1 versus BR2 illustrates the impact of downloads by entire book versus downloads by section on usage reports, and why comparison across these

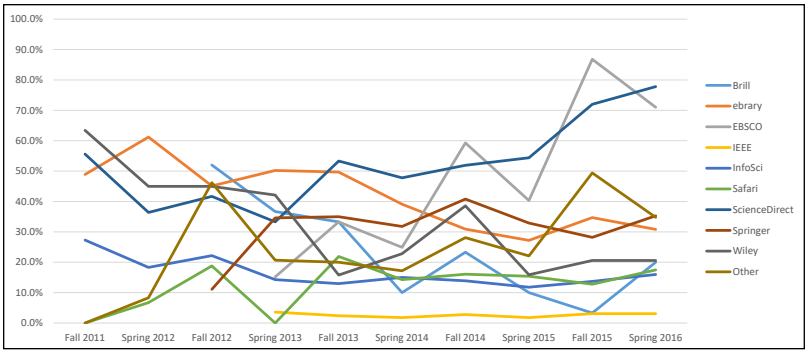

Figure 3. Percent of Titles Used by Half Year, by Vendor

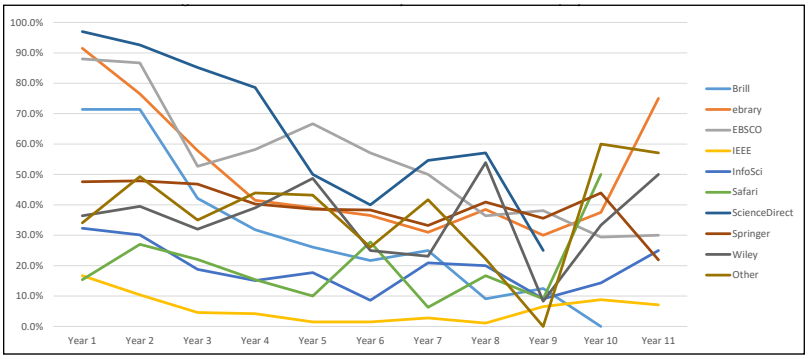

Figure 4. Percent of Titles Used by Year from Publication, by Vendor

report types requires an approach that negates the impact of such variation. In spring 2016, the library owned 500 LIS e-books in EBSCO, 71 percent of which were used in that period, compared to 364 in ebrary, only 31 percent of which were used, yet EBSCO e-book aggregate uses total less than a fifth of ebrary's total. Because the titles in these collections tend to be comparable and EBSCO has the more recent titles, the effect here is reasonably assumed to be a product of different counting mechanisms and book report types despite the fact that the two platforms are extremely similar in terms of user experience and functionality of downloading.

Analysis of Use Versus Non-Use

For the purpose of reporting the analysis in this section, figures 3–11 are used to visually communicate trends in use over time. Tables showing the raw counts and percentages underlying these figures may be found in appendix A.

The pattern of usage by vendor semester-by-semester and by time from publication, as shown in figures 3 and 4, respectively, shows other trends. Figure 3 shows that, as the total number of e-books has grown, the percentage of titles used has remained similar or slightly declined for most publishers. This pattern fits with growing collection size and a relatively stable number of users. The exceptions are EBSCO's significant increase in recent years due to the increase in new title-by-title purchases from that platform, and ScienceDirect's rise in recent years, likely tied to Elsevier's acquisition of Chandos, which provides a significant LIS book series. However, another pattern is a greater percentage of titles from most vendors regularly being used in the fall than in the spring. This suggests a usage cycle for e-books tied to the academic year.

Figure 4 shows percentage of titles used in their initial year of publication and in subsequent years. It reveals an overall decline in percentage of titles used as they age. Notably, an extremely high percentage of title-by-title purchases are used in their first two years of publication from the two primary vendors for such purchases in LIS, ebrary, and EBSCO, and, to a lesser extent, with Brill. Titles from one e-book bundle, ScienceDirect, perform especially well in this period (although the number of LIS titles in this collection is much smaller than ebrary or EBSCO, and numbers for ScienceDirect may be inflated due to missing reports for some titles that are difficult to interpret since ScienceDirect provides zero-use titles in their reports). Titles from another e-book bundle, Springer, shows about half of LIS-related titles used in their first year (if the missing ScienceDirect titles are counted as zeros, it also runs at about half of titles used). Looking at the year of publication, the percentage of e-books owned and used in their first year has grown substantially from 46 percent (for 2012 titles) to 79 percent (for 2016 titles). In general, e-books in LIS show surprising staying power, with over 27.6 percent of all titles owned continuing to be used as far as eleven years after publication. This provides a very different picture of LIS e-book use than previous studies and demonstrates little evidence of problems with marketing and awareness of e-books that others have considered as the source low usage statistics in prior studies.

Analysis of particular categories of texts reveal varying degrees of usefulness in breakdown. Figures 5 and 6 show the percentage of titles used over time as broken down by the audience level for the text. Patterns regardless of audience level track closely with one another: significant fluctuation for earlier half year periods for "Other" (Basic and Popular) titles, and for later years from publication date for General Academic and Other titles, likely derive from the small number of overall titles owned in those periods. The most useful finding from this breakdown is that titles with a professional audience do fairly well and continue to be

used after initial publication at rates as strong or stronger than other titles besides those for a general academic audience. This fact validates the collection of these titles, which is somewhat more common for LIS than other subject areas in the library due to collecting for a professional degree program. However, the longevity of this content is unexpected since it is likely to become outdated faster: books in this category often include those on topics such as implementing particular technologies in libraries, museums, and archives, and newer books quickly replace older ones as technology changes.

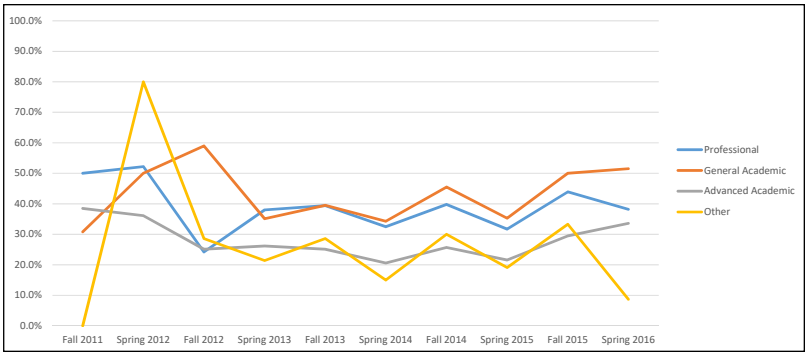

Figure 5. Percent of Titles Used by Half Year, by Audience

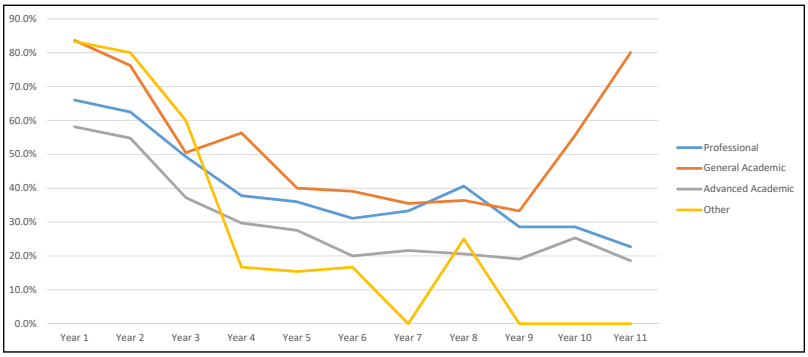

Figure 6. Percent of Titles Used by Year from Publications, by Audience

Breakdown of use versus non-use for different genres of book, as shown in figures 7 and 8, reveals steady patterns for most types of texts. Notably, monographs, conference proceedings, and essay collections (either edited collections or collections by one author) demonstrate very similar levels of use not just on a semester-by-semester basis but by year from publication, except as collections begin to outpace monographs in terms of percent of titles used in later years. Monographs do not behave differently from collections by this metric until their slightly lower use in later years. More surprisingly, a larger percentage of textbook titles are used on a semester-by-semester basis and perform well over the medium term in length from publication. Individual textbooks would have expected heavy use, but if textbook use were purely driven by course selection, it would not be likely for a large percentage of all textbooks to be used versus other genres. Handbooks, guides, and technical manuals (HGT) perform similarly to textbooks in the years immediately following publication and then follow the pattern for monographs, collections, and proceedings. Bibliographies also perform very strongly, although a relatively small part of the collection. Even though the LCC's Z class range used for selection of e-books in this study excluded the "bibliographies" subrange, many appeared from other class ranges. These are generally reader's advisory titles, often but not exclusively for young adult readers, rather than research bibliographies. However, when students can acquire such information through licensed tools like NoveList or freely online through sites like Wikipedia or Goodreads, the broad use of these titles is surprising. Other reference titles (dictionaries, biographies, and directories) and encyclopedias perform most strongly; in the case of encyclopedias, this is not surprising, but the other reference types include sources most often considered to be made irrelevant by the internet. Like bibliographies, these perform better than expected.

Breaking down use versus non-use over time by LC class range, as shown in figure 9, demonstrates growth in interest semester-over-semester related to some specific content areas. These include AM (museums), AZ (largely for this collection digital humanities), CD (archives), K (law, in this collection primarily as related to technological privacy and copyright), P (literature, in this collection primarily related to history of children's literature and some history of the book and reading), and HM (social sciences studies information). The growth in the percent of titles used in AM, AZ, CD, K, and P areas are similar in that these are relatively small groups overall, suggesting a demand for greater content in specific areas, but it is not clear if the percent of titles used would remain as high if the number of titles increased substantially. The HM class is a medium-sized subset of texts and reveals increasing demand even within a larger subcollection.

Analysis of use by class range since time of publication, as shown in figure 10, reveals that T (technology) titles already used at lower rates, receive the least use over time. Titles in the HD range (largely here related to information management) perform on a similar trajectory. The results indicate some possible limitations of using the broadest LC classes to break down disciplinary behavior as has often been done in prior studies. For example, HM titles perform much more strongly semester-by-semester and by length of time from publication than either HC or HD titles: the "H"

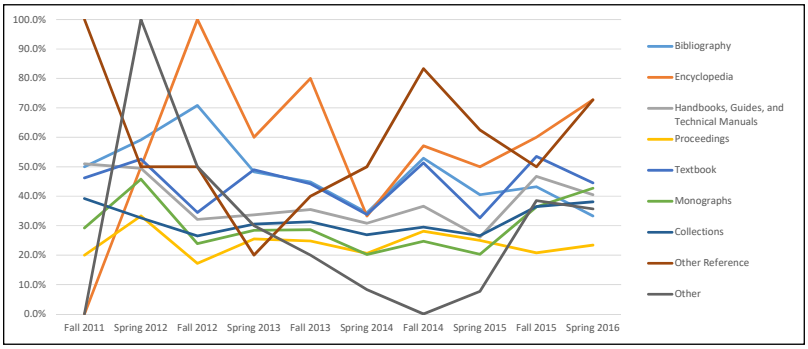

Figure 7. Percent of Titles Used by Half Year, by Genre

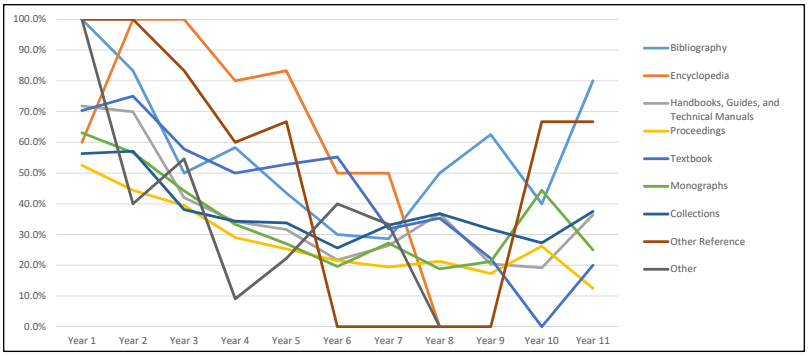

Figure 8. Percent of Titles Used by Year from Publication, by Genre

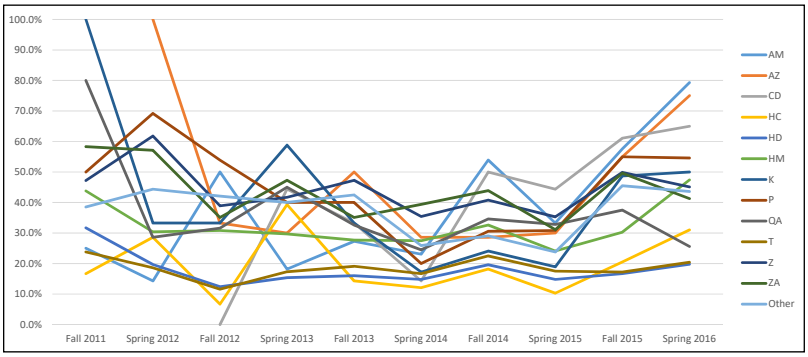

Figure 9. Percent of Titles Used by Half Year, by LC Class Range

class is diverse and includes what are really fairly distinct types of disciplinary production and consumption. The more traditionally identified LIS areas, Z and ZA, receive different usage, especially in their first year. Z in particular may merit further breakdown since it includes sub-ranges that are driven more by humanistic methods (such as history of the book and history and practice of publishing) and those that focus on areas related to management and operations of libraries.

Finally, when considering publication year, it is clear that e-book use in general has become much more commonplace among users working in these areas (see figure 11). For titles with a 2012 publication date, 46 percent were used in their first year and 57.1 percent in their second year. For titles with a 2015 publication date, by contrast, 69.9 percent were used in their first year and 72.5 percent in the second year. For 2016 titles, the percent used in their first year grew to 79 percent (with no data available for the second year). It is important to note that the 2016 number is likely low because usage statistics were available only for the first half of the year for this study, greater amounts of use happen in the fall (as noted earlier), and a relatively small number of new titles are acquired in fall verses spring due to collection development patterns.

Analysis by Classification of Level of Use

Classifying levels of use into bins of zero uses, one use, two to ten uses, and more than ten uses shows some similar patterns with additional nuances and some departures. Due to differences in counting, analysis of BR1 and BR2 must be separated for this analysis. However, because of the relatively small number of publishers using COUNTER BR1, those books are examined here in general and not in the category breakdowns.

Figure 12 shows the overall breakdown of usage classifications over time from publication for BR1 and BR2. A noticeable pattern is that the percentage of titles used only once or those used two to ten times both shrink faster than the percentage of the titles used most frequently (over ten times). This is particularly true for the BR1 titles, although likely made more dramatic by the focus on title-by-title purchasing in EBSCO for the most recent years. This persistence of the most highly used category seems likely related to course adoption of individual chapters or entire books, even if the title is not a textbook.

Figure 13 shows patterns in use over time for different audience levels for publishers using Book Report 2: Professional, General Academic, and Advanced Academic. Advanced Academic titles, the most numerous, closely track the general pattern for BR2 titles. Like the general analysis of use versus non-use, this breakdown shows more longevity of professional titles, particularly in the highest use category, than expected. However, General Academic titles show the most longevity in terms of whether titles are used plus in terms of titles in the top two usage categories. This pattern

for generalist titles may draw from a relatively small number of titles compared to the other groups, but it also makes intuitive sense for these more accessible titles to receive greater use than more specialized titles. Not visualized here are the "Other" titles, for "Basic" or "Popular" audience levels, which are very small in number but also see nearly all of their use in their first year of publication.

Figure 14 shows patterns in use over time for five genres with a substantial number of titles: Monographs, Collections, Proceedings, Textbooks, and Handbooks, Guides, and Technical Manuals. Notably, while monographs, proceedings, and collections appeared to behave very similarly when looking purely at use versus non-use, collections in particular distinguish themselves from the other two with greater percentages of titles used more than ten times initially and in later years after publication. Beyond those three genres, handbooks, guides, and technical manuals are used even more at the highest level over the long term. Textbooks have the highest percentages over time of titles used over ten times and between two to ten times. This may seem expected, since any textbooks used by courses would receive extensive use, but the overall large percentage used between two to ten times suggests, like the persistence of a large percent of textbooks used overall, that many of these titles are used by students as reference texts outside of particular course contexts.

Figure 15 shows patterns in use over time from publication broken down by LC class ranges for the six ranges with a substantial number of titles: HD, HM, QA, T, Z, and ZA. Class ranges HD and T behave most similarly to the overall collection, shrinking most in overall percentage of titles that are used, although with less overall "high" use at all points from publication than other class ranges. HM titles persist with slightly stronger use and over the medium term the percentage of titles with two to ten uses maintains itself more steadily than the other categories, which might be expected from longer term research use of books in the social sciences (here studies of information in society). However, the strongest areas of use are the core library and information science class ranges Z and ZA. What is impressive in Z is that up to 20 percent of these titles are used more than ten times a year over even the medium to long-term. The QA range behaves the most erratically in terms of the percentages of titles being used at high or moderate levels over time, and it is not clear what is driving such variation except perhaps the relatively low number of titles overall combined with irregular course adoptions or spurts in research activity, or both.

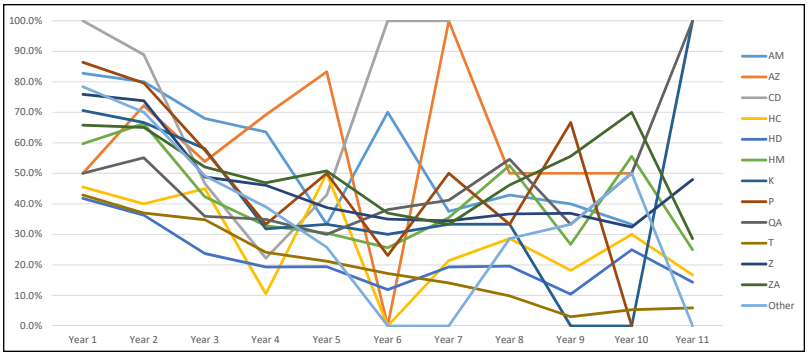

Figure 10. Percent of Titles Used by Year from Publication, by LC Class Range

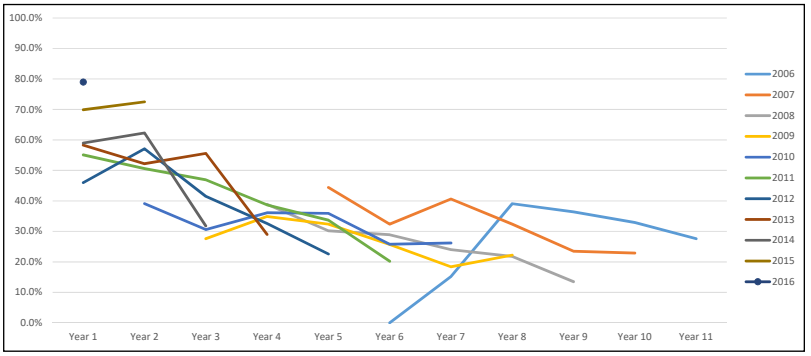

Figure 11. Percent of Titles Used by Year from Publication, by Publication Year

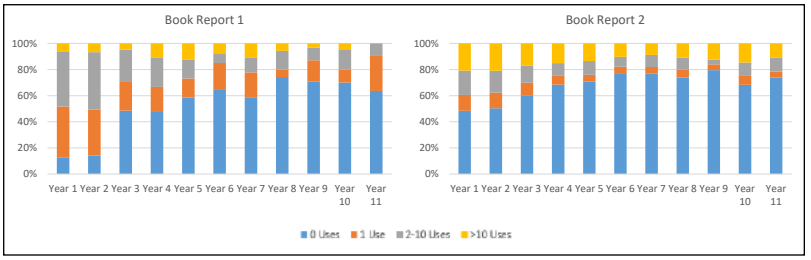

Figure 12. Use Class by Year from Publication, by Book Report Type

Analysis of Top Quartile Titles

Titles identified as being in the top quartile of used titles for each publisher were analyzed by audience, genre, and class range to determine which categories overperformed as heavily used titles relative to their size in the collection overall. For each category within a particular breakdown, the total number of top-quartile titles was determined, plus the percentage of titles of the total top quartile titles that category represented. The total number of titles in the category

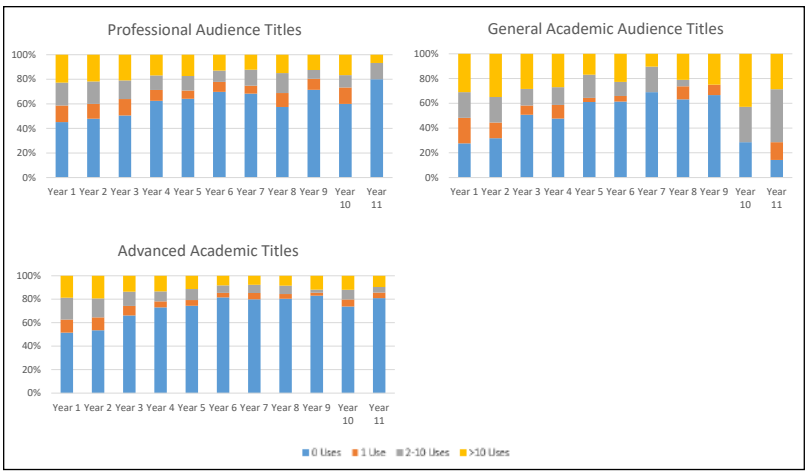

Figure 13. Use Class by Year from Publication, by Audience

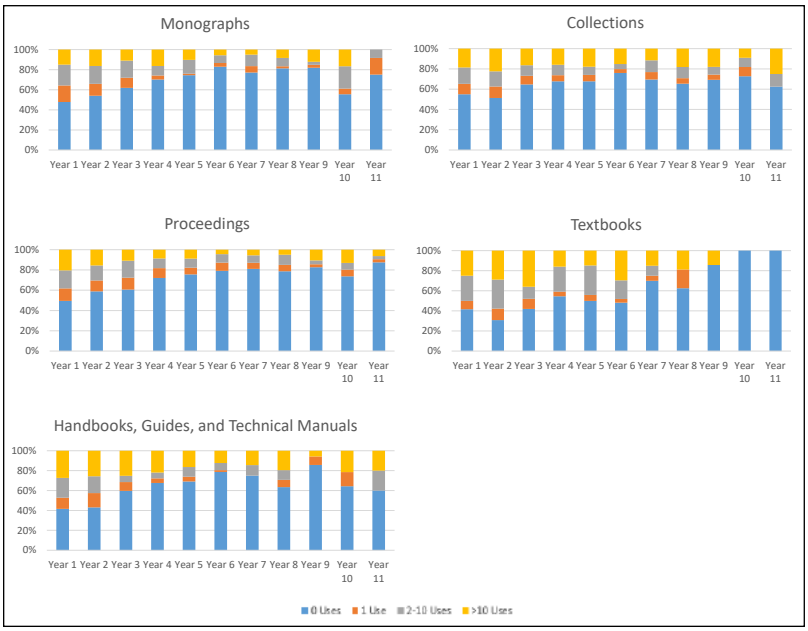

Figure 14. Use Class by Year from Publication, by Genre

The breakdown by audience shows the strongest performance by general academic books. While they are more likely to show use, titles aimed at a professional audience perform only slightly ahead of their presence in the collection. The exception to this pattern is over the medium term, which again shows greater longevity for at least a set of professional texts than might be expected. Advanced academic texts are less present in the top quartile texts than in the overall collection until later years after a drop-off in use of professional level texts. This rise of more specialized texts (those books with greater use of jargon and a narrower focus) over the long term matches the idea of the "long tail" of use, where, at a certain age, books are most likely to be used by those pursuing advanced research rather than for courses and general reference.

Examining the top quartile texts broken down by genre, Encyclopedias, and Other Reference (Dictionaries, Biographies, Directories) perform especially well in the first four years, although both have a relatively small number of texts overall. The steep drop-off afterwards to a total lack of those reference titles appearing in the top quartile texts appears to reflect that the key texts in the data set are more recent rather than a long-term lack of interest. Textbooks show a longer life of strong use than might be expected given the frequency with which publishers release new editions of these texts. Bibliography mostly performs very well, showing not just breadth of demand but strength of demand for these titles over a long period. Monographs and proceedings perform the least well, and monographs only perform ahead of their presence in the collection in the latest years of the collected data, whereas collections perform moderately well.

Broken down by class ranges, the top quartile titles show some flux in areas of strength from year to year. However, the classes T (technology), HC (economics of information), and HD (knowledge management and information management) do not perform well until the end of the period of the data collection, at which point a number of classes have no titles in the data set to compete. The classes AM (museums) and CD (archives) perform particularly well early on, and then more moderately well. The classes AZ (digital humanities) and P (literature) perform well in the medium term. Titles in the HM class (information in society) appear to grow in strength in representation in the top quartile. The core library-related classes, Z and to a

overall for the publishers included in this part of the analysis was calculated, with the percentages of titles it represented in the collection overall. Appendix B shows the statistics for these preliminary calculations. Finally, the percentage of titles the category had in the top quartile was divided by the percentage of titles in the collection, creating a relative usage index (table 3). Any values greater than one indicate overrepresentation among the most highly used titles, and any values less than one indicate underrepresentation among the top quartile titles (a zero indicates no titles in the category were in the top quartile in a given year; an "N/A" indicates no titles were owned in the category for that year).

lesser extent ZA, perform well over the entire lifecycle. Generally, the humanistic and social science related areas—AM, AZ, CD, HM, K, P—show strength across several years, showing not just uses of a large percent of these titles but also a depth of use for them as well.

Discussion

This study shows a much stronger performance of LIS e-book titles than has been noted in prior studies, which show them performing somewhere between slightly ahead of average or poorly compared to other areas of collections. About 60 percent of LIS titles are used in each of their first and second year of publication, and that amount increases substantially year-by-year, with almost 80 percent of new 2016 titles used in their first year. Over 27 percent are still used eleven years after publication, and 20 percent of Z titles are used more than ten times a year in the last years of the data set—a greater proportion of Z titles than were used at all in the early study by Sprague and Hunter. Greater LIS e-book use than other studies may be due to the local institutional context: a large iSchool with a major program in library and information science means significantly more course uptake and research uses, and requirements for research and publication for library faculty in addition to iSchool faculty may make for more active librarian book users. Most of the areas outside of Z and ZA are part of LIS collections but in practice include research areas split among departments that may have more varied uptake of e-books as opposed to the longer term of collection of e-books in LIS that may have created an earlier shift. However, the performance of humanistic and humanistic social science areas in this study (AM, AZ, CD, HM, K, and P) suggest that certain fields in these disciplines are more likely to adopt e-books than has been apparent in some other studies and may even be fairly underserved either in purchasing patterns or content availability.

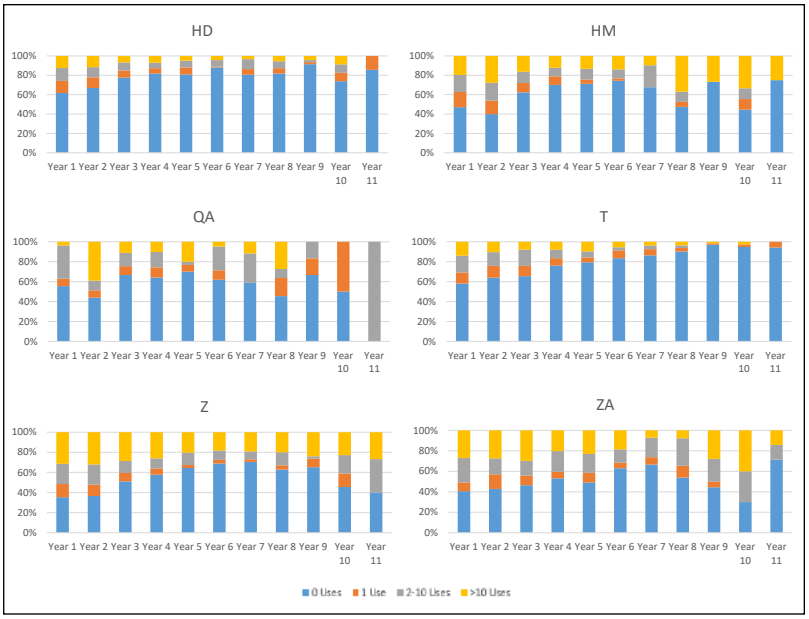

Figure 15. Use Class by Year from Publication, Library of Congress Class Range

Regarding audience breakdown, professional-level titles performed better than anticipated over the medium term, although not as strongly as general academic titles. Advanced academic titles were the most common audience level but performed the weakest year-by-year, but this is expected for titles that would have more targeted research audiences, and their stronger presence in the top quartile titles in the latest years of the study indicate the stronger research-focused use of older collections as opposed to teaching and reference uses.

The study shows several differences among the performance of various genres, with encyclopedias and other reference texts not surprisingly doing well both in terms of numbers of books used and the extent to which they are used, although they are a relatively small number compared to other groups. More interesting is the strong showing among bibliographies, which also over-perform among the top quartile of used books in many years post-publication. One question arising from this study is whether the strong performance of bibliographies is true of LIS specifically (due to the prevalence of reader's advisory bibliographies and their likely use for course projects) or true more broadly. Many individual textbooks are used extensively, but this study also shows broad use of a large number of textbooks and use in moderate amounts of two to ten uses in a year which suggests these volumes are used for more than just assigned course readings. This study shows greater differences in performance by monographs and collections than that shown previously by Freeman and Saunders who described slightly more pages and passages read in collections than monographs. LIS collections and monographs show similar proportions of titles with access in early years followed by heavier use of collections, but moreover, collections are over-represented in the top quartile of used titles for almost the entirety of time from publication studied here, where monographs are under-represented until ten years after publication.

The fact that LIS cuts across many different areas of LCC allows some reflection on relevance of this study to further work in the study of e-books since class ranges are typically used for disciplinary breakdowns in other research. The difference of the HM subclass range from HC and HD (both more related to economics and business) in this study,

Table 3: Top Quartile Relative Usage Index by Category*

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Audience											
Professional	1.0271	1.0017	1.1480	1.0994	1.3563	1.3603	1.1953	0.7532	0.8248	0.7500	0.0000
General Academic	1.6151	1.8539	1.2568	1.6233	1.7087	1.6172	1.6300	1.0043	1.6496	3.0000	4.0000
Advanced Academic	0.9230	0.8974	0.8867	0.9029	0.7810	0.8068	0.8947	1.2256	1.0521	0.9800	1.2000
Other	0.9184	0.6393	1.3857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Genre											
Bibliography	1.0019	1.2294	0.7506	2.3087	1.3105	2.0485	1.9405	0.0000	2.1209	2.1000	2.6667
Encyclopedia	3.3063	3.6530	6.7553	5.7717	0.0000	0.0000	0.0000	N/A	N/A	N/A	N/A
Handbooks, Guides, and Technical Manuals	1.2644	1.0559	1.2661	1.2051	1.3550	0.6510	1.2511	0.8070	1.0239	0.8077	0.0000
Proceedings	0.8793	0.7444	0.7642	0.8750	0.9177	0.6905	0.6318	1.0184	0.8733	0.7000	0.4211
Textbooks	1.2142	1.7047	2.0886	1.6161	1.0671	2.7435	1.5093	1.1298	0.0000	0.0000	0.0000
Other Reference	1.8368	2.1309	3.0023	2.3087	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	N/A
Other	2.7552	0.0000	1.1259	0.0000	0.0000	3.0727	0.0000	0.0000	N/A	N/A	N/A
Monographs	0.7749	0.8054	0.5774	0.7782	0.7661	0.6828	0.7056	0.5317	0.6186	2.1000	1.7778
Collections	0.8644	1.0708	1.0149	0.8912	1.0477	1.5364	1.7912	1.6601	1.8558	1.4000	2.6667
Class											
AM	2.1648	1.3699	0.7832	1.1543	1.3833	0.0000	0.0000	1.5064	4.9487	0.0000	N/A
AZ	0.6123	1.2785	1.6376	1.0494	0.0000	N/A	6.7917	N/A	0.0000	10.5000	N/A
CD	2.5047	1.0654	1.2009	0.0000	0.0000	0.0000	0.0000	N/A	N/A	N/A	N/A
HC	0.5009	0.5114	0.4504	0.0000	0.0000	0.0000	0.9702	0.0000	3.7115	1.3125	0.0000
HD	0.6209	0.5047	0.4895	0.4036	0.3532	0.2604	0.3396	0.4017	0.5499	1.0500	1.0000
HM	0.9184	1.3699	1.5441	0.7696	1.1066	1.4632	1.8736	3.3894	1.2372	1.5000	2.6667
K	1.8368	0.7376	1.2282	0.0000	3.1123	0.0000	4.5278	0.0000	0.0000	0.0000	N/A
P	1.1021	1.4752	1.5529	1.8470	0.6552	0.0000	0.0000	0.0000	0.0000	0.0000	N/A
QA	0.3674	1.3318	0.7206	0.8446	2.1464	0.7682	1.8111	3.8736	0.0000	0.0000	N/A
T	0.4984	0.4319	0.5382	0.6113	0.6061	0.7717	0.4299	0.4108	0.0000	0.0000	1.0000
Z	1.3047	1.4102	1.4550	1.7514	1.4743	1.7071	1.9718	1.1298	1.7466	1.3125	0.8000
ZA	0.9058	1.1623	1.4685	1.3151	1.5809	2.2761	0.6626	0.9038	1.8558	2.1000	1.6000
Other	1.3177	0.7991	0.6551	1.1839	1.7785	0.0000	0.0000	1.5064	0.0000	5.2500	0.0000

*Index scores derived by dividing the percentage of titles within a category falling into the top quartile of used books for their respective publishers by the percentage of that category represented in the collection overall. For preliminary percentages, see Appendix B, tables B1 and B2. N/A indicates that insufficient titles existed to form quartiles for the category in a particular year. Darker blue cells indicate categories that were most over-represented among top-quartile titles in a given year. Darker yellow tiles indicate categories that were most under-represented in the top-quartile titles.

for example, shows that the "social sciences" class may not behave uniformly, and this could apply to other ranges. The most nuanced breakdown of disciplines in LC ranges in a larger cross-collection study of e-book use to date has been Knowlton's, which provides for thirty-two disciplinary areas with LC class ranges broken out and recombined accordingly.[21] The primary distinction lacking in his schema that would be useful from the perspective of the present study would be to separate out the part of the Z class range related to bibliographies for other areas rather than conflating it with librarianship. Nonetheless, as a caveat to this study it is worth remembering that these disciplinary breakdowns are not complete: history in particular can be found spread out well beyond the primary history class ranges.

Finally, it is worth noting that the use of newly published titles in this study shows the percentage of titles accessed in their first two years rising dramatically. It may be that this pattern stabilizes and plateaus before reaching 100 percent, but it raises the point that as e-book use becomes common among a variety of disciplines and levels off, examinations of usage statistics limited to use versus non-use will likely lose their ability to provide insight into user behavior. This lost utility will result because e-book use will be so ubiquitous that almost every title will be used, or because there will no longer be any significant changes in disciplinary comparisons, or both. Beyond understanding what disciplines are adopting e-books, it may become more useful to examine more popular topical areas or categories of text in particular fields. Use versus nonuse is the easiest way to make use of the limited nature of usage statistics, but further work will need to provide novel ways of using these statistics. It would help improve this situation dramatically if COUNTER would push for more consistency in implementation of usage statistics standards across vendors.

Conclusion

This study shows robust local adoption of e-books in library and information science, both in terms of the percentage of

titles accessed and the longevity and depth of use of titles. E-books appear to make for a larger "long tail" of academic use plus their greater use in early years. There are stark differences and surprises among genres and class ranges. Among genres, textbooks show breadth and depth of use that imply broad use outside of the relatively small number adopted for courses. Bibliography also performs well, which may be particular to library and information science due to use of reader's advisory titles in coursework and deserves further investigation. The strong performance of humanistic class ranges suggests the areas explored in this study may be underserved presently.

Introducing additional categories of analysis beyond class is one way that this study sought to expand what is possible with e-books. Further work that may be useful would be to examine intersections of factors, particularly the intersection of genre with class ranges, especially in areas of relatively low e-book use as in the HC, HD, and T classes here, where identifying any patterns across the titles that are used versus those that are not would be helpful.

Additional investigation of how to make use of COUNTER usage data beyond the used versus unused distinction is needed as e-books become more common in academic libraries and questions about collections use shift away from the question of whether individual disciplines are adopting e-books. More uniform implementation of the COUNTER standard would be useful, as would more transparency from publishers as to their individual implementations.

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Appendix A

This appendix includes tables of summary descriptive statistics underlying figures 3–11 in the text. They show trends over time by calendar half year (e.g., January–June 2015) or by year from publication of titles (with Year 1 as the year of publication).

Table A1: Percent of Titles Used by Half Year, by Vendor

Vendor	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
Brill	N/A	N/A	52.0% (13/25)	36.7% (11/30)	33.3% (10/30)	10% (3/30)	23.3% (7/30)	10.0% (3/30)	3.3% (1/30)	20.0% (6/30)
ebrary	48.9% (46/94)	61.2% (112/183)	45.1% (83/184)	50.2% (154/307)	49.7% (154/310)	39.1% (129/330)	30.9% (101/327)	27.2% (93/342)	34.7% (119/343)	30.8% (112/364)
EBSCO	N/A	N/A	N/A	15.2% (5/33)	33.3% (11/33)	24.9% (43/173)	59.3% (108/182)	40.3% (124/308)	86.8% (275/317)	71.0% (355/500)
IEEE	N/A	N/A	N/A	3.6% (6/169)	2.4% (4/169)	1.8% (4/214)	2.8% (6/218)	1.8% (4/226)	3.1% (7/226)	3.1% (7/226)
InfoSci	27.3% (15/55)	18.3% (19/104)	22.2% (24/108)	14.3% (22/154)	13.0% (20/154)	15.0% (29/193)	13.9% (27/194)	11.8% (25/212)	13.7% (29/212)	16.0% (36/225)
Safari	0.0% (0/9)	6.7% (1/15)	18.8% (3/16)	0.0% (0/29)	21.9% (7/32)	14.3% (8/56)	16.1% (9/56)	15.4% (12/78)	12.8% (10/78)	17.5% (20/114)
ScienceDirect	55.6% (5/9)	36.4% (4/11)	41.7% (5/12)	33.3% (5/15)	53.3% (8/15)	47.8% (11/23)	51.9% (14/27)	54.4% (25/46)	72.0% (36/50)	77.8% (28/36)
Springer	N/A	N/A	11.1% (29/261)	34.6% (140/405)	35.0% (144/411)	31.8% (156/491)	40.8% (202/495)	32.9% (186/565)	28.2% (160/568)	35.3% (213/604)
Wiley	63.4% (7/11)	45.0% (9/20)	45.0% (9/20)	42.1% (16/38)	15.8% (6/38)	22.8% (13/57)	38.6% (22/57)	15.9% (10/63)	20.6% (13/63)	20.6% (22/107)
Other	0.0% (0/1)	8.3% (1/12)	46.2% (6/13)	20.7% (6/29)	20.0% (6/30)	17.2% (11/64)	28.1% (18/64)	22.1% (19/86)	49.4% (43/87)	34.8% (40/115)

Table A2: Percent of Titles Used by Year from Publication, by Vendor

Vendor	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Brill	71.4% (5/7)	71.4% (10/14)	42.1% (8/19)	31.8% (7/22)	26.1% (6/23)	21.7% (5/23)	25.0% (4/16)	9.1% (1/11)	12.5% (1/8)	0.0% (0/2)	N/A
ebrary	91.5% (151/165)	76.5% (221/289)	57.8% (177/306)	41.5% (126/304)	39.0% (94/241)	36.5% (44/166)	31.0% (26/84)	38.5% (15/39)	30.0% (6/20)	37.5% (3/8)	75.0% (3/4)
EBSCO	88.0% (278/316)	86.7% (301/347)	52.7% (98/186)	58.2% (32/55)	66.7% (10/15)	57.1% (8/14)	50.0% (9/18)	36.4% (8/22)	38.1% (8/21)	29.4% (5/17)	30.0% (3/10)
IEEE	16.7% (1/6)	10.4% (5/48)	4.6% (4/88)	4.2% (5/118)	1.5% (2/134)	1.5% (2/133)	2.8% (3/107)	1.1% (1/95)	6.5% (4/62)	8.8% (3/34)	7.1% (1/14)
InfoSci	32.3% (51/158)	30.1% (59/193)	18.8% (34/181)	15.1% (22/146)	17.7% (18/102)	8.6% (7/81)	20.9% (9/43)	20.0% (3/15)	9.1% (1/11)	14.3% (1/7)	25.0% (1/4)
Safari	15.4% (8/52)	27.0% (17/63)	22.0% (13/59)	15.4% (6/39)	10.0% (3/30)	27.8% (5/18)	6.3% (1/16)	16.7% (2/12)	9.1% (1/11)	50.0% (2/4)	N/A
ScienceDirect	97.0% (32/33)	92.6% (25/27)	85.2% (23/27)	78.6% (11/14)	50.0% (5/10)	40.0% (4/10)	54.6% (6/11)	57.1% (4/7)	25.0% (1/4)	N/A	0.0% (0/1)
Springer	47.6% (140/294)	47.9% (180/376)	46.8% (170/363)	40.3% (130/323)	38.6% (103/267)	38.3% (85/222)	33.2% (61/184)	40.9% (52/127)	35.6% (32/90)	43.9% (25/57)	21.9% (7/32)
Wiley	36.4% (12/33)	39.5% (17/43)	32.0% (16/50)	39.0% (16/41)	48.7% (18/37)	25.0% (8/32)	23.1% (6/26)	53.9% (7/13)	8.3% (1/12)	33.3% (2/6)	50.0% (2/4)
Other	34.1% (15/44)	49.3% (33/67)	35.0% (21/60)	43.9% (18/41)	43.2% (16/37)	26.1% (6/23)	41.7% (5/12)	22.2% (2/9)	0.0% (0/6)	60.0% (3/5)	57.1% (4/7)

Table A3: Percent of Titles Used by Half Year, by Audience

Audience	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
Professional	50.0% (24/48)	52.2% (48/92)	24.2% (53/219)	38.0% (135/355)	39.4% (142/360)	32.5% (156/480)	39.8% (194/488)	31.7% (189/597)	43.9% (261/608)	38.2% (289/756)
General Academic	30.8% (4/13)	50.0% (16/32)	59.0% (23/39)	35.1% (26/74)	39.5% (30/76)	34.3% (34/99)	45.5% (46/101)	35.3% (47/133)	50.0% (67/134)	51.5% (85/165)
Advanced Academic	38.5% (45/117)	36.1% (78/216)	25.1% (94/374)	26.2% (201/767)	25.1% (194/773)	20.6% (214/1037)	25.7% (268/1042)	21.6% (261/1206)	29.5% (358/1212)	33.6% (463/1378)
Other	0.0% (0/1)	80.0% (4/5)	28.6% (2/7)	21.4% (3/14)	28.6% (4/14)	15.0% (3/20)	30.0% (6/20)	19.1% (4/21)	33.3% (7/21)	8.7% (2/23)

Table A4: Percent of Titles Used by Year from Publication, by Audience

Audience	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Professional	66.0% (266/403)	62.5% (307/491)	49.3% (204/414)	37.8% (129/341)	36.0% (94/261)	31.1% (60/193)	33.3% (45/135)	40.6% (39/96)	28.6% (20/70)	28.6% (12/42)	22.7% (5/22)
General Academic	83.6% (51/61)	76.2% (83/109)	50.5% (47/93)	56.3% (40/71)	40.0% (24/60)	39.1% (18/46)	35.5% (11/31)	36.4% (8/22)	33.3% (5/15)	55.6% (5/9)	80.0% (8/10)
Advanced Academic	58.1% (371/639)	54.8% (470/858)	37.2% (304/818)	29.7% (202/680)	27.6% (155/562)	20.0% (94/471)	21.6% (74/343)	20.6% (47/228)	19.1% (30/157)	25.3% (22/87)	18.6% (8/43)
Other	83.3% (5/6)	80.0% (8/10)	60.0% (9/15)	16.7% (2/12)	15.4% (2/13)	16.7% (2/12)	0.0% (0/8)	25.0% (1/4)	0.0% (0/3)	0.0% (0/2)	0.0% (0/1)

Table A5: Percent of Titles Used by Half Year, by Genre

Genre	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
Bibliography	50.0% (3/6)	59.1% (13/22)	70.8% (17/24)	48.3% (14/29)	44.8% (13/29)	34.4% (11/32)	52.9% (18/34)	40.5% (15/37)	43.2% (16/37)	33.3% (13/39)
Encyclopedia	0.0% (0/1)	50.0% (1/2)	100.0% (3/3)	60.0% (3/5)	80.0% (4/5)	33.3% (2/6)	57.1% (4/7)	50.0% (5/10)	60.0% (6/10)	72.7% (8/11)
Handbooks, Guides, and Technical Manuals	51.0% (25/49)	49.5% (47/95)	32.1% (36/112)	33.7% (67/199)	35.5% (72/203)	30.8% (89/289)	36.6% (107/292)	26.1% (102/391)	46.7% (185/396)	40.5% (218/538)
Proceedings	20.0% (2/10)	33.3% (5/15)	17.2% (32/186)	25.5% (109/428)	24.8% (107/432)	20.6% (109/529)	28.1% (149/531)	25.0% (143/573)	20.8% (120/578)	23.4% (144/616)
Textbook	46.2% (6/13)	52.6% (10/19)	34.5% (10/29)	49.0% (25/51)	44.2% (23/52)	33.8% (26/77)	51.3% (41/80)	32.65% (32/98)	53.5% (53/99)	44.5% (53/119)
Monographs	29.2% (7/24)	45.8% (22/48)	23.9% (22/92)	28.4% (55/194)	28.6% (56/196)	20.2% (55/273)	24.7% (68/275)	20.3% (71/350)	36.4% (129/354)	42.7% (177/415)
Collections	39.2% (29/74)	32.6% (46/141)	26.5% (50/189)	30.5% (88/289)	31.3% (91/291)	26.9% (111/412)	29.5% (122/414)	26.6% (127/477)	36.5% (175/480)	38.1% (213/559)
Other Reference	100.0% (1/1)	50.0% (1/2)	50.0% (1/2)	20.0% (1/5)	40.0% (2/5)	50.0% (3/6)	83.3% (5/6)	62.5% (5/8)	50.0% (4/8)	72.7% (8/11)
Other	0.0% (0/1)	100.0% (1/1)	50.0% (1/2)	30.0% (3/10)	20.0% (2/10)	8.3% (1/12)	0.0% (0/12)	7.7% (1/13)	38.5% (5/13)	35.7% (5/14)

Table A6: Percent of Titles Used by Year from Publication, by Genre

Genre	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Bibliography	100.0% (11/11)	83.3% (25/3)	50.0% (14/28)	58.3% (14/24)	43.5% (10/23)	30.0% (6/20)	28.6% (2/7)	50.0% (4/8)	62.5% (5/8)	40.0% (2/5)	80.0% (4/5)
Encyclopedia	60.0% (3/5)	100.0% (7/7)	100.0% (4/4)	80.0% (4/5)	83.3% (5/6)	50.0% (3/6)	50.0% (1/2)	0.0% (0/1)	N/A	N/A	N/A
Handbooks, Guides, and Technical Manuals	71.8% (214/298)	69.9% (237/339)	42.0% (107/255)	34.2% (64/187)	31.6% (48/152)	21.7% (26/120)	26.4% (23/87)	36.8% (21/57)	20.4% (10/49)	19.2% (5/26)	36.4% (4/11)
Proceedings	52.5% (104/198)	44.4% (134/302)	39.4% (133/338)	29.0% (101/348)	25.3% (80/316)	21.5% (59/274)	19.4% (42/217)	21.3% (34/160)	17.3% (18/104)	26.2% (16/61)	12.5% (4/32)
Textbook	70.3% (45/64)	75.0% (60/80)	57.8% (41/71)	50.0% (26/52)	52.8% (19/36)	55.2% (16/29)	31.8% (7/22)	35.3% (6/17)	22.2% (2/9)	0.0% (0/5)	20.0% (1/5)
Monographs	63.1% (128/203)	56.6% (154/272)	44.2% (110/249)	33.3% (63/189)	27.0% (38/141)	19.6% (21/107)	27.2% (22/81)	18.8% (9/48)	21.2% (7/33)	44.4% (8/18)	25.0% (3/12)
Collections	56.3% (183/325)	57.1% (241/422)	38.1% (144/378)	34.3% (97/283)	33.8% (71/210)	25.6% (41/160)	33.0% (32/97)	36.8% (21/57)	31.7% (13/41)	27.3% (6/22)	37.5% (3/8)
Other Reference	100.0% (3/3)	100.0% (6/6)	83.3% (5/6)	60.0% (3/5)	66.7% (3/5)	0.0% (0/1)	0.0% (0/1)	0.0% (0/1)	0.0% (0/1)	66.7% (2/3)	66.7% (2/3)
Other	100.0% (2/2)	40.0% (4/10)	54.6% (6/11)	9.1% (1/11)	22.2% (2/9)	40.0% (2/5)	33.3% (1/3)	0.0% (0/1)	N/A	N/A	N/A

Table A7: Percent of Titles Used by Half Year, by LC Class Range

LC Range	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
AM	25.0% (1/4)	14.3% (1/7)	50.0% (5/10)	18.2% (2/11)	27.3% (3/11)	23.1% (6/26)	53.9% (14/26)	33.3% (11/33)	57.6% (19/33)	79.3% (42/53)
AZ	N/A	100.0% (1/1)	33.3% (1/3)	30.0% (3/10)	50.0% (5/10)	28.6% (4/14)	28.6% (4/14)	30.0% (6/20)	55.0% (11/20)	75.0% (18/24)
CD	N/A	N/A	0.0% (0/1)	44.4% (4/9)	33.3% (3/9)	14.3% (2/14)	50.0% (7/14)	44.4% (8/18)	61.1% (11/18)	65.0% (13/20)
HC	16.7% (1/6)	28.6% (2/7)	6.7% (1/15)	39.3% (11/28)	14.3% (4/28)	12.1% (4/33)	18.2% (6/33)	10.3% (4/39)	20.5% (8/39)	31.0% (13/42)
HD	31.7% (13/41)	19.7% (14/71)	12.4% (13/105)	15.4% (27/175)	16.0% (28/175)	14.8% (34/230)	19.6% (45/230)	14.8% (39/264)	16.7% (44/264)	19.8% (68/344)
HM	43.8% (7/16)	30.4% (7/23)	30.8% (12/39)	29.7% (19/64)	27.7% (18/65)	27.5% (25/91)	32.6% (30/92)	24.1% (26/108)	30.3% (33/109)	47.4% (64/135)
K	100.0% (2/2)	33.3% (1/3)	33.3% (1/3)	58.8% (10/17)	33.3% (6/18)	17.2% (5/29)	24.1% (7/29)	18.9% (7/37)	48.7% (18/37)	50.0% 24/48
P	50.0% (3/6)	69.2% (9/13)	53.9% (7/13)	40.0% (10/25)	40.0% (10/25)	20.0% (7/35)	30.6% (11/36)	30.8% (12/39)	55.0% (22/40)	54.6% (30/55)
QA	80.0% (4/5)	28.6% (2/7)	31.6% (6/19)	45.0% (18/40)	32.6% (14/43)	24.5% (13/53)	34.6% (18/52)	32.8% (21/64)	37.5% (24/64)	25.6% (21/82)
T	23.8% (5/21)	18.6% (8/43)	11.6% (17/147)	17.3% (64/369)	19.1% (71/371)	16.7% (77/461)	22.5% (104/462)	17.5% (89/510)	17.2% (88/513)	20.4% (109/534)
Z	47.2% (25/53)	61.8% (81/131)	38.9% (81/208)	41.7% (138/331)	47.3% (158/334)	35.4% (168/474)	40.8% (198/485)	35.3% (220/624)	49.9% (316/633)	45.1% (332/736)
ZA	58.3% (7/12)	57.1% (12/21)	35.1% (20/57)	47.3% (43/91)	35.1% (33/94)	39.4% (48/122)	43.9% (54/123)	31.1% (43/138)	49.6% (69/139)	41.3% (64/155)
Other	38.5% (5/13)	44.4% (8/18)	42.1% (8/19)	40.0% (16/40)	42.5% (17/40)	25.9% (14/54)	29.1% (16/55)	23.8% (15/63)	45.5% (30/66)	43.6% (41/94)

Table A8: Percent of Titles Used by Year from Publication, by LC Class Range

LC Range	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
AM	82.8% (24/29)	80.0% (24/30)	68.0% (17/25)	63.6% (7/11)	33.3% (3/9)	70.0% (7/10)	37.5% (3/8)	42.9% (3/7)	40.0% (2/5)	33.3% (1/3)	N/A
AZ	50.0% (6/12)	72.2% (13/18)	53.9% (7/13)	69.2% (9/13)	83.3% (5/6)	0.0% (0/1)	100.0% (2/2)	50.0% (1/2)	50.0% (1/2)	50.0% (1/2)	N/A
CD	100.0% (11/11)	88.9% (16/18)	46.7% (7/15)	22.2% (2/9)	42.9% (3/7)	100.0% (1/1)	100.0% (1/1)	N/A	N/A	N/A	N/A
HC	45.5% (10/22)	40.0% (10/25)	45.0% (9/20)	10.5% (2/19)	50.0% (5/10)	0.0% (0/12)	21.4% (3/14)	28.6% (4/14)	18.2% (2/11)	30.0% (3/10)	16.7% (1/6)
HD	41.8% (61/146)	36.3% (70/193)	23.7% (44/186)	19.3% (28/145)	19.4% (28/144)	11.9% (14/118)	19.3% (17/88)	19.6% (11/56)	10.4% (5/48)	25.0% (6/24)	14.3% (2/14)
HM	59.7% (40/67)	66.3% (57/86)	42.3% (30/71)	32.8% (20/61)	30.4% (14/46)	25.6% (11/43)	35.5% (11/31)	52.6% (10/19)	26.7% (4/15)	55.6% (5/9)	25.0% (1/4)
K	70.6% (12/17)	66.7% (22/33)	58.1% (18/31)	31.8% (7/22)	33.3% (4/12)	30.0% (3/10)	33.3% (1/3)	33.3% (1/3)	0.0% (0/3)	0.0% (0/1)	100.0% (1/1)
P	86.4% (19/22)	79.6% (35/44)	57.6% (19/33)	33.3% (9/27)	50.0% (11/22)	23.1% (3/13)	50.0% (3/6)	33.3% (1/3)	66.7% (2/3)	0.0% (0/2)	N/A
QA	50.0% (16/32)	55.1% (27/49)	35.9% (19/53)	34.9% (15/43)	30.0% (9/30)	38.1% (8/21)	41.2% (7/17)	54.6% (6/11)	33.3% (2/6)	50.0% (1/2)	100.0% (1/1)
T	42.9% (90/210)	37.0% (113/305)	34.8% (112/322)	24.1% (78/324)	21.2% (57/269)	17.2% (38/221)	14.1% (23/163)	9.8% (11/112)	3.0% (2/66)	5.3% (2/38)	5.9% (1/17)
Z	75.9% (314/414)	73.8% (372/504)	48.8% (203/416)	46.1% (142/308)	38.8% (95/245)	35.0% (69/197)	34.4% (45/131)	36.7% (33/90)	36.9% (24/65)	32.4% (12/37)	48.0% (12/25)
ZA	65.8% (50/76)	65.1% (67/103)	52.1% (50/96)	46.9% (38/81)	50.8% (33/65)	37.0% (20/54)	33.3% (14/42)	46.2% (12/26)	55.6% (10/18)	70.0% (7/10)	28.6% (2/7)
Other	78.4% (40/51)	70.0% (42/60)	49.2% (29/59)	39.0% (16/41)	25.8% (8/31)	0.0% (0/21)	0.0% (0/11)	28.6% (2/7)	33.3% (1/3)	50.0% (1/2)	0.0% (0/1)

Table A9: Percent of Titles Used by Year from Publication, by Publication Year

Publication Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
2006	N/A	N/A	N/A	N/A	N/A	0.0% (0/7)	15.2% (5/33)	39.1% (25/64)	36.4% (24/66)	32.9% (23/70)	6% (21/76)
2007	N/A	N/A	N/A	N/A	44.4% (4/9)	32.4% (11/34)	40.6% (26/64)	32.4% (22/68)	23.5% (16/68)	22.9% (16/70)	N/A
2008	N/A	N/A	N/A	38.9% (7/18)	30.2% (16/53)	28.9% (28/97)	24.0% (24/100)	21.8% (22/101)	13.5% (15/111)	N/A	N/A
2009	N/A	N/A	27.6% (8/29)	34.9% (23/66)	32.4% (36/111)	25.7% (29/113)	18.4% (21/114)	22.2% (26/117)	N/A	N/A	N/A
2010	N/A	39.1% (25/64)	30.6% (41/134)	36.1% (66/183)	35.9% (70/195)	25.8% (50/194)	26.2% (54/206)	N/A	N/A	N/A	N/A
2011	55.1% (27/49)	50.6% (91/180)	46.9% (113/241)	38.7% (101/261)	33.7% (90/267)	20.2% (56/277)	N/A	N/A	N/A	N/A	N/A
2012	46.0% (63/137)	57.1% (129/226)	41.5% (100/241)	32.6% (79/242)	22.6% (59/261)	N/A	N/A	N/A	N/A	N/A	N/A
2013	58.3% (137/235)	52.2% (170/326)	55.6% (189/340)	29.0% (97/334)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2014	59.0% (164/278)	62.3% (208/334)	31.8% (113/355)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2015	69.9% (167/239)	72.5% (245/338)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2016	79.0% (135/171)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix B

This appendix includes tables of summary descriptive statistics underlying the top quartile index scores shown in table 3 of the text. For each category, table B1 shows the total number of top-quartile titles, plus the percentage of titles of the total top quartile titles that category represented. Because some publishers did not have sufficient titles to break down into the top quartile analysis, table B2 shows the total number of titles in the category overall for the publishers included, with the percentages of titles it represented in the collection overall. The relative usage index scores in table 3 of the text are then calculated by dividing the percentages in table B1 by the percentages in table B2.

Table B1: Total Titles in the Top Quartile of Used Ebooks and Percentage of Top-Quartile Titles

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Total Audience											
Professional	74 (38.5%)	76 (34.7%)	52 (36.6%)	32 (34.8%)	28 (40.6%)	17 (38.6%)	11 (30.6%)	8 (30.8%)	3 (23.1%)	3 (25.0%)	0 (0.0%)
General Academic	17 (8.9%)	29 (13.2%)	12 (8.5%)	9 (9.8%)	7 (10.1%)	4 (9.1%)	3 (8.3%)	2 (7.7%)	2 (16.7%)	2 (16.7%)	2 (40.0%)
Advanced Academic	100 (52.1%)	113 (51.6%)	76 (53.5%)	51 (55.4%)	34 (49.3%)	23 (52.3%)	22 (61.1%)	16 (61.5%)	7 (58.3%)	7 (58.3%)	3 (60.0%)
Other	1 (0.5%)	1 (0.5%)	2 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total Genre											
Bibliography	2 (1.0%)	5 (2.3%)	2 (1.4%)	4 (4.3%)	2 (2.9%)	2 (4.5%)	1 (2.8%)	0 (0.0%)	1 (7.7%)	1 (8.3%)	1 (20.0%)
Encyclopedia	3 (1.6%)	4 (1.8%)	3 (2.1%)	2 (2.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Handbooks, Guides, and											
Technical Manuals	67 (34.9%)	55 (25.1%)	35 (24.6%)	19 (20.7%)	16 (23.2%)	5 (11.4%)	7 (19.4%)	5 (19.2%)	2 (15.4%)	2 (16.7%)	0 (0.0%)
Proceedings	30 (15.6%)	34 (15.5%)	28 (19.7%)	26 (28.3%)	23 (33.3%)	12 (27.3%)	10 (27.8%)	8 (30.8%)	6 (46.2%)	4 (33.3%)	1 (20.0%)
Textbooks	13 (6.8%)	20 (9.1%)	16 (11.3%)	7 (7.6%)	3 (4.3%)	5 (11.4%)	2 (5.6%)	2 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other Reference	1 (0.5%)	2 (0.9%)	2 (1.4%)	1 (1.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other	1 (0.5%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	1 (2.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Monographs	27 (14.1%)	32 (14.6%)	15 (10.6%)	12 (13.0%)	8 (11.6%)	4 (9.1%)	4 (11.1%)	2 (7.7%)	1 (7.7%)	3 (25.0%)	2 (40.0%)
Collections	48 (25.0%)	67 (30.6%)	40 (28.2%)	21 (22.8%)	17 (24.6%)	15 (34.1%)	12 (33.3%)	9 (34.6%)	3 (23.1%)	2 (16.7%)	1 (20.0%)
Total Class											
AM	11 (5.7%)	6 (2.7%)	2 (1.4%)	1 (1.1%)	1 (1.4%)	0 (0.0%)	0 (0.0%)	1 (3.8%)	1 (7.7%)	0 (0.0%)	0 (0.0%)
AZ	1 (0.5%)	3 (1.4%)	2 (1.4%)	1 (1.1%)	0 (0.0%)	0 (0.0%)	1 (2.8%)	0 (0.0%)	0 (0.0%)	1 (8.3%)	0 (0.0%)
CD	5 (2.6%)	3 (1.4%)	2 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
HC	2 (1.0%)	2 (0.9%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.8%)	0 (0.0%)	2 (15.4%)	1 (8.3%)	0 (0.0%)
HD	16 (8.3%)	15 (6.8%)	10 (7.0%)	5 (5.4%)	4 (5.8%)	2 (4.5%)	2 (5.6%)	2 (7.7%)	1 (7.7%)	2 (16.7%)	1 (20.0%)
HM	11 (5.7%)	18 (8.2%)	12 (8.5%)	4 (4.3%)	4 (5.8%)	4 (9.1%)	4 (11.1%)	6 (23.1%)	1 (7.7%)	1 (8.3%)	1 (20.0%)
K	5 (2.6%)	3 (1.4%)	3 (2.1%)	0 (0.0%)	2 (2.9%)	0 (0.0%)	1 (2.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
P	4 (2.1%)	9 (4.1%)	5 (3.5%)	4 (4.3%)	1 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
QA	2 (1.0%)	10 (4.6%)	4 (2.8%)	3 (3.3%)	5 (7.2%)	1 (2.3%)	2 (5.6%)	3 (11.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
T	18 (9.4%)	20 (9.1%)	19 (13.4%)	17 (18.5%)	13 (18.8%)	11 (25.0%)	5 (13.9%)	2 (7.7%)	0 (0.0%)	0 (0.0%)	1 (20.0%)
Z	94 (49.0%)	105 (47.9%)	63 (44.4%)	44 (47.8%)	27 (39.1%)	18 (40.9%)	18 (50.0%)	9 (34.6%)	6 (46.2%)	4 (33.3%)	1 (20.0%)
ZA	12 (6.3%)	18 (8.2%)	15 (10.6%)	9 (9.8%)	8 (11.6%)	8 (18.2%)	2 (5.6%)	2 (7.7%)	2 (15.4%)	2 (16.7%)	1 (20.0%)
Other	11 (5.7%)	7(3.2%)	4 (2.8%)	4 (4.3%)	4 (5.8%)	0 (0.0%)	0 (0.0%)	1 (3.8%)	0 (0.0%)	1 (8.3%)	0 (0.0%)

Table B2: Total Titles for Publishers in Top-Quartile Anaylsis and Percentage of All Titles

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Audience											
Professional	397 (37.5%)	485 (34.6%)	408 (31.9%)	336 (31.6%)	257 (29.9%)	192 (28.4%)	125 (25.6%)	96 (40.9%)	54 (28.0%)	42 (33.3%)	15 (37.5%)
General Academic	58 (5.5%)	100 (7.1%)	86 (6.7%)	64 (6.0%)	51 (5.9%)	38 (5.6%)	25 (5.1%)	18 (7.7%)	9 (4.7%)	7 (5.6%)	4 (10.0%)
Advanced Academic	597 (56.4%)	805 (57.5%)	772 (60.4%)	652 (61.4%)	542 (63.1%)	438 (64.8%)	334 (68.3%)	118 (50.2%)	127 (65.8%)	75 (59.5%)	20 (50.0%)
Other	6 (0.6%)	10 (0.7%)	13 (1.0%)	10 (0.9%)	9 (1.0%)	8 (1.2%)	5 (1.0%)	3 (1.3%)	3 (1.6%)	2 (1.6%)	1 (2.5%)
Genre											
Bibliography	11 (1.0%)	26 (1.9%)	24 (1.9%)	20 (1.9%)	19 (2.2%)	15 (2.2%)	7 (1.4%)	7 (3.0%)	7 (3.6%)	5 (4.0%)	3 (7.5%)
Encyclopedia	5 (0.5%)	7 (0.5%)	4 (0.3%)	4 (0.4%)	3 (0.3%)	2 (0.3%)	1 (0.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Handbooks, Guides, and											
Technical Manuals	292 (27.6%)	333 (23.8%)	249 (19.%)	182 (17.1%)	147 (17.1%)	118 (17.5%)	76 (15.5%)	56 (23.8%)	29 (15.0%)	26 (20.6%)	4 (10.0%)
Proceedings	188 (17.8%)	292 (20.9%)	330 (25.8%)	343 (32.3%)	312 (36.3%)	267 (39.5%)	215 (44.0%)	71 (30.2%)	102 (52.8%)	60 (47.6%)	19 (47.5%)
Textbooks	59 (5.6%)	75 (5.4%)	69 (5.4%)	50 (4.7%)	35 (4.1%)	28 (4.1%)	18 (3.7%)	16 (6.8%)	6 (3.1%)	4 (3.2%)	2 (5.0%)
Other Reference	3 (0.3%)	6 (0.4%)	6 (0.5%)	5 (0.5%)	3 (0.3%)	1 (0.1%)	1 (0.2%)	1 (0.4%)	1 (0.5%)	1 (0.8%)	0 (0.0%)
Other	2 (0.2%)	7 (0.5%)	8 (0.6%)	8 (0.8%)	8 (0.9%)	5 (0.7%)	3 (0.6%)	1 (0.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Monographs	192 (18.1%)	254 (18.1%)	234 (18.3%)	178 (16.8%)	130 (15.1%)	90 (13.3%)	77 (15.7%)	34 (14.5%)	24 (12.4%)	15 (11.9%)	9 (22.5%)
Collections	306 (28.9%)	400 (28.6%)	355 (27.8%)	272 (25.6%)	202 (23.5%)	150 (22.2%)	91 (18.6%)	49 (20.9%)	24 (12.4%)	15 (11.9%)	3 (7.5%)
Class											
AM	28 (2.6%)	28 (2.0%)	23 (1.8%)	10 (0.9%)	9 (1.0%)	10 (1.5%)	6 (1.2%)	6 (2.6%)	3 (1.6%)	3 (2.4%)	0 (0.0%)
AZ	9 (0.9%)	15 (1.1%)	11 (0.9%)	11 (1.0%)	5 (0.6%)	0 (0.0%)	2 (0.4%)	0 (0.0%)	1 (0.5%)	1 (0.8%)	0 (0.0%)
CD	11 (1.0%)	18 (1.3%)	15 (1.2%)	9 (0.8%)	7 (0.8%)	1 (0.1%)	1 (0.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
HC	22 (2.1%)	25 (1.8%)	20 (1.6%)	19 (1.8%)	10 (1.2%)	12 (1.8%)	14 (2.9%)	13 (5.5%)	8 (4.1%)	8 (6.3%)	5 (12.5%)
HD	142 (13.4%)	190 (13.6%)	184 (14.4%)	143 (13.5%)	141 (16.4%)	118 (17.5%)	80 (16.4%)	45 (19.1%)	27 (14.0%)	20 (15.9%)	8 (20.0%)
HM	66 (6.2%)	84 (6.0%)	70 (5.5%)	60 (5.6%)	45 (5.2%)	42 (6.2%)	29 (5.9%)	16 (6.8%)	12 (6.2%)	7 (5.6%)	3 (7.5%)
K	15 (1.4%)	26 (1.9%)	22 (1.7%)	15 (1.4%)	8 (0.9%)	8 (1.2%)	3 (0.6%)	3 (1.3%)	3 (1.6%)	1 (0.8%)	0 (0.0%)
P	20 (1.9%)	39 (2.8%)	29 (2.3%)	25 (2.4%)	19 (2.2%)	11 (1.6%)	6 (1.2%)	3 (1.3%)	3 (1.6%)	2 (1.6%)	0 (0.0%)
QA	30 (2.8%)	48 (3.4%)	50 (3.9%)	41 (3.9%)	29 (3.4%)	20 (3.0%)	15 (3.1%)	7 (3.0%)	5 (2.6%)	2 (1.6%)	0 (0.0%)
T	199 (18.8%)	296 (21.1%)	318 (24.9%)	321 (30.2%)	267 (31.1%)	219 (32.4%)	158 (32.3%)	44 (18.7%)	62 (32.1%)	38 (30.2%)	8 (20.0%)
Z	397 (37.5%)	476 (34.0%)	390 (30.5%)	290 (27.3%)	228 (26.5%)	162 (24.0%)	124 (25.4%)	72 (30.6%)	51 (26.4%)	32 (25.4%)	10 (25.0%)
ZA	73 (6.9%)	99 (7.1%)	92 (7.2%)	79 (7.4%)	63 (7.3%)	54 (8.0%)	41 (8.4%)	20 (8.5%)	16 (8.3%)	10 (7.9%)	5 (12.5%)
Other	46 (4.3%)	56 (4.0%)	55 (4.3%)	39 (3.7%)	28 (3.3%)	19 (2.8%)	10 (2.0%)	6 (2.6%)	2 (1.0%)	2 (1.6%)	1 (2.5%)

Notes on Operations

The Big Picture: A Holistic View of E-book Acquisitions

Ronald M. Lewis and Marie R. Kennedy

The merging of two departments into the Acquisitions and Collection Development Department afforded Loyola Marymount University an opportunity to rethink existing workflows, with the acquisition of electronic books (e-books) being identified as a critical task to review. Process mapping was used to show the complexity of different tasks being performed in the department and to provide a visualization mechanism for staff to see how their work fit into a sequence of actions as part of a larger workflow. The authors listed the types of acquisition models used at their library for e-books and constructed process maps for the following six major types: 1. Firm order e-books; 2. Firm order e-book collections; 3. Approval order e-books; 4. Demand-driven e-books; 5. Standing order e-books, and; 6. Subscription e-book database. The authors merged the individual process maps into a single visualization to view the entirety of the acquisition process as a whole and to show how the different e-book acquisition models relate and diverge from one another.

In a highly technical environment, it can be easy to lose sight of how the task with which one is charged with completing fits into or impacts the larger organization. When the head of Collection Development became the new head of Acquisitions and Serials, the two departments merged to become the Acquisitions and Collection Development Department at the William H. Hannon Library. In 2014, the newly combined departments had an opportunity to review existing workflows and determine the necessary staffing to complete particular tasks as a natural part of the reorganization process. The Acquisitions and Collection Development Department first identified critical workflows and focused on revising the procedural documentation for those essential tasks. One essential workflow that was identified was for acquiring electronic books (e-books). As the group met to discuss the workflow and identify the staff members that performed each function in the e-book acquisition process, it became clear that as staff completed their steps for inclusion in the integrated library system (ILS) and related commercial product systems, there was a feeling of unfamiliarity with the steps that other staff were performing, and a lack of knowledge regarding where or when the overall process began or ended. This lack of comprehension of the complete e-book acquisitions process is important to note, because in an electronic environment, as De Fino and Lo state, "There are no physical books to pass from one player to the next, and there is no trigger to activate each step of the workflow."[1] The acquisitions librarian, in a newly created position, saw the reviewing and documenting of workflows as an opportunity to develop a mechanism to transition from a silo workflow mentality and show staff how their individual procedures incorporate into a full workflow process.

Before the two departments merged, the Acquisitions and Serials Department spent several years creating a wiki documenting step-by-step instructions for all tasks completed in the department, even those provided by student employees. Merging with another department provided the opportunity to rethink the wiki, which included a plan to institute a visualization of the key steps for each procedure. The effort to document workflows with a visual process

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map was timely, as it allowed staff in the newly merged department to see evidence of the complexity of some of the tasks they completed, and how their own work fits into the entire process.

Problem Statement

During departmental conversations about reviewing existing workflows, e-books emerged as a top concern. Given the increasing amount of funds spent to purchase e-books, and the complexity of acquisition models, the department wanted to ensure that staff were working as efficiently as possible, and avoiding duplication of effort or missed steps in the process. Additionally, the authors were interested in learning how all of the e-book workflows possibly fit together to better understand the acquisitions process from a holistic viewpoint; the concept of process mapping was identified as a means by which the department could outline and visualize the whole process.

Literature Review

Workflow

E-books have been advantageous for patrons who require immediate access to content, yet providing timely access is challenging because of the multiple ways that e-books can be acquired. In their review of the professional literature, the authors did not find a universal approach to establishing workflow models for e-book acquisition due to the different types, sizes, and staffing of libraries. They examined the literature specifically to learn how libraries described workflows, lifecycles or stages, tools or systems, acquisition models, challenges, and solutions as they relate to e-books or electronic resource management.

Regarding the concept of workflow, there can be confusion about how policy, workflow, and procedure are defined and relate to one another. Mackinder noted the underlying differences between these types of documentation as "policy decisions determine the form a workflow will take, and the workflow should outline the guidelines to be followed in the procedures that pertain to it."[2] In Mackinder's opinion, with which the authors agree, the terms used within a workflow should not refer to specific vendor-provided products because they change over time for various reasons, and the documentation should serve as a connection between the plan established in a policy and the exact steps to follow as detailed in the procedure.[3] Rather than listing step-by-step instructions on how to perform a task, a workflow can provide the big picture and serve as a guide to illustrate for stakeholders the order in which actions are expected to be accomplished and why. Having a documented workflow can prevent a situation where a single staff member holds knowledge, particularly if that person leaves, retires, or is unexpectedly unavailable, such as in the case of an emergency or illness, and it provides assurance that the work will proceed without interruption if this person is not available. When reflecting on the biggest challenges of documenting a workflow, Mackinder conveyed that "balancing the big picture needs with providing enough context to allow staff to determine the next step; finding the best way to represent the myriad possibilities that exist for any given stop on the lifecycle road; and finding the time to devote to this project while still managing the very day-to-day tasks that I will be working to document."[4]

The literature reveals a variety of phases involved in the management of a library's e-resources, and an electronic resource management (ERM) system provides features to address these series of stages. When convening a task force of librarians and staff to examine how e-books were managed at their institution, Beisler and Kurt determined that four processes occurred in the workflow: assessment/acquisition, access, maintenance/troubleshooting, and end of life.[5] Vasileiou, Rowley, and Hartley reviewed the literature on e-books and did not find studies that offer "a holistic framework of the issues and challenges mapped onto the stages in the e-book management process," and semi-structured interviews were conducted with academic librarians to identify "the stages in the e-book management process and key activities and challenges and issues associated with each of the stages."[6] Vasileiou, Rowley, and Hartley's research resulted in demonstrating the activities and challenges occurring within a framework for the management of e-books that consisted of nine stages: collection development policy; budget; discovery; evaluation and selection; license negotiations; cataloging and delivery; marketing/promotion and user education; monitoring and reviewing; and renewals and cancellations.[7] Anderson believed that five elements required a dedicated focus to minimize the difficulty of managing e-resources: knowledge base, budget, administration, licensing, and reports.[8] Depending on the ERM used and dedicated staff, the time and effort devoted to these five parts will differ by library. The stages or elements described above can be thought of as an e-resource's lifecycle. Mackinder envisioned each of the different stages of an e-resource lifecycle as containing workflows within workflows and its lifetime consisting of six phases: new acquisition, activation, cataloging, maintaining access, troubleshooting, and evaluation.[9]

The authors noted several tools cited in the literature used in libraries to assist in the management of an e-resource's lifecycle in libraries and the impact specific features and functions can have on workflows. Tull et al. outlined the steps of an ERM workflow and described how

Innovative Interfaces, Inc.'s ERM could be used at each stage of the process.[10] England, Fu, and Miller maintained checklists to manage e-resources using LibGuides and provided steps on creating a checklist through planning, developing, drafting, testing, and validating.[11] Dowdy and Raeford selected IBM's BlueWorks Live and Business Process Manager as its ERM system because it had the potential to revise their e-resources workflow to meet their needs, like minimizing the need for using email as a communication tool and recalling knowledge.[12] Smith utilized the LibAnswers ticketing system to manage access issues commonly caused by vendor problems, subscription problems, incorrect metadata, local system problems, authentication problems, and end user problems; using a ticketing system eliminated the need for email because communication was provided in a centralized location.[13] Chen, Kim, and Montgomery discussed the impact Ex Libris' Alma library services platform had on improving the overall efficiency in e-book record management, which allowed them to transition from a mostly manual process used with their previous system.[14]

Beisler and Kurt noted the lack of published material about e-book workflows and observed three initial paths for the acquisition of e-books before the models merged to provide access: database subscription/standing order, one-time purchase without annual fees, and one-time purchase with annual fees.[15] Schmidt identified four e-book workflows based on acquisition models: title-by-title publisher direct purchases; vendor subscription packages; patron-driven acquisitions through a vendor; and purchased e-book collection from a publisher.[16]

The demand-driven acquisition (DDA) model removes the librarian from the selection process of a library's e-book collection and gives the patron control through discovery and use of a title. De Fino and Lo provided a case study of their institution's workflow when setting up a patron-driven plan, the results of their pilot project, and what they learned by using this type of collection development model.[17] A DDA case study from Draper described the cataloging policies established at his institution for MARC records and how this was implemented, while also discussing the workflows employed by their staff to provide this new service for their patrons.[18] Downey explained the rationale for starting a DDA pilot project at her institution, what steps were taken to set up this plan with a book jobber, and outlined the sequence of actions in the technical process workflow.[19] Similarly, Vermeer also detailed the reasons her institution decided to trial DDA, the preparation involved in setting it up, and the adjustments made to the workflow from unexpected issues.[20]

Emery acknowledged the challenges of being unable to fully adapt procedures used for print material because it could not systematically transfer to its electronic counterpart due to the multiplicity of new variables to consider, such as accounting for the different ways an e-resource can be purchased and ensuring that it is set up properly to be accessible to patrons.[21] Wu and Mitchell looked at their use of vendor-provided e-book records and described how the batch processing of these records was managed at their institution.[22] Although this offers the benefit of quickly making a large number of titles accessible to patrons, it also presents a challenge of handling records of varying quality from a multitude of vendors. Traill also discussed the steps taken at her institution to identify and address the most common issues discovered during an analysis of their vendor-supplied records.[23] A further case study from Turner provided another examination of the benefits and challenges when using the batch loading process.[24] Vasileiou, Rowley, and Hartley identified license negotiations, marketing/promotion and user education, usage evaluation and monitoring, and renewal and cancellation practices as the areas of the e-book management process that need the most development.[25] Hodge, Manoff, and Watson presented the difficulties encountered in ensuring that all the steps for an individual e-book workflow were completed without repeating the same actions.[26] Regarding e-book collections, Hodge et al. viewed access as the central challenge due to the steps necessary to prepare a large number of records for patrons.[27] Since access issues are a common occurrence for e-resources, Samples and Healy conducted a survey of Association of Research Libraries (ARL) members in the US and Canada to learn how other institutions handle the troubleshooting aspect of e-resource management workflow, and discovered responses were mainly reactive and not well coordinated.[28]

Due to the complex nature of e-resource management, solutions or recommendations have been suggested within the profession to adjust a workflow that is less straightforward than that used for print materials. Emery believed that e-resources workflows could be streamlined with management tools developed to use three systematic processing approaches: transactional, knowledge management, and decision support.[29] With the increased use of e-books at libraries, Vasileiou, Rowley, and Hartley recommended the following adjustments to a library's workflows, policies, and procedures: formulate policies for the development of e-book collections; develop consistent selection criteria and acquisition processes; build relationships with vendors to deal with an assortment of e-book related issues; develop marketing strategies; and monitor how patrons use e-books.[30]

Process Mapping

The authors also reviewed literature on how libraries have used process mapping to document these workflows. Watkins defined flowcharts, which can also be called process maps, as diagrammed illustrations of a process from initiation to completion that can be revised if a change occurs that affects the steps involved in the procedure. Five stages were identified in charting the flow of work: planning and conceptualizing, design, evaluate, documenting, and communication and reporting.[31] Barbrow and Hartline defined process mapping as an exercise to visually describe the important details of a workflow—a finished process map shows the stakeholders responsible for the activities taking place; lays out the ideas, information, and data occurring at certain steps throughout the process; and provides a means for retaining institutional knowledge.[32] They also viewed process mapping as a tool for organizational assessment because doing it routinely brings value to one's institution by evaluating processes to improve them.

Libraries have used process mapping as a planning and management tool in a variety of situations, including the management of electronic journal (e-journal) subscriptions to troubleshooting access issues. As a result of merging departments and the library's strategic mission, Watkins discussed a project to create a series of flowcharts illustrating the document delivery services workflow.[33] Striving to improve a process that overwhelmed three separate units, Youngman evinced how process mapping improved the selection, ordering, and payment for print monographs.[34] Yue and Anderson addressed using a flowchart from the Digital Library Federation Electronic Resource Management Initiative as a starting point to document the workflow involved in managing e-journal subscriptions.[35] When starting in a newly created position, Leffler developed a flowchart as a first step to defining her responsibilities because it visually showed the complexity of managing e-resources to staff who were unfamiliar with this lifecycle.[36] Using the business process modeling technique, role activity diagram, Tbaishat examined print and e-journal acquisition at two academic libraries, compared the workflows, and discussed the differences with each library staff member for possible improvements to their process.[37] Prilop, Westbrook, and German discussed a project at the University of Houston Libraries to develop an interdepartmental workflow for the digitization of materials in a central, online depository and provided the steps taken to collaboratively create this process map.[38] Hamlett presented on process mapping as a means to analyze workflows of different e-resource processes to help a library decide what is needed from an ERM.[39] Troubleshooting access issues for discovery systems using a systematically arranged set of queries and tests, Carter and Traill believed the visual cues inherent with flowcharts provides the proper communication tool with training, documentation, and as a reference aid.[40]

Method

Along with writing complete documentation for the departmental wiki for the e-book acquisitions process, the authors decided to demonstrate the entire workflow using a flowchart visualization. Since they were holistically interested in the process (one visualization for all the types of e-book acquisition models in use at the authors' library), they initially intended to recreate the workflow identified in Beisler and Kurt's paper "E-Book Workflow from Inquiry to Access: Facing the Challenges to Implementing E-Book Access at the University of Nevada, Reno."[41]

As the authors examined Beisler and Kurt's paper and studied its workflow diagram, they noted that three possible acquisition paths for e-books were identified: 1. Database subscription or standing order; 2. One-time purchase, no annual fees, and; 3. One-time purchase, with annual fees.[42] Since the publication of their paper, more types of e-book acquisition emerged, some of which the authors use in their department. As a result, they could not mimic Beisler and Kurt's diagram for their purpose. Using Beisler and Kurt's "path" approach, the authors considered the types of e-book acquisition presently used at their library and identified the six following major types: 1. Firm order e-books; 2. Firm order e-book collections; 3. Approval order e-books; 4. Demand-driven e-books; 5. Standing order e-books, and; 6. Subscription e-book database.

The authors drafted procedural documentation on how each type of e-book acquisition is handled at their library. They used that documentation to create a visualization of each acquisition type, to "depict the roles of a variety of stakeholders who impact or act in the process."[43] Finally, the authors merged the visualizations for each type of e-book acquisition into one large visualization to view the entirety of the acquisition process as a whole. They recorded the procedural documentation in a wiki on the web-based PBworks platform and created the visualizations of the process maps in the web-based software, Lucidchart.[44] The following sections describe the format of the procedural documentation and the authors' decisions regarding how to create the process maps.

Procedural Documentation

All staff in the authors' Acquisitions and Collection Development Department were given user accounts for the PBworks wiki platform, and the agency to create/revise/

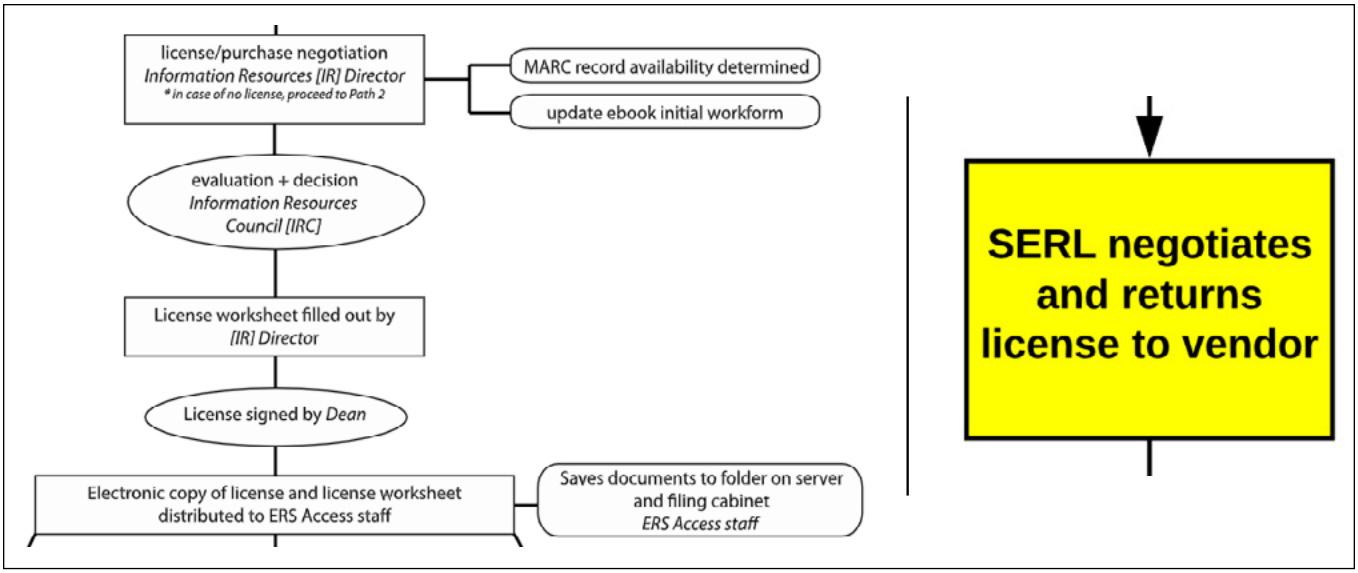

Figure 1. Level of Detail in Process Map

delete documentation for the procedures with which they are tasked. With the redesign of the departmental procedural manual, a template was created with four sections; one to introduce the procedure that links to a process map (the *Description* section), one for the detailed steps in the procedure (the *Instructions* section), one with a summarized list of tasks to check from the procedure (the *Checklist* section), and one listing procedures related to it in some way (the *Follow-up* section). A horizontal line marks the end of one section and the beginning of the next.

Here the authors describe the organization of the template in use for all of the e-book acquisition procedures. There are seven components to the Description section: introduction, purpose, staff involved, trigger point, frequency, required systems, and backups. The *introduction* states what procedure is being documented. The *purpose* states the procedure's rationale. The *staff involved* component lists the title of the staff person who performs the procedure. The *trigger point* notes what causes the procedure to take place. The *frequency* states how often the procedure occurs. The *required systems* component lists all systems required to complete the procedure. The *backups* component states the titles of two staff members who can perform the procedure if the person formally tasked is unavailable and how much acceptable time may pass before someone else has to perform the procedure. Below these is a link to a process map, with the specific parts of the procedure highlighted.

The Instructions section follows and contains detailed steps of the procedure with accompanying screenshots to help backups perform these tasks with confidence. The Checklist section follows and contains a summarized list of all tasks that should have been completed without the detail from the previous section. The last part of the template is the Follow-up section which lists links to any quality control procedures identified to ensure the procedure has been completed accurately and other procedures that are involved in the completion of the larger process. For the sake of completeness, the authors have written procedural documentation for each of the six major e-book acquisitions processes described in this paper. Each document is supported by a process map.

Process Maps

Early on in the development of their process maps, the authors had to decide how much text to display at each step. Keeping Mackinder's workflows comment that they "are and should be bigger-picture," the authors decided that their process maps would be limited to brief textual information at each of the steps, noting the person responsible for the step and a high-level summary of the work accomplished.[45] The left portion of figure 1 is the part of Beisler and Kurt's model related to licensing.[46] The right side shows how the authors have chosen to represent licensing using more brief text. Since each step in the process maps have a corresponding section in the procedure that details the work to be completed, the authors found that brief text in the process map is sufficient.

The authors also had to make some design choices at the outset to ensure that their workflows were visually consistent. For simplicity, they used only five shapes in their workflows. The Lucidchart software defines the names for these shapes. The authors used a *terminator* (capsule)

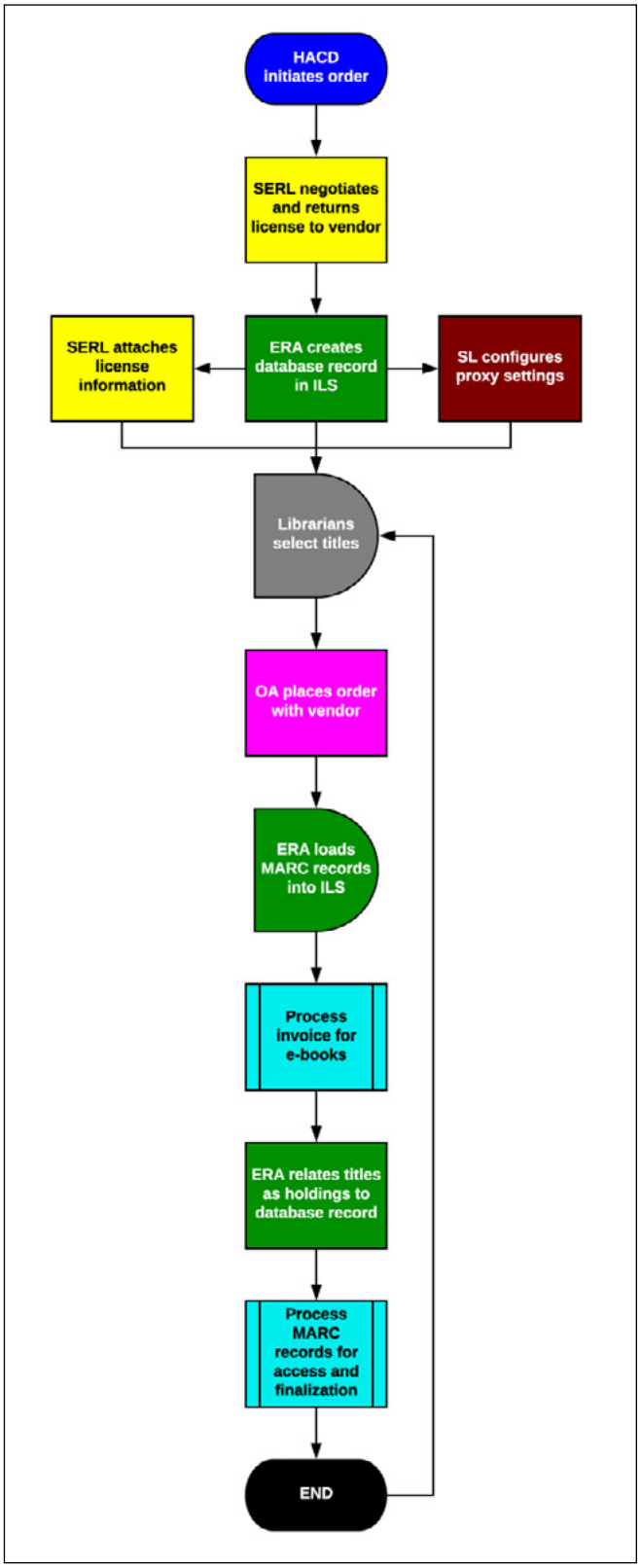

Figure 2. Process Map for Purchasing One-time, Single e-book Titles

for the start and end steps in the workflow. They used a *process box* (simple rectangle) for an action. A *predefined process box* (simple rectangle with an additional bar on each side) was used to show an action that takes place but is not required to be completed for the workflow to move forward. They used a *decision* (diamond) when the staff person completing the process posed a question. Lastly, a *delay* (capsule cut in half) was used to signify when a procedure must pause due to an external factor on the process.

Each staff person involved in the procedure is represented in the workflow by a different color; the shape is filled with the color assigned for the steps in the procedure for which they are responsible for completing. These colors are another visual cue used to gauge how much of a workflow is completed by any number of staff. The authors included the initials of the job titles in the step. "Electronic Resources Assistant," for example, is represented in all workflows as ERA. There are seven abbreviated stakeholders represented in the following process maps: Collection Development Committee (CDC), Electronic Resources Assistant (ERA), Head of Acquisitions and Collection Development (HACD), Librarian for Collection Development and Evaluation (LCDE), Ordering Assistant (OA), Serials and Electronic Resources Librarian (SERL), and Systems Librarian (SL). While tasked with redesigning the wiki, the acquisitions librarian is not an active stakeholder in these workflows but provides consultation and support gained from previously holding the ERA position. With their design elements defined, and decisions regarding how much text to include at each step in the workflow, the authors created the workflows for their six major e-book acquisitions processes.

Firm Order E-books

The library has licenses with many publishers to purchase materials through a third-party ordering system. With this system, any selector may purchase single title e-books and charge the purchase to the academic funds that he or she manages. In the resulting process map (see figure 2), the authors describe the process for purchasing one-time, single e-book titles.

The shape at the top is a *terminator* and is indicated with the text "HACD initiates order." The HACD is shown in workflows as the color blue. From the initial step of initiating the order, the process moves to the next shape: a *process box* with the text "SERL negotiates and returns license to vendor." At the authors' institution, it is mandatory to have in place a counter-signed license agreement from a vendor or publisher before purchases are made. The SERL completes this process. Between these two shapes is a directional arrow showing which step follows the first one. From this second step, one is visually guided to the third

shape: a *process box* with the text "ERA creates database record in ILS." The ERA creates a collection-level record in the ILS for the vendor or publisher as an organizing step. From this step, the workflow splits into three directions; the SERL attaches the terms and conditions of the license agreement to the collection-level record and the SL activates the collection in the proxy server configuration file. This enables resources to be accessed by off-campus users, and the librarians may begin purchasing e-books. Adjustments to the proxy server configuration can also occur after e-books are purchased if it is discovered to be incomplete. Because the selection process is intermittent and ongoing, this workflow step is visualized with the *delay* shape. Six staff/librarians are involved in the procedure shown by the process map for firm order e-book purchases.

Approval Order E-books

To enable the library to receive e-book content without the need for individual title selection, the HACD maintains an approval profile with a preferred vendor that automatically supplies e-books meeting predefined criteria in the profile.

The acquisition process for approval order e-books shares a workflow with firm order e-books (as visualized in figure 2), with the differences between the acquisition types noted in a detailed written procedure. Weekly title lists are provided by the approval vendor based on the predefined criteria, and this is currently limited to physics and chemistry and available through the vendor's ordering system. Unless an action is taken prior to the release of the next weekly approval list, these titles are automatically approved for order.

Firm Order E-book Collections

The library's CDC sometimes purchases a bundle of e-books from a publisher or aggregator, a decision usually predicated on desirable content that aligns with the library's collection. Since the purchase of a collection of e-books is costly, the decision to purchase is made at the committee level rather than by an individual selector.

The process for purchasing an e-book collection follows a similar workflow as individual e-books, with a few notable differences (as shown in figure 3). In this workflow, the CDC acts as the selector and individual librarians do not take action; the workflow represents this distinction because there are only five distinct staff noted. There is also a difference in how the order is placed because the SERL takes this action after negotiating the license with the vendor, unlike firm order e-books that are handled by the OA. Additionally, a single invoice for an e-book collection is processed before MARC records are loaded into the ILS, whereas processing occurs with firm order e-books each

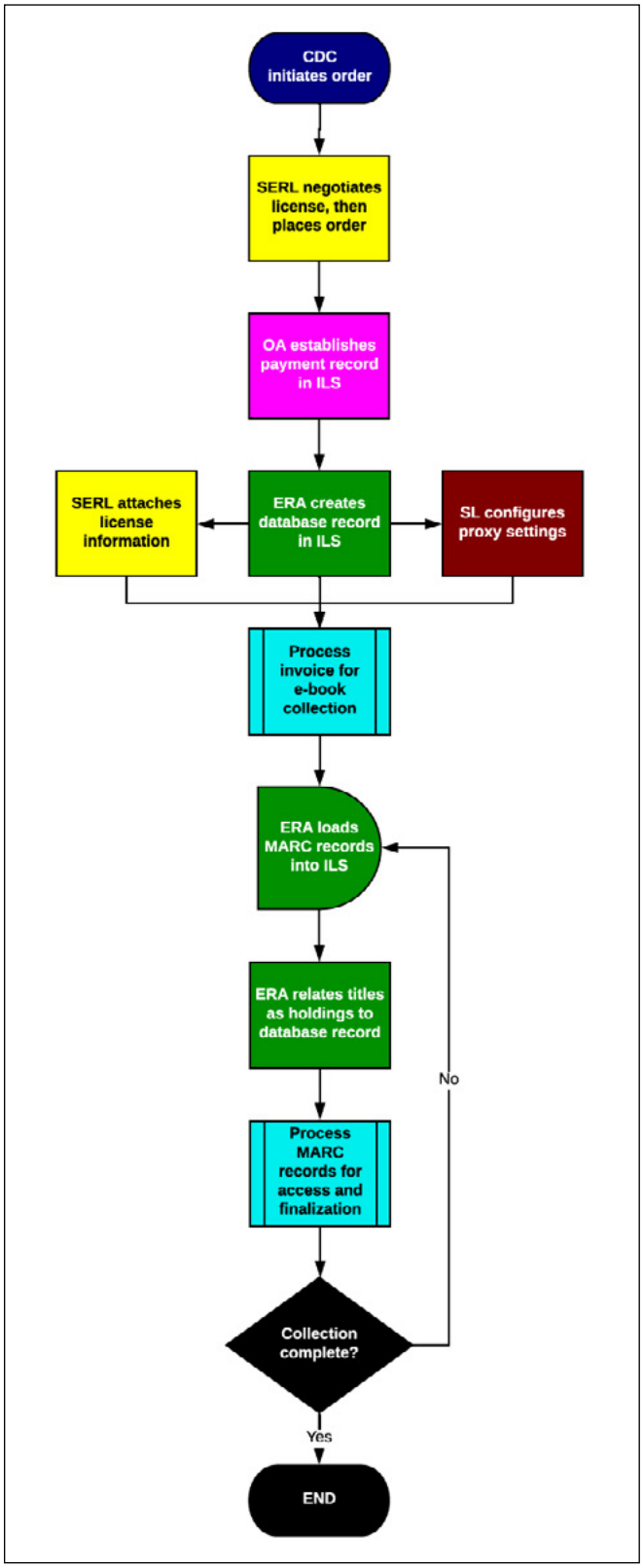

Figure 3. Process Map for Firm Order e-book Collections

time an invoice is received and once the MARC records are loaded into the ILS. With single title e-book purchases, the content is available in a relatively short time after purchase; this may not be the case with an e-book collection. If all content has not yet been published, the procedure must pause. With this workflow, the ERA must check periodically to see if new titles have been added to the collection. Their MARC records are loaded as new titles are added. This workflow is only complete when all content in the collection has been published, with records loaded into the ILS and related to the database record, and quality control procedures completed.

Subscription E-book Database

To gain access to a constantly changing, continually updated e-book collection, the library has e-book database subscriptions. The CDC has chosen to pursue some e-book subscriptions to round out the collection and to provide a large number of e-books addressing multiple academic areas.

The process of acquiring an e-book database subscription follows a selection path most similar to a firm order e-book collection, with a few exceptions. MARC records are continually loaded and removed from the ILS. After the initial load of MARC records, access checking, and quality control measures (as shown in figure 4), this workflow temporarily halts. Monthly updates indicate which MARC records need to be removed from the collection and new ones added, and so the terminator (the step marked "END") leads back to the step in the workflow to prompt the ERA to bring the catalog up to date.

Demand-Driven E-books

The departmental heads of Acquisitions and Serials and Collection Development initiated a demand-driven acquisitions workflow in 2011, with a test of seven subject profiles in their preferred vendor system. The pilot test served the library's patrons well enough that a decision was made to continue the service, expanding it to all of their subject areas. In 2013, the demand-driven profile was refined to also include short-term loans to address one-time or low uses of that e-book content.

Users are instrumental to this workflow since they drive selection decisions for the collection. The use of discovery records in the ILS provides the patron with a means to discover a DDA title, and the available titles continually change based on the vendor supplied records. Much like the subscription e-book database, the MARC records in the ILS are in flux with additions and deletions until the use of a title results in a purchase. This workflow is based on a predefined trigger event, a patron purchase of content, or a short-term loan of content. Each trigger event spurs

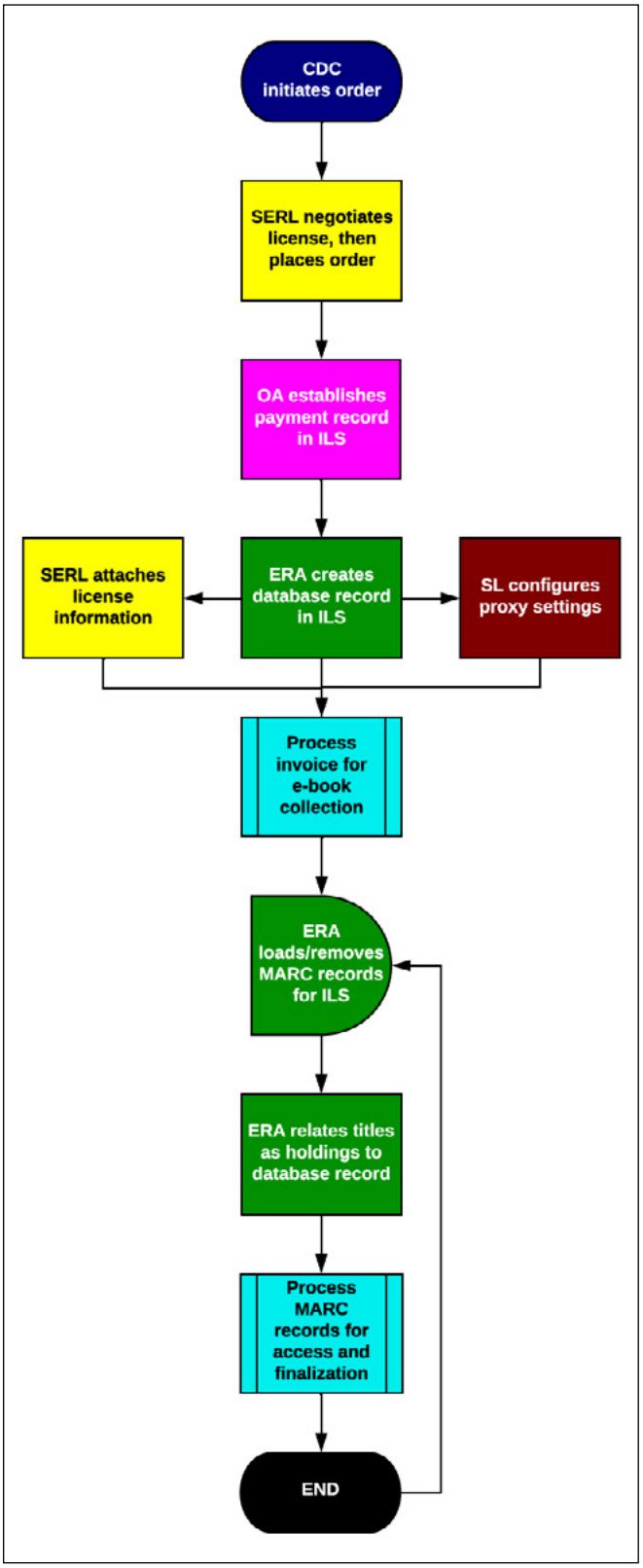

Figure 4. Process Map for Subscription e-book Database

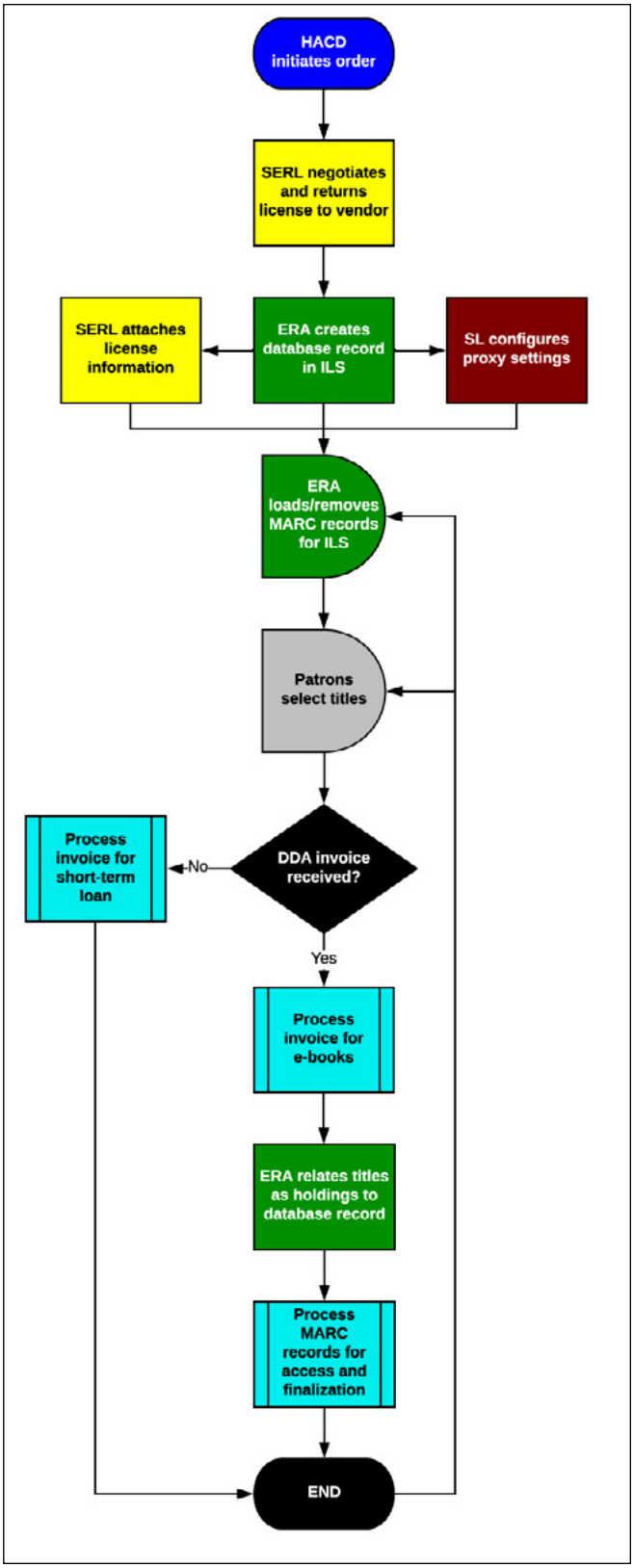

Figure 5. Process Map for Demand-driven e-books

the production of an invoice, the processing of which is addressed in the workflow (shown in figure 5).

Standing Order E-books

As selectors choose books to add to the collection, they may discover that titles belong to a monographic series and decide to start a standing order because the theme identifying them as a group contributes value to the overall collection. With this workflow, the selector will make a request to include the series of titles (with content in the series yet to be published) in the collection. The LCDE will examine the series and approve/deny its inclusion. Some factors influencing this decision include its relevance to the library's collection and the financial impact to the budget. If the LCDE approves the inclusion of the series, the SERL will pursue the negotiation of a license agreement, unless it is part of an existing license, and then the order and initial records are entered into the ILS by the OA (as shown in figure 6). After the initial set up of the series in the ILS, MARC records and invoices are received and processed as new volumes in the series are published. What differentiates a standing order e-book from the other acquisition types is that it may not follow or include all the steps outlined in the other e-book processes.

A Merged Workflow: A Holistic Look at the E-book Purchasing Process

The process map that merges the six e-book acquisition workflows provides a holistic view of how the processes relate to and diverge from one another. Each individual process map is represented by the following italicized abbreviations at the bottom of each shape (as shown in figure 7): Firm Order E-books (FO), Approval Order E-books (AO), Firm Order E-book Collections (FEC), Subscription E-book Database (SUB), Demand-Driven E-books (DDA), and Standing Order E-books (STO). Processes that occur in all of the workflows are represented as ALL. All workflows converge in the Merged E-book Acquisition Workflow process map, as shown in the center of figure 7, where three actions take place: "SERL attaches license information"; "ERA creates database record in ILS"; and "SL configures proxy setting." The second convergence of processes occurs towards the bottom of the process map where two actions take place: "ERA relates titles as holdings to database record" and "Process MARC records for access and finalization."

All the process maps begin with initiation of an order, and three unique stakeholders perform this action: the HACD, librarian, and CDC. On the merged process map there are three starting points: "HACD initiates order"

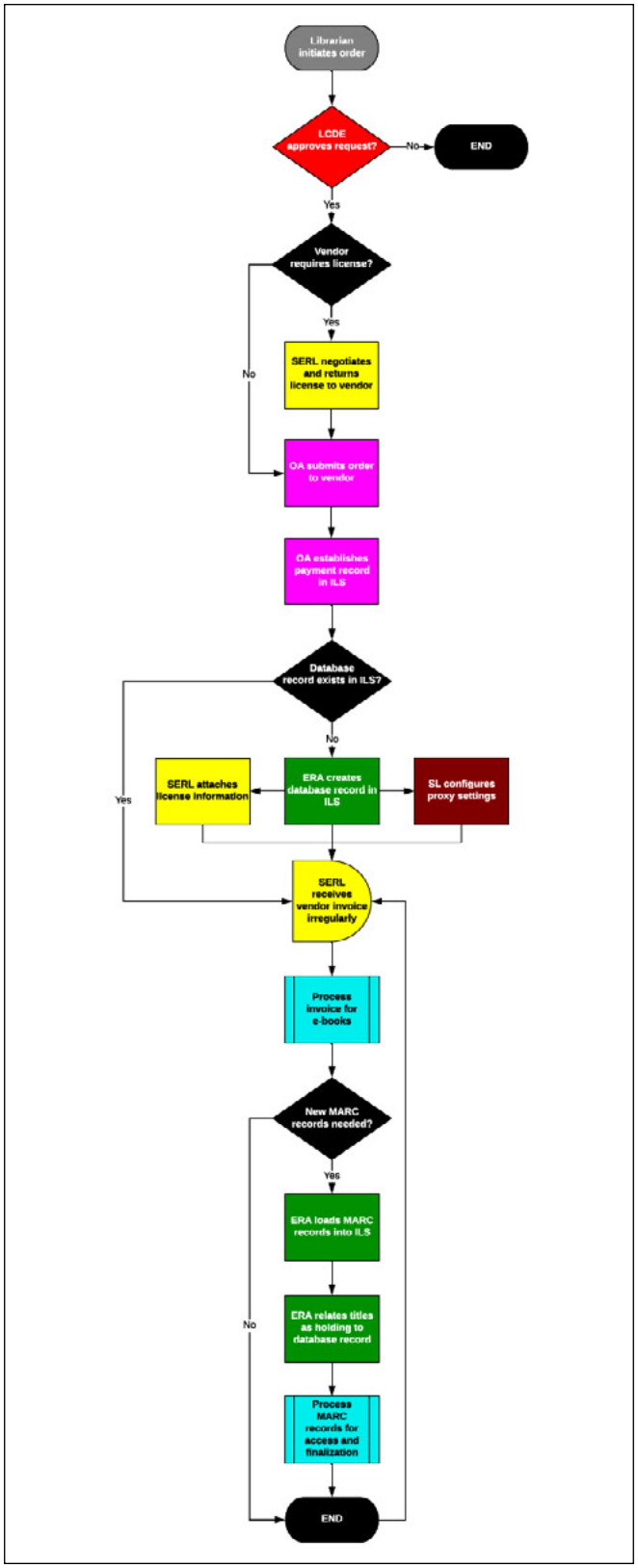

Figure 6. Process Map for Standing Order e-books

begins the AO, DDA, and FO workflow; "Librarian initiates order" begins the STO workflow; and "CDC initiates order" begins the FEC and SUB workflow. Each workflow on the merged process map temporarily ends as each one goes back to a delayed action to continue, looping indefinitely; MARC records are continually being added and removed from the ILS in the SUB workflow, while new titles are consistently selected and ordered in the other workflows, with the exception of the FEC workflow. This workflow ends when all MARC records from the collection of titles are provided.

Analysis

The authors' intention in defining e-book acquisition processes for each model in a step-by-step manner is to ensure that the individuals charged with completing the process work in a consistent, thorough manner, and to help them gain an understanding of the entire process. Sharing the entire process with all relevant individuals has contributed to an appreciation for the work of others in the department and a better understanding of the process. Documenting procedures has eliminated the issue illustrated in Dowdy and Raeford, "Effective communication . . . was driven by email and human memory"; anyone in the department can now refer to a procedure on the wiki with ease, rather than relying on a person or email.[47] Beyond the documentation aspect, the authors believe that merging the steps into a visual process map has assisted in the understanding of the whole process. As Copeland et al. note, the visual representation makes "it a good starting point for conversations about procedures."[48]

As the authors documented procedures and created process maps, they met frequently with staff involved in the larger task to gather feedback and to better describe how the process proceeded from one person to the next, and sought efficiencies. This process of writing, visualizing, and discussing has helped streamline all the e-book acquisitions processes. The authors found that if they defined a shortcut for one process, it was likely that it could be used in other processes.

Using a wiki for the documentation has proven to be important for the writing process since the wiki architecture saves previous versions of documents; the history of the development of these procedures is saved as part of the system itself. The wiki also permits the authors to track the dates of changes to documents and indicates who made the changes. Creating a document template has helped the department to organize how documentation is written and enables them to quickly find desired sections of any document, based on the structure they have defined.

Using online software like Lucidchart has been

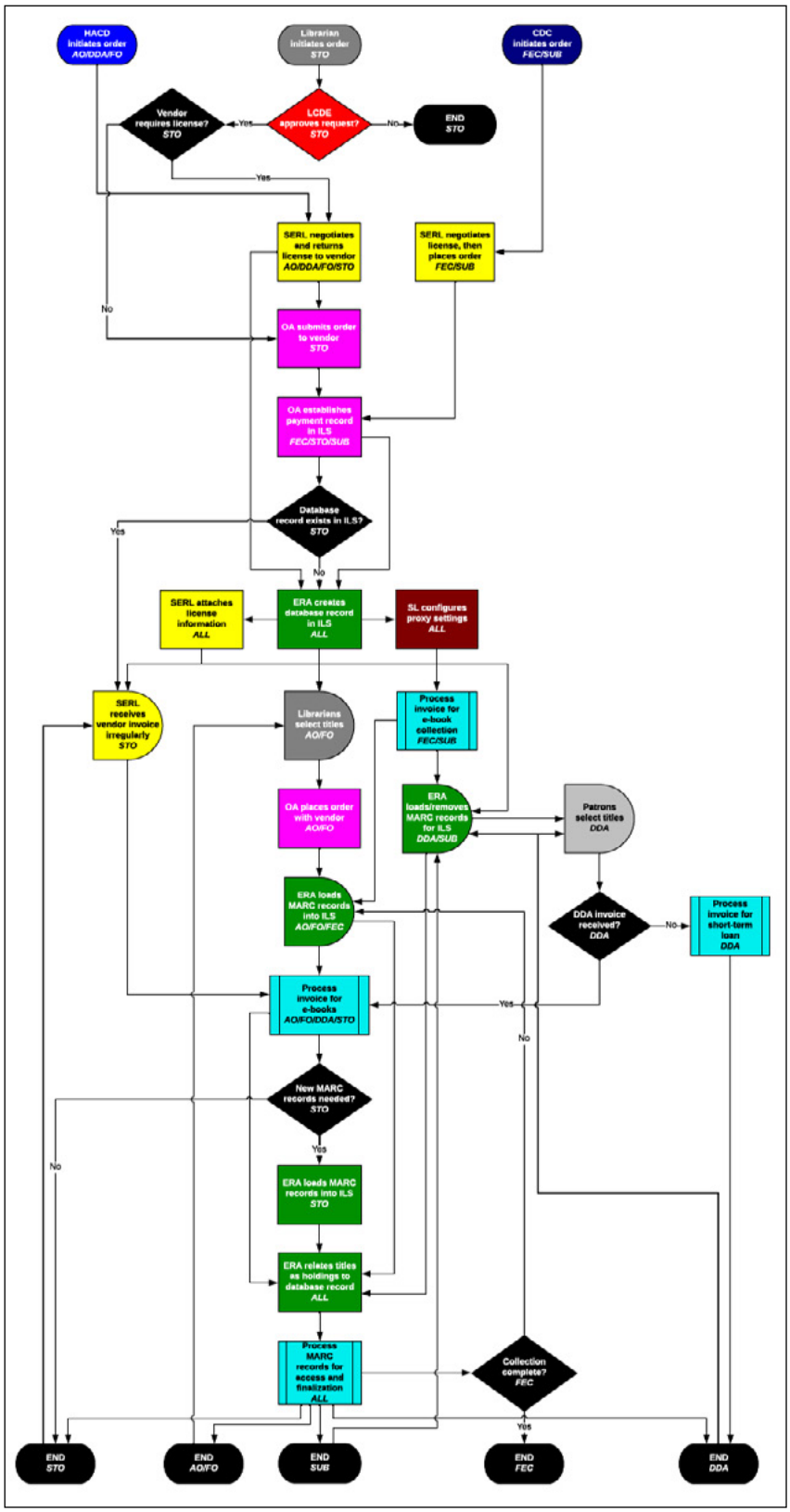

Figure 7. Process Map Merging the Six e-book Acquisition Workflows

advantageous for the authors because of its ease of use. Having defined for themselves a style guide (which shapes to use, which font style and size, and which colors to use for which staff member), the authors can easily change existing visualizations as procedures evolve.

Limitations and Future Research

When the authors initially began to document procedures, the main objective was to record them quickly to preserve the knowledge of the existing staff. When they neared completion, the next goal was to expand what was drafted so that any staff member assigned as a backup for a procedure could confidently perform it as needed. A process map provides a visual roadmap to connect multiple interrelated procedures, with each written procedure being for a single person, into a larger process involving multiple people. The sections of a digital manual containing separate written procedures for an individual's use are now interlinked in a diagram showing a series of actions taking place to complete a complex process.

The authors consulted the professional literature for a single acquisitions workflow process for e-books and realized none exist because there are too many variables, including, but not limited to, how departments are organized and the number of staff employed. Although a specific ILS is not identified in the process maps, the use of a different one could affect the sequence of steps in comparison since systems have different capabilities and limitations. While it is possible for other libraries to use process maps constructed for the authors' library as a starting point to document their own e-book acquisition workflow models, the authors cannot address its scalability.

Related to scalability is how documenting and creating process maps can be sustained at the authors' institution. They found the process to be necessary but time consuming. Developing process maps in addition to the documentation was another component that requires a fair amount of time. The authors learned that once drafted, it is important to discuss the

maps with stakeholder staff members to confirm or suggest changes. Given their current staffing structure, the authors may choose to continue process mapping without stakeholders to minimize the impact workflow documentation can require of a person's time. They began their process by listing all the department's procedures that needed to be documented, and selecting what was most critical to be fully developed; in this case, it was e-book acquisitions. The authors will likely return to that list and continue to address procedures essential to the department's mission.

Though much attention in the literature is devoted to troubleshooting e-resources (summarized well by Carter and Traill), troubleshooting largely happens as a maintenance issue, external to the usual acquisitions process.[49] There may be initial quality concerns to consider as MARC records for e-books are loaded or accessed (matters such as missing or incorrect URLs, proxy issues, or catalog record errors) and the authors consider those as part of the set-up process completed by their ERA. Therefore, they have chosen to not include troubleshooting in their documentation or process maps in this paper.

Conclusion

The authors recorded an e-book acquisition workflow from a holistic perspective. They wove their case study of work undertaken at a mid-sized library in higher education into the wider literature in the areas of workflow and process mapping, highlighting the changes currently taking place in the landscape of e-acquisitions. An important takeaway from this process is the inclusion of stakeholder staff in devising the procedures they will then follow. Using this approach, the authors divided potentially complicated workflows into manageable chunks and think as a team about how the pieces fit together. By approaching e-book workflows from this perspective, the authors hope to provide their own staff with a sense of the big picture—how all of their individual processes contribute to the whole of the acquisitions process.

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Book Reviews

Elyssa M. Gould

Text, Lies and Cataloging: Ethical Treatment of Deceptive Works in the Library, by Jana Brubaker.
Jefferson, NC: McFarland, 2018. 158 p. $55.00 softcover (ISBN: 978-0-7864-9744-7).

The first thing that gave this reviewer pause was the title of this book. The 1989 movie *Sex, Lies and Videotape* and 1981 book *The Joy of Cataloging: Essays, Letters, Reviews, and Other Explosions* by Sanford Berman have similarly provocative titles.[1] The two books, however, are worlds apart in their content. How on earth can cataloging be sexy? The complex theme of deception is found in both the 1989 movie and Brubaker's 2018 book, thus the similar titles.

The second thing is that the idea of *deceptive works* as a classification has never crossed this long-time cataloger/librarian/book reviewer's mind. Deception, mixed with ethics and guidelines for responsible cataloging, are the book's main topics. Catalogers, unbeknownst to many in our field of librarianship, have a weighty responsibility when practicing original cataloging. We are responsible for deciding what a book or item is "about." This reviewer is responsible for originally cataloging all the theses and dissertations, and any locally published items or archives, for an academic library and takes this responsibility very seriously.

What happens when the information in a book is a lie? When a book is published as non-fiction and then is later discovered to be a fictional work, or partly fictional, who decides to change the access points and the descriptions in the bibliographic records? Should they be changed? Brubaker's *Text, Lies and Cataloging* attempts to grapple with this thorny issue.

The author begins with an excellent point: deception is something librarians should be mindful of with respect to collection development and collection management. Deception in literature has been around since people began to write and share information. These books are not unworthy for a collection; however, cataloging deceptive materials is more problematic and less straightforward. The scope of deceptive works in this book includes books from the English language from 1800 to the present day: memoirs, autobiographies, nonfiction, fiction, and poetry have been examined. Some of the examples in the case studies are literary classics. *In Cold Blood* by Truman Capote is examined. A current title is James Frey's *A Million Little Pieces*, which caused controversy in the publishing world when Oprah Winfrey chose it for her book club.

There is a brief section explaining cataloging terms. It includes a visual of an OCLC MARC record, which is helpful for non-catalogers. This section may date the book at some point. Cataloging rules, regulations, and guidelines are now a moving target. They are now seen as guidelines that are currently in flux, as Linked Data, Bibframe, and RDA are mixing things up. This constant fluctuation significantly impacts the ability to describe deception bibliographically.

There is a short philosophical section discussing the phrase "deceptive works," authorship, authenticity, and the veracity of a work. False names and literary hoaxes are discussed. The author raises the point that the *value* of a work could conceivably come from the deception itself. These are all challenges for catalogers as they attempt to describe works.

There is also a concise chapter concerning barriers to accurate cataloging. The questions of who can the cataloger can trust to accurately describe the work and who decides when a work is deceptive are examined. A section on codes and standards for descriptive cataloging is deliberated in depth. Access points, controlled vocabulary, the history of classification from Charles F. Cutter and IFLA, FRBR and RDA, subject entries, and the American Library Association Code of Ethics are discussed.

Possible cataloging approaches are promised in the remaining chapters, which include case studies. The four chapters of case studies provide the reader with a background introduction on each piece and then delve into each title in detail. These case studies' narratives are written with historical context in mind, including news articles and court cases. These case studies are highly readable stories and describe why each title is judged as deceptive. Each case study includes the authors' opinion on how their bibliographic records could be updated to include information on the scandals and/or deceptions for each one.

In conclusion, the author explains that once a cataloger has evidence that a work is deceptive, it must be clearly described in its respective bibliographic record. Brubaker adds the disclaimer that while her solutions will work in the MARC environment, many more questions arise in the ever-changing online environment (BIBFRAME world) we face in the future. She did an exhaustive amount of research when developing this book. There is a notes

section for each of the chapters plus comprehensive notes for each of the titles discussed.

Text, Lies and Cataloging may be used as a resource manual for catalogers as it provides background, context, and structure for decisions that must be made when cataloging deceptive materials. OCLC records are discussed in detail with regards to descriptive cataloging. The author includes her opinions on how a book might be cataloged, yet she mentions that this is her opinion and that there are sometimes multiple solutions.

This book is not just for catalogers. The important topic of ethics in librarianship and the perplexing idea of deceptive works should be a topic that is discussed widely in our field.

Text, Lies and Cataloging would be excellent in any library science core course curriculum. The book also functions as a resourceful decision-making tool, aiding librarians in learning more about deceptive works and guiding the decision-making process on how to handle cataloging them.—*Amy Parsons (parsons_amy1@columbusstate.edu), Columbus State University, Columbus, Georgia*

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Guide to Streaming Video Acquisitions (An ALCTS Monograph). Ed. Eric Hartnett. Chicago: ALA Editions, 2019. 120 p. $59.99 softcover (ISBN: 978-0-8389-1766-4).

Streaming media is prevalent, but it can be a daunting task for those in collection development and acquisitions to determine an appropriate way to provide access to it. This book is for those who have been hesitant to acquire streaming media or feel that they need to evaluate their current strategies regarding streaming media. The book's stated purpose "is to address the logistics of providing steaming video for the library" (1). The book breaks down the key aspects into ten chapters and includes bibliographic references and an index.

The volume opens with an explanation of the "Library's Role in Providing Streaming Video." This chapter thoroughly explains how videos are commonly used within libraries. It also discusses how these uses should be taken into consideration when determining whether streaming is appropriate and whether ownership or access is more important. The remaining chapters cover the basic aspects of acquiring streaming media, including sample workflows and collection development policies, business models and licensing, and practical aspects of discovery and use.

Most chapters provide a general overview suitable for a broad audience and can serve as a resource for that particular topic. Ballestro succinctly outlines and defines the "Business Models for Streaming Video" and provides use cases for each model plus pitfalls, providing the reader with an understanding of the factors that need to be considered before choosing a model. Authors Miller, Parks, and Trantham outline "Licensing Streaming Video," which includes "an explanation of the types of licenses available, descriptions of specific contractual languages that librarians should be aware of, and a few details about workflows" (39).

Those looking for a more in-depth study may not always feel satisfied, although several contributors provide some excellent resources for further study. "Streaming Video Discovery in Academic Libraries" highlights the challenges of discovery for a collection that is now virtual. The references in this chapter are excellent resources for further inquiry. While this chapter focuses on "some of the challenges faced by academic libraries," the author notes that "many of these considerations may be useful to public libraries as well" (47).

"Usage Analysis and Assessment of Streaming Video" by Gilbertson and Jiping Zou is a robust chapter covering more than just usage statistics, although COUNTER reports and their applications for streaming media are covered in detail. The authors cover return on investment and intangible values such as accessibility, discoverability, and mobile capability. Of particular interest is the section "User Engagement," which addresses "how the service meets users' expectations" (67).

Two chapters, "Classroom Use" and "Streaming Video Accessibility," focus on special challenges that should be considered. Wahl's chapter helps "those working with the format to have an understanding of the basic principles of copyright and exemptions such as the TEACH Act and fair use" (77). Milewski's chapter on accessibility walks the reader through the complex nature of captioning, interactive transcripts, audio description, and keyboard shortcuts and controls. Licensing "addressing accessibility features in licensing language" is highlighted as a key tool at the librarian's disposal (87). The strengths of these chapters are that they clearly define areas unique to streaming video that should be evaluated, and they further provide several solutions to consider.

Finally, the book concludes with a chapter on "The Future" of streaming video as it relates to their use in general. The author positions streaming media within the mainstream context and makes the prediction that "on-demand video streaming services will continue the steady destruction of traditional television" and that "the sales of films on optical discs will also continue to decline as video

streaming subscriptions and sales eviscerate the market for DVDs and Blu-ray Discs" (92–93). Higgins reminds the reader that these changes are "likely to have a significant impact on future library services" (92) and that "we will need to be willing to change just as quickly" (95).

Guide to Streaming Video is a solid introduction to the logistics of providing streaming video to academic and research libraries. Readers seeking more in-depth coverage on specific topics would benefit from reading published case studies and articles. Throughout the entire book, the editor and authors present clearly organized and well researched concepts that can be applied by institutions both large and small.—*Anna Seiffert (aseiffert@mines.edu), Colorado School of Mines, Golden, Colorado*

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