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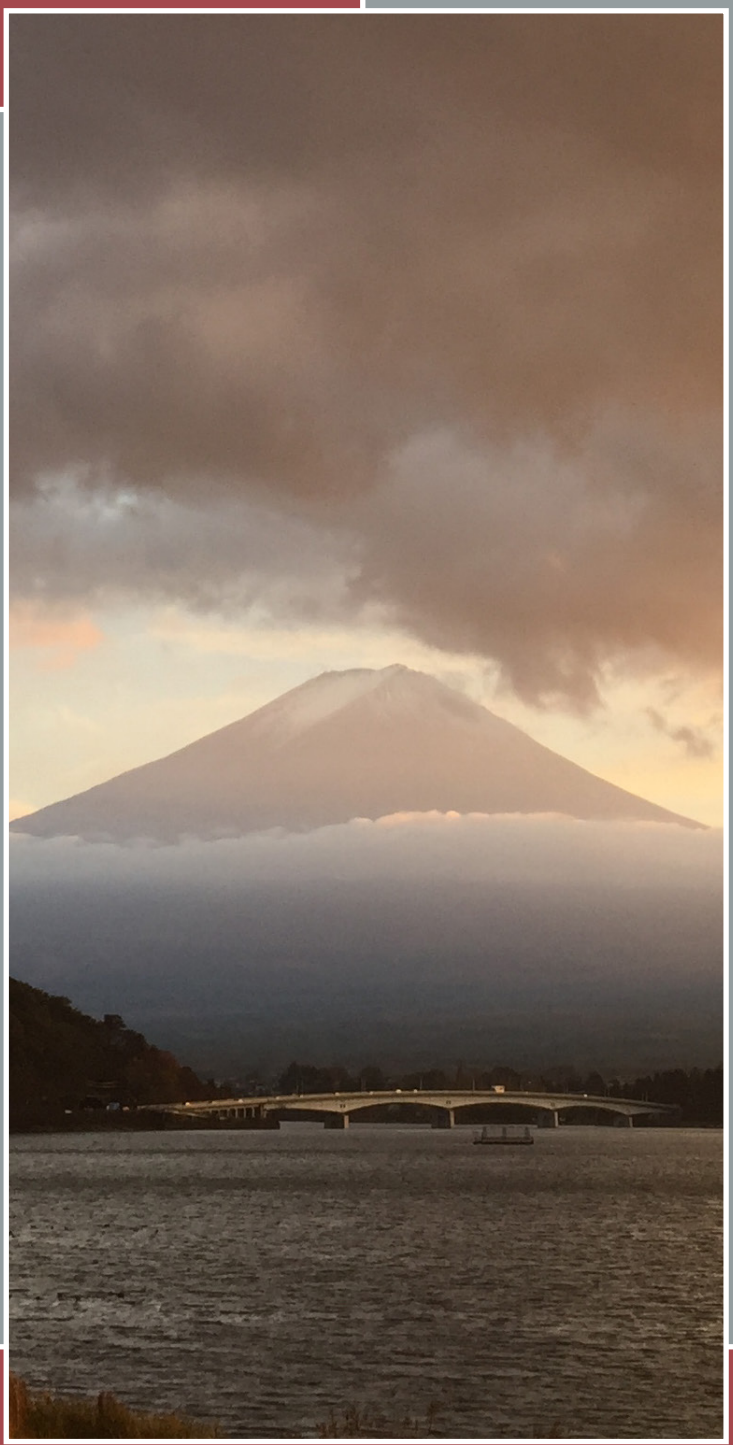

Core LEADERSHIP INFRASTRUCTURE FUTURES

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Cover image: "Mt. Fuji at dusk," Brooke Morris-Chott, October 2015.

Editorial

The New Year

The year 2020 seemed to be one in which things steadily continued to get worse, with each event more terrible than its predecessor. The pandemic has overshadowed everything, and has affected many aspects of our economy. The expression "do more with less" has added significance in our current situation. Budgets have been cut, staff have been laid off or furloughed, and others have had salary reductions. Our profession showed resilience, creativity, and determination in the face of great odds. New service models and ways of working emerged, and how libraries operate will be forever changed. We have successfully proven that we can work remotely. Virtual meetings and conferences are here to stay for a number of reasons, including holding down costs and enabling greater participation. Services like contactless pick up and going fine free were welcome additions and exemplify the spirit of community during a crisis. I personally learned the importance of advance disaster and emergency planning, which included a Zoom call with internationally recognized emergency and disaster planning expert Guy Robertson.

Many people were glad to see 2020 end and are hopeful for 2021. Each new year is seen as a fresh beginning and an opportunity to make changes, both personally and professionally. For libraries, the start of a new year might be the time to evaluate goals and plans to determine what progress has been made and what remains to be done. In technical services, the emphasis has been on areas such as collecting and disseminating electronic resources, quality assurance and database projects in resource description, and digital projects. These technical services functions made it possible to continue to serve our patrons, regardless of their location. We will emerge from this crisis, but when and how are still largely unknown. The expected timeframe to "return to normal" is continually revised in light of growing cases of COVID-19, the discovery of mutations of the virus, and uncertainty surrounding how the vaccine will be distributed and when. We are operating in the face of an uncertain future.

As a profession, we have repeatedly demonstrated our ability to respond to crises and other serious situations. Examples include Sidney Eng's account of how his library was operational within a short time following the 9/11 terrorist attacks, librarians in major cities being trained to administer Narcan, and libraries offering shelter and Internet access after natural disasters.[1] We can and will continue to provide services. Technical services in particular provides the infrastructure and support necessary to keep our operations functional.

Despite the challenges of 2020, there were also some bright spots. ALA has a new executive director, Tracie D. Hall, who was the keynote speaker at a virtual conference in my home state of New Jersey. Her presentation was insightful and uplifting, and she interacted with attendees. LITA, ALCTS, and LLAMA hosted the very successful Exchange virtual conference this past summer, and Core as a new ALA division has become a reality. For me, the bright spots that made me feel hopeful include being accepted into a faculty women's leadership and professional development program at the university where I am employed. I was also invited to speak to a library science class at the University of Denver

via Zoom. Additionally, I am working on a publication that stemmed from my experiences as a manager during the COVID pandemic.

I truly believe we will emerge from this crisis stronger, smarter and better prepared, and that leads to my overview of the contents of this issue of *LRTS*. Please note that there are no book reviews in this issue. Closures due to COVID and other disruptions prevented reviewers from completing assignments.

- In her paper "Fighting an Uphill Battle: Troubleshooting Assessment Practices in Academic Libraries," Lindsey Lowry explores the issue of tracking troubleshooting data for e-collection management. Her research included a survey of academic librarians who are currently involved in e-collection management to determine to what extent and for what purposes troubleshooting assessments are being carried out. Although many librarians are aware of the potential benefits of assessing troubleshooting data, there are obstacles to gathering, analyzing, and acting on those results.
- "A Large-Scale Collection Review with Faculty Collaboration: A Comprehensive View," by David Burke, Jeehyun Yun Davis, Christopher Hallberg, and Sarah Wingo, detail how Villanova University, in support of the university's strategic plan for research, launched a large-scale collection review at the beginning of 2017. The library recognized the importance of a systematic process for collection review, including a deselection process to keep the library collections healthy and relevant.
- Although The Ohio State University Libraries' Serials and Electronic Resources team tracked problem reports for electronic resources through a ticketing system, the system's functions to articulate the work involved in supporting such resources had not been fully investigated. The arrival of a new Electronic Resources Officer prompted a review of the type of statistics provided to management and identified an opportunity to more fully document reported problems and staff effort. A mechanism was created to highlight different types of problems through the application of a controlled vocabulary developed specifically for that environment. This process is detailed by Anita K. Foster in "A Controlled Vocabulary for an Electronic Resources Problem Reporting System: Creation, Implementation and Assessment."

Reference

1. Sidney Eng, "How Technology and Planning Saved My Library at Ground Zero," *Computers in Libraries* 22, no. 4 (2002): 28–34; Romeo Rosales Jr., "The Opioid Crisis and Administering Narcan in Libraries," *Public Libraries Online* (September 17, 2018), http://publiclibrariesonline.org/2018/09/the-opioid-crisis-and-administering-narcan-in-libraries, accessed December 27, 2020; Joel Rose, "For Disaster Preparedness: Pack A Library Card?," NPR's *Morning Edition*, August 12, 2013, https://www.npr.org/2013/08/12/210541233/for-disasters-pack-a-first-aid-kit-bottled-water-and-a-library-card.

Fighting an Uphill Battle

Troubleshooting Assessment Practices in Academic Libraries

Lindsey Lowry

Scholarly literature provides many examples of librarians who have assessed troubleshooting data in various capacities and demonstrated the benefits that can be gleaned from such an analysis. Though some studies have confirmed that troubleshooting data is often being tracked, the frequency with which that data is being assessed in libraries is not well established. For this study, the author surveyed academic librarians who are currently involved in e-collection management to determine to what extent and for what purposes troubleshooting assessments are being carried out. The results reveal that though many librarians can see the benefits of assessing troubleshooting data, the obstacles to gathering, analyzing, and acting on results are often too great to overcome.

The effective troubleshooting of electronic resource (e-resource) access problems is of paramount importance for librarians aiming to provide seamless service for library users. The complicated and intertwined nature of discovery services, link resolvers, knowledge bases, etc., makes fertile ground for access errors, and collection managers responsible for addressing e-access problems rely on a wealth of knowledge about how each of these systems integrate with one another to successfully resolve outages. For many libraries, users often report e-access problems through an online form, by e-mail, a dedicated ticket system, or by some other means for library staff to address and resolve. The abundant data that exists within these types of communications provides an opportunity for librarians to assess that data and use it to improve both troubleshooting workflow, access to e-resources, and overall service to users. While many libraries engage in ongoing data collection for various services, such as gate counts, circulation metrics, reference interactions, or instruction assessments, the extent to which libraries assess troubleshooting data or workflows and for what purposes is not well established.

For this study, the author created and distributed a survey (see appendix) intended to collect data from academic librarians to answer the following questions:

1. To what extent are librarians assessing troubleshooting data and workflows in academic libraries?
2. For what purposes are troubleshooting assessments carried out?
3. What barriers exist for librarians to perform such an analysis on troubleshooting data?
4. Is undertaking a troubleshooting assessment a worthwhile endeavor to improve services?

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Literature Review

Benefits to Mining Troubleshooting Data

A number of authors have analyzed troubleshooting data and published findings that demonstrate the benefits of performing a troubleshooting assessment. For instance, in the absence of a dedicated ticket tracking system for troubleshooting, Browning's team at Auraria Library at the University of Alabama examined e-mail chains from e-access problem reports to "answer some fundamental questions about the nature of Auraria's access problems."[1] As a result, Browning created a new "quarterly e-resources spreadsheet" in which student workers can systematically check for outages before they are reported. Furthermore, Auraria Library added additional "Report a Problem" links on the A-Z databases page and amended the link on their link resolver landing page, hoping to increase visibility, which ultimately led to more reports of outages from students and faculty. Browning also used the data from the study to advocate for a new position to help with e-resource access and noted that one clear conclusion of the study was that "troubleshooting needs more focused and dedicated attention."[2]

Like Browning, Wright studied outages that occurred over one calendar year and implemented changes to the troubleshooting workflow at the University of Michigan to proactively address frequently occurring access issues. More specifically, Wright created an "outage framework" with the implementation of a ticketing system and a controlled vocabulary to classify each of the incoming tickets. At the conclusion of the study, Wright opined that "no one institution can systematically rid itself of the kinds of errors seen repeatedly, across platforms, vendors and content delivery services."[3] Wright continued, "Improving our ability to describe errors, to capture examples of them and the attempts made to fix them, is the first part of what is sure to be an arduous but ultimately worthwhile process."[4]

Similarly, Goldfinger and Hemhauser used the resulting data from their study of troubleshooting tickets to propose projects at the University of Maryland, College Park, intended to mitigate future outages and access issues for users. These proposals include updating a local Frequently Asked Questions service page, wherein users could be directed to a "report a problem" link for certain types of outages, and make future changes if a more in-depth analysis revealed additional frequently occurring problems that could be alleviated by providing users with more information.[5] Goldfinger and Hemhauser also proposed adding standardized responses for staff to use in communications when resolving frequently occurring issues. Furthermore, a local internal troubleshooting guide for training purposes could enhance staff understanding of certain issues and provide tips for troubleshooting. In addition to providing proposals for enhanced services as a result of the study, Goldfinger and Hemhauser concluded that "Similar future studies at other institutions can surely also suggest local enhancements to optimize the existing troubleshooting framework at each given institution."[6] They encourage other librarians to conduct their own local analyses.[7]

Brett at the University of Houston, Lowry at The University of Alabama, and Gould and Brett at the University of Tennessee, Knoxville, and Texas A&M University respectively, examined troubleshooting data in a somewhat different light, wherein rates of access problems across multiple research institutions were used to form a comparative analysis in three different studies.[8] Brett first concluded that it was indeed possible to perform a comparative analysis between institutions when troubleshooting data is analyzed, and illuminated similarities and differences in a comparison between two universities, highlighting where improvements could be made to the University of Houston's services. For example, Brett discovered that the University of Houston had more tickets concerning problems with EZProxy and IP addresses than the University of Maryland, College Park. Proposed improvements included better tracking of EZProxy changes, and adding more information and "report a problem" links in key areas of the library's website to serve patrons at the point of need and hopefully minimize EZProxy or IP related outages.[9] In 2020, Lowry built upon Brett's study to include a third institution in a comparative analysis and iterated that as a result of both a comparative and local analysis of troubleshooting tickets, the best course of action for The University of Alabama Libraries would be to "empower public services faculty and staff to better understand and report access issues so that frustrations are minimized."[10] Lowry indicated that the results of the study "are highly indicative that research libraries experience some types of access problems at approximately the same rates," and that efforts to improve discovery should be "at the forefront of the minds of librarians when communicating and negotiating with vendors."[11] Finally, Gould and Brett compared rates of access problems at the University of Tennessee and Texas A&M University, ultimately advocating for a standardized or controlled vocabulary to be establish by librarians and the National Information Standards Organization (NISO) to foster collaboration between institutions and to simplify the process of comparing outages across institutions to improve e-access for all library patrons.[12]

Taking a slightly different approach, Ashmore and Macauly of Samford University analyzed unfilled interlibrary loan (ILL) requests to detect patterns.[13] As a result, workflow improvements implemented included increased access to ILLIAD, wherein librarians could download reports into Excel for further analysis, rather than relying

on e-mail chains. The study also identified groups who may need additional library instruction and improved collaboration among the different library departments. Moreover, Ashmore and Macauly examined potential interface design changes that would increase wayfinding for patrons and improved staff training on troubleshooting. Ashmore and Macauly deemed the project successful with a number of benefits, and that "this process was a service opportunity offering a good way to establish positive relationships with users by saving their time."[14]

Considering the many service benefits that are demonstrated in the literature, Samples and Healy were straightforward in their own recommendation: "Librarians should take the time outside of troubleshooting to mine their own data regarding access failure to improve electronic resource troubleshooting workflows."[15] Likewise, perhaps Wright elucidated the benefits of analyzing troubleshooting data the most robustly: "With enough data gathered through systems like Footprints and shared with both vendors and other institutions, libraries stand poised to improve the functionality of e-resources, not just for their own patrons, but for patrons everywhere."[16] Indeed, Goldfinger and Hemhauser, Wright, and Brett each noted that obtaining more robust data on e-access outages is a key component to communicating with vendors about access problems.[17] Carter and Traill also opined that "tracking complicated troubleshooting leads to a more sophisticated understanding of both the frequency of various problem types and their levels of complexity," noting that in short, the benefits of implementing a formalized tracking of troubleshooting problems "helps to ensure that problems are resolved."[18] Carter and Traill remarked that "reviewing data on reported issues is critical for revising and improving the workflow of troubleshooting," and discovered that methodical and detailed problem tracking plus periodic and ongoing analysis in conjunction with their recommended training strategies provides the best possible service environment for library patrons.[19]

Barriers to Analyzing Troubleshooting Data

Though authors have advocated for librarians to analyze local troubleshooting data and workflows, the literature also highlights many barriers. Samples and Healy indicated that 56 percent of Association of Research Libraries (ARL) libraries surveyed were either not tracking troubleshooting data or had an unclear method for doing so, meaning that no troubleshooting assessment occurred in these instances. They remarked that the lack of troubleshooting data tracking at ARL libraries likely means that the troubleshooting practice has few quality-control measures in place and "decreases the return on investment for these electronic resources." [20] The amount of time and lack of tools required to perform such an analysis was cited as one barrier to analyzing troubleshooting data. In fact, interviewees for Samples and Healy's study indicated that among the barriers to creating proactive troubleshooting workflows "finding the time to pull details from emails or correlate information in Excel from forms with disparate fields or fields that have changed over time" weighed heavily as problematic.[21] Browning indicated that implementing software used for tracking requests for troubleshooting (one that could potentially provide robust data for analysis) meant more time and resources than Auraria Library's staff could offer at the time of the study.[22] Rathmel et al. likewise indicated that survey respondents reported staff time and budgets were impediments to implementing robust tracking tools for troubleshooting.[23]

Furthermore, while Rathmel et al. and Heaton found e-mail to be the most frequently used tool for troubleshooting, it lacks the functionality for easy archiving and reporting of metrics necessary for an in-depth analysis of the data within. [24] Rathmel et al. described e-mail as "ubiquitous" and of no extra cost to institutions, unlike specialized ticket tracking systems or customer relations management (CRM) tools that may provide robust data but are otherwise unobtainable. [25] Samples and Healy state that "counting emails is easy, but figuring out what the email is really reporting and using emails to expose large patterns or repeated problems with a particular vendor can be prohibitively time consuming." [26] Borchert detailed the difficulties her team faced when using e-mail to track and respond to requests for troubleshooting: "E-mail messages can be buried in an inbox full of other messages, and because several people received the e-mail, no one knew when someone else had already responded to it. Also, if we had a pattern of access problems, it was not readily apparent because the old e-mails were deleted once the immediate problem was handled."[27] Ashmore and Macauly eventually switched from using e-mail to analyze unfilled ILL reports to downloading reports from ILLIAD that enabled greater examination of information than the original e-mail chains provided. [28] Finally, despite the fact that e-mail was found to be one of the most widely used tools for tracking data related to troubleshooting, Rathmel et al. found that ticketing systems that provided better functionality for data tracking were not widely implemented in libraries, with only 26 percent of respondents indicating that such a software was in place.[29] As it related to the complicated nature of e-resources workflows, Collins reiterated that "workflow processes should not be memory-bound or isolated within individual silos such as e-mail; otherwise, ineffective knowledge management is likely to result."[30]

Interviewees in Samples and Healy's study likewise indicated that analyzing troubleshooting data is not straightforward, as sometimes the problem and resolution are not

clear from the data provided in the tickets.[31] Wright indicated that detecting patterns within troubleshooting data can be difficult, and "attributing outages to the correct source of the problem swiftly becomes a point of contention."[32] Brett, Goldfinger and Hemhauser and Wright all indicated difficulty in categorizing tickets to determine patterns.[33] In fact, Brett, who set out to compare rates of access outages between two institutions, noted that it is necessary to have a standardized vocabulary of outage types to categorize each ticket instance, such as was developed by Goldfinger and Hemhauser, to enable vendors to address them on wide scale.[34] Goldfinger and Hemhauser's methodology in examining troubleshooting ticket data included a team of library staff determining a controlled vocabulary for access outage types, and required the team to reach a consensus about each problem report before classifying it under a specific heading. Likewise, Goldfinger and Hemhauser note that a lack of a standardized, controlled vocabulary in the discipline made comparisons across institutions impossible. Browning indicated that the classification "Category of Problem" was vague and subjective, but that a controlled vocabulary to classify tickets is what made the analysis worthwhile.[35]

Method

For this study, the author created a survey using Qualtrics with questions related to the assessment of troubleshooting data in libraries. The author requested that only one member from each institution respond to the survey to prevent multiple responses from the same library. Furthermore, participants were asked to indicate if they were currently employed at an academic library in higher education. Those participants who indicated "No" were directed to the end of the survey and excluded from the sample. Participants were directed in a specific path within the survey according to whether they indicated that an assessment of troubleshooting data had been conducted at the respondent's library. If respondents indicated that their institution did not perform data analyses on e-access problems or troubleshooting workflow, they were directed to later questions in the survey, and skipped questions that asked more information about a data analysis. Additionally, only the survey questions about demographics were required, so response rates to individual questions within the survey vary.

The survey was distributed to four library professional discussion lists: NASIG's SERIALST listserv (serialst@simpleslist.com); the Electronic Resources in Libraries ERIL listserv (eril-l@lists.erl-l.org); the ALCTS E-Resources listserv (alcts-eres@lists.ala.org); and the American Library Association's University Libraries section listserv (uls-l@lists.ala.org). By choosing these discussion lists, the author hoped to target those library professionals who both work in academic libraries and who also actively work to troubleshoot e-resource access problems as part of regular job responsibilities. The study was approved by the Institutional Review Board of The University of Alabama, and the author collected responses for fourteen days in June 2020. A total of 174 responses were collected, of which 143 were complete. The results presented here represent an analysis of those completed responses.

Table 1. Full Time Enrollment of institutions. *N* =143

FTE	*n* =	% of sample
0–9,900	86	60
9,900–19,800	26	18
19,800–29,700	15	10
29,700–39,600	9	6
39,600–49,500	3	2
49,500–59,400	3	2
> 59,400	1	<1

Results

Demographics

All of the participants in the sample indicated that they are currently employed in academic libraries. One response was excluded since the participant indicated employment at another type of library.

The approximate Full Time Enrollment (FTE) of schools represented in the sample ranged from 200 students to 110,000 (see table 1). The majority of responses reported FTE of between 200 and 9,900, making up 60 percent (*n*=86) of the sample. Additionally, most respondents indicated that their libraries were not ARL members for a rate of 74 percent (*n*=106).

Tracking and Data Analysis

Of 143 responses, 51 percent (*n*=73) indicated that e-access problems were being tracked in some way. Additionally, of the 73 respondents who indicated that e-access problems were tracked, the most frequently cited tool used was e-mail at 61 percent (*n*=45), followed closely by SpringShare products (LibGuides/LibAnswers) at 47 percent (*n*=34). No respondents indicated using an ILS system to track troubleshooting data, and twelve respondents selected "Other," indicating tools like Trello, Sharepoint, and home-grown solutions (see figure 1).

When asked what types of data were tracked, respondents provided a variety of answers. Some of the more

common types of data cited were the date and time of the report, who reported the problem (faculty, staff, or student), who resolved the problem, and the vendor involved. Some rather unique answers included tracking the access points or origin of the user's request, IP ranges of the reporting user, and time spent by staff resolving the problem. Interestingly, while some respondents indicated perhaps only one or two data points were tracked, other respondents indicated large amounts of data points being recorded for each instance, with some including eight to ten data points being tracked per issue. Other participants indicated that they used less formality in tracking data types, such as only tracking the number of reports received in a given timeframe or only the resource and vendor name involved. Some participants indicated that e-mails or tickets were filed for later analysis, and had not established formal data points to track.

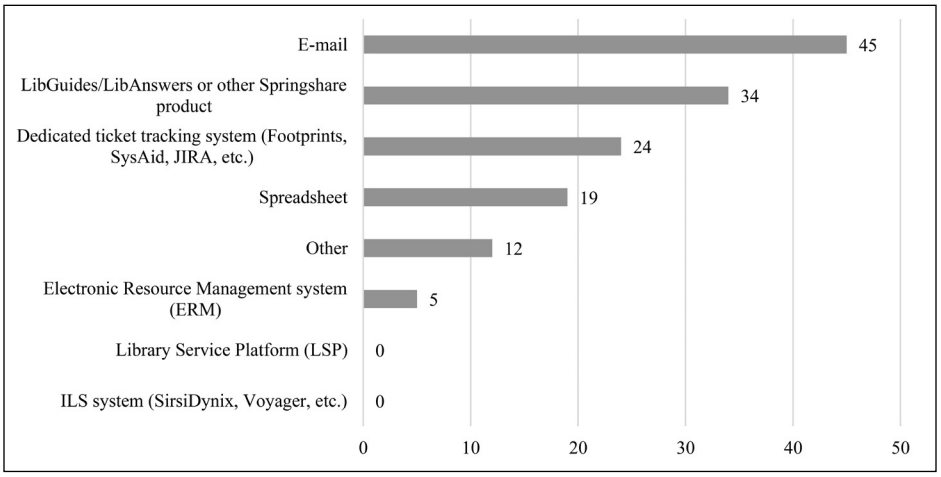

Figure 1. Tool types used by respondents (*N* = 73)

E-Access Problems Assessment

Of the 143 respondents, fifteen (10 percent) indicated that a formal analysis of e-access problems had been conducted in the past, and 19 percent (*n*=27) indicated uncertainty of whether a formal analysis had occurred. The affirming respondents were asked for what purpose an analysis was undertaken and multiple options were provided. The most common purposes indicated for an analysis were "To identify common points of failure" (*n*=10), followed closely by "For reporting purposes" (*n*=7) (see figure 2). Five of the fifteen respondents indicated that an analysis had been undertaken for training purposes, to justify staffing decisions, and/or to identify gaps in the troubleshooting workflow. Two respondents indicated that analyses were performed to present or publish the findings, while one respondent indicated that data was analyzed for communicating with vendors about renewals. Moreover, 53 percent (*n*=8) of the formal analyses reported were undertaken within the last year, with one respondent indicating that an analysis had occurred more than five years ago.

Eleven respondents (73 percent) indicated that an assessment of e-resources access reports was beneficial to users and services, with one respondent indicating that an analysis was not beneficial. Three respondents were uncertain whether benefits were realized as a result of an assessment. Only one respondent indicated that comparative analysis across more than one institution had been undertaken, while ten (71 percent) of the remaining respondents indicated that a comparative analysis of troubleshooting instances might be worthwhile in the future.

Local Troubleshooting Practices Assessment

For survey questions regarding an assessment of troubleshooting practices, rather than e-access problem reports, most participants responded that no assessment of local troubleshooting practices had ever been performed at 70 percent (*n*=101) of the full sample, and 20 percent were uncertain whether one had been performed. The most common indicated reason for undertaking an assessment of troubleshooting practices was to identify gaps in the troubleshooting workflow at 23 percent (*n*=9) and for training and/or documentation purposes, both at 20 percent (*n*=8) as shown in figure 3. Most assessments of this type were performed within the last year (31 percent or *n*=4) or the past three years (46 percent or *n*=6). Additionally, most of the thirteen responses indicated that a troubleshooting practices assessment resulted in improved services at 85 percent (*n*=11).

Barriers and Future Directions

The primary barrier to performing a troubleshooting analysis was time/staff constraints, with 106 respondents, or 74 percent, indicating difficulty in this area. The second most common barrier was "difficulty in organizing or obtaining data about problem reports," with 41 percent (*n*=58) of respondents noting this as an obstacle to performing a troubleshooting assessment. The third most common reason was the lack of appropriate tools to conduct an assessment (see figure 4). For those respondents who selected "Other," additional trends emerged as common barriers, including

the lack of a request for such an analysis from administration, lack of interest on the part of staff and administration, or resistance to beginning a new project. Of the 143 respondents, 60 percent (n=86) indicated a decisive interest in performing or repeating a troubleshooting assessment in the future, and just 6 percent (n=8) indicated no interest.

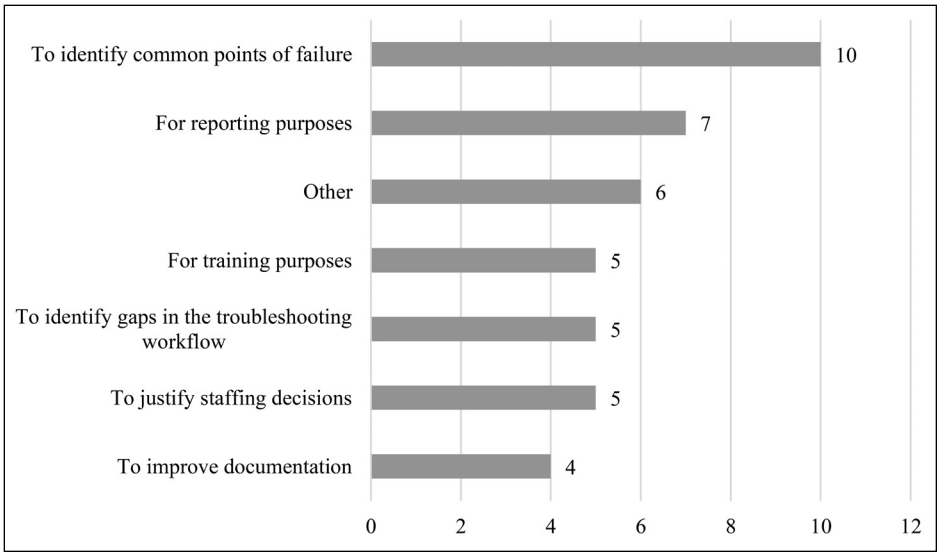

Figure 2. Purposes for an Analysis of E-Access Problems (N = 15)

Discussion

Though the professional literature establishes that there are many returns to be gained from an assessment of local troubleshooting metrics and data, the results of this study demonstrate that very few libraries are actually engaging in troubleshooting data assessment, though many actively collect or track the data necessary for an analysis. Specifically, this study shows that a large portion of troubleshooting data is being tracked (51 percent of the sample), yet only 10 percent of librarians reported using data for assessing e-resource access problems and 9 percent for assessing local troubleshooting practices. More in-depth study is needed to understand more clearly why a majority of libraries track troubleshooting data, if not for assessment purposes.

Likewise, the results of this study are highly indicative that many significant constraints prevent librarians from taking a deep dive into data related to troubleshooting, even though many respondents expressed interest in conducting a future assessment. More specifically, the limitations of time and staffing, plus the lack of available tools to collect and organize data, prevent librarians from performing analyses that may lead to improved services. In fact, all the barriers represented in this survey were cited by multiple respondents as problematic, suggesting that there are multiple barriers deterring librarians from undertaking a troubleshooting assessment project, though some barriers were more frequently cited than others. Interestingly, many barriers reported by respondents are more local concerns rather than broader concerns, such as a currently disorganized or transitioning workflow for resolving and tracking problems, and individual perceptions that a study of reports would not yield any new information. At least one respondent reported that there are no barriers or difficulties preventing an assessment project. In fact, the comments from participants about additional barriers provided compelling evidence that the decision to undertake a troubleshooting assessment project is very specific to an institutional need. Librarians seem to assess troubleshooting data with a specific goal to address a need or concern rather than on a vague, exploratory basis, and do not want to exert great effort without the promise of returns in regards to a troubleshooting assessment.

The survey results demonstrate that email is the most consistently used tool for troubleshooting in this study, as it was in studies by Heaton and Rathmel et al.[36] The persistence of e-mail as the most ubiquitously used tool for troubleshooting is clear: troubleshooting largely involves effective communication, and e-mail is almost universal for interoffice correspondence. However, synthesizing the contents of an e-mail chain and gleaning organized, usable data is no small task. While good communication is paramount to a successful patron interaction and troubleshooting resolution, tools designed primarily for communication do not provide the luxury of easy data collection and analysis. Likewise, dedicated ticket tracking systems that could provide a more sophisticated level of data organization were used by only 24 percent of respondents, supporting Rathmel et al.'s notion that ticket tracking systems for e-resources troubleshooting are not widely implemented, despite the fact that those types of systems often provide a more robust way to collect and report data than e-mail.[37] Samples and Healy found that a higher percentage of ARL libraries (43 percent) indicated using ticket tracking system for troubleshooting, demonstrating that ARL libraries particularly, seem to have easier access to more robust troubleshooting and data tracking tools.[38] However, as Browning notes, the time and staff required to implement a robust ticket tracking system is greater than some libraries can take on, which may explain

why ticket tracking tools have not been more widely adopted.[39]

Of the fifteen respondents who indicated that an assessment had taken place, the most frequently cited reason for it was to identify common points of failure, mirroring the goals of many of the studies cited here. More specifically, this result suggests that most libraries assess troubleshooting data to find and minimize frequently occurring problems and/or create proactive measures to reduce common access issues, as has been done in many published studies. The second most common reason for an assessment, "For reporting purposes," gives rise to potential areas of additional study. For instance, future studies might consider how many libraries report troubleshooting data and metrics to administration or governing bodies and what is done with the reported data. The author posits that perhaps, in some cases, when troubleshooting data are reported to other bodies, the data could be assessed outside the knowledge or control of the librarians who gathered the data or be stored for the potentiality of future assessments.

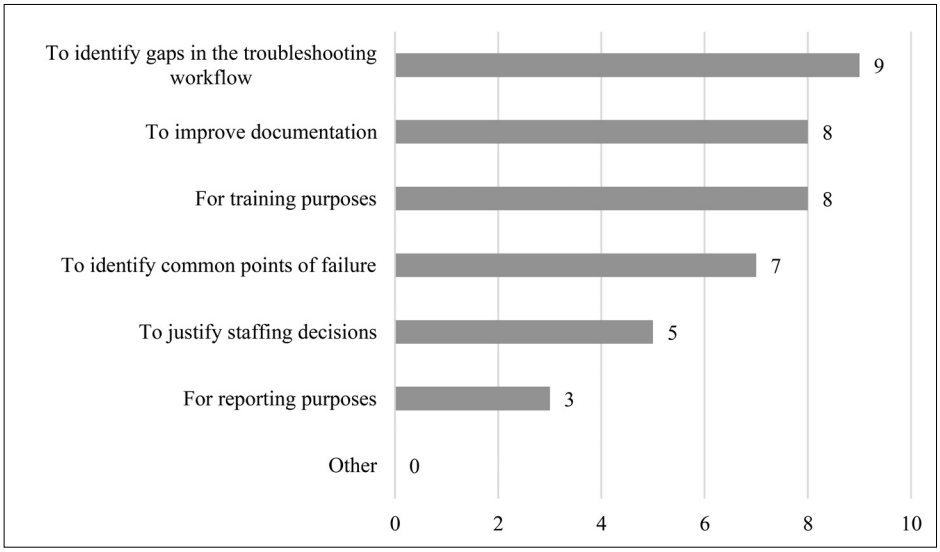

Figure 3. Purposes for an Assessment of Troubleshooting Practices (*N* = 13)

Moreover, 73 percent of respondents who had conducted a troubleshooting analysis indicated that services or workflow had improved as a result of such a study, and 94 percent of respondents indicated interest in performing a future assessment. The literature and the results of this study support the idea that troubleshooting data assessment is a worthwhile endeavor with desirable results, but with often insurmountable obstacles to obtaining those results. A future study might more closely examine the specifics of how troubleshooting and e-access has improved following an assessment so that librarians could see tangible impacts of the work to assess troubleshooting data. In fact, a pre- and post-assessment of troubleshooting tickets to see the efficacy of measures undertaken to improve services would be ideal for those hoping to learn if goals had been obtained. A study that can demonstrate measurable impacts on services would make an excellent addition to the existing literature on troubleshooting studies.

Interestingly, only one respondent indicated that data had been used for a comparative analysis with other institutions. The literature demonstrates that comparing rates of e-access problems across institutions may provide benefits for libraries at large, rather than simply local analyses. However, the lack of tools, time, and staff available to perform local analyses, as cited in this study, are enough to deter a large percentage of librarians from assessing local data, much less from making comparative analyses. Nonetheless, ten out of fourteen respondents indicated that a comparative analysis between institutions might be worthwhile. It is important to have data related to potential widespread or ongoing access concerns when communicating with vendors about problems, and comparing data across institutions could reveal industry-wide concerns to be addressed. In fact, Goldfinger and Hemhauser state that "if more libraries determined the external causes of access problems, libraries might be better able to work with vendors to prevent the problems outside of libraries' control" and advocate for a standardized vocabulary to classify types of outages across institutions.[40]

Finally, the functionality or failures of e-resources are an important consideration when assessing library and resource value and return on investment. One study participant indicated that troubleshooting assessment data was used when negotiating lower subscription costs and hosting fees with vendors. Indeed, the data from troubleshooting reports could help librarians demonstrate a resource's value if no troubleshooting tickets exist for the resource and if multiple problems were reported. Moreover, the number of troubleshooting tickets answered in a given time period, a common metric collected by librarians in this study, can help demonstrate the value of staff time spent helping to resolve problems. Browning used troubleshooting data at Auraria Library to advocate for a new Electronic Resources Librarian position to handle some of the workflow needed to effectively respond to and resolve e-access problem reports.[41]

Conclusion and Future Directions

This study shows that while an assessment may provide tangible benefits to libraries, the obstacles to successfully complete one may be too great to overcome. However, if librarians responsible for e-collections management choose to assess troubleshooting instances and workflow, efforts to make such an assessment need not be so prohibitive. For those librarians unsure if an assessment would be worthwhile, considering the needed time and resources, the author suggests creating measurable and obtainable goals as a start, and then deciding it is worth pursuing in consideration of the required staff time and effort. The author believes that although there is much to be gained, conducting an assessment project is a highly localized decision that should not be made without great care and consideration.

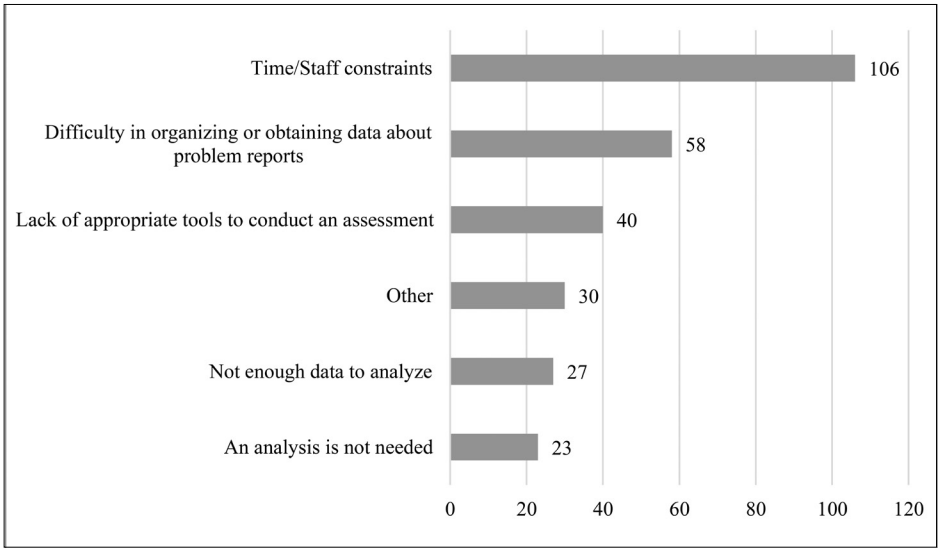

Figure 4. Barriers to Performing a Troubleshooting Assessment (*N* = 141)

Additional studies might take a more extensive examination of what librarians who have performed such troubleshooting assessments have done to conquer any obstacles. The author also encourages librarians who set out to assess troubleshooting data and practices to continue publishing, presenting, and comparing data to capture trends over time and set examples for other librarians to follow. The more librarians analyze the types of outages experienced, the better prepared we may be as a community to serve our library patrons, communicate with library vendors about services rendered, and maximize the return on investment from e-resources management.

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Appendix

1. Are you currently employed at an academic library in higher education?
   - ○ Yes
   - ○ No
2. What is your school's approximate full time enrollment (FTE)? _____
3. Is your library a member of the Association for Research Libraries (ARL)?
   - ○ Yes
   - ○ No

Definitions

The following questions will assess the extent to which your library has collected and analyzed data related to troubleshooting of e-resource access problems.

For the purposes of the study, the following definition of terms will apply:

Reports of e-access problems: A report received by library staff and originating from a library user in which the user informs staff that he or she is unable to access an electronic resource. This communication is often transmitted via a web form, ticketing system, e-mail, telephone, or the like.

Local troubleshooting practices: The workflow of how a library receives and resolves reports of e-access problems

Track reports: Recording data or information related to user reports of e-access problems in an archived or historical manner. E.g., An Excel spreadsheet containing data about troubleshooting tickets as they occurred over time.

4. Does your library track reports of e-access problems?
   - ○ Yes
   - ○ No
   - ○ Not Sure
5. What types of tools does your institution use in order to track reports of e-access problems? Choose all that apply.
   - ○ E-mail
   - ○ Spreadsheet
   - ○ Dedicated ticket tracking system (Footprints, SysAid, JIRA, etc.)
   - ○ LibGuides/LibAnswers or other Springshare product
   - ○ ILS system (SirsiDynix, Voyager, etc.)
   - ○ Library Service Platform (LSP)
   - ○ Electronic Resource Management system (ERM)
   - ○ Other _____

6. In a few words, please describe some of the types of data or metrics that are tracked: (e.g., Vendor involved, time to resolution, type of problem, etc.)___ _____
7. Has a formal analysis of reports of e-access problems ever been conducted at your institution?
   - ○ Yes
   - ○ No
   - ○ Not Sure
8. For what purpose(s) was an analysis of reported e-access problems performed? Choose all that apply.
   - ○ To identify gaps in the troubleshooting workflow
   - ○ To identify common points of failure
   - ○ For reporting purposes
   - ○ To justify staffing decisions
   - ○ For training purposes
   - ○ To improve documentation
   - ○ Other _____
9. Approximately how long ago was the most recent analysis of reports of e-access problems performed?
   - ○ Within the past year
   - ○ Within the past three years
   - ○ Within the past five years
   - ○ More than five years ago
   - ○ Not sure
10. In your opinion did the results of an analysis of reports e-access problems lead to improved troubleshooting practices and/or improved services for your users?
    - ○ Yes
    - ○ No
    - ○ Not sure
11. Have the results of an analysis been used to compare with that of any other institutions? (including consortial partners, branches, and/or peer institutions)
    - ○ Yes
    - ○ No
    - ○ Not sure
12. If no, in your opinion, would a comparative analysis of reported e-access problems between institutions be worthwhile?
    - ○ Yes
    - ○ No
    - ○ Maybe
13. Has a formal assessment or analysis of local troubleshooting practices ever been conducted at your institution?
    - ○ Yes
    - ○ No
    - ○ Not sure
14. For what purpose(s) was an assessment or analysis of local troubleshooting practices performed? Choose all that apply.
    - ○ To identify gaps in the troubleshooting workflow
    - ○ To identify common points of failure
    - ○ For reporting purposes
    - ○ To justify staffing decisions
    - ○ For training purposes
    - ○ To improve documentation
    - ○ Other _____
15. Approximately how long ago was the most recent assessment of local troubleshooting practices performed?
    - ○ Within the past year
    - ○ Within the past three years
    - ○ Within the past five years
    - ○ More than five years ago
    - ○ Not sure
16. In your opinion did the results of an assessment of local troubleshooting practices lead to improved workflow and/or improved services for your users?
    - ○ Yes
    - ○ No
    - ○ Not sure
17. What barriers or difficulties in analyzing reports of e-access problems or local troubleshooting practices exist at your institution? Choose all that may apply
    - ○ Time/Staff constraints
    - ○ Difficulty in organizing or obtaining data about problem reports
    - ○ Not enough data to analyze
    - ○ Lack of appropriate tools to conduct an assessment
    - ○ An analysis is not needed
    - ○ Other _____
18. Would you consider performing an assessment of troubleshooting activities or reported e-access issues in the future? (If you have already conducted an assessment, would you consider performing another in the future?)
    - ○ Yes
    - ○ No
    - ○ Maybe

Notes on Operations

A Large-Scale Collection Review with Faculty Collaboration

A Comprehensive View

David Burke, Jeehyun Yun Davis, Christopher Hallberg, and Sarah Wingo

Villanova University's Falvey Memorial Library developed a multiyear comprehensive and strategic collection review of print monographs. In this paper, the authors focus on the operational components of the project, such as generating potential deselection lists with GreenGlass, convening working groups to plan the project, developing strategies for faculty outreach and faculty collection review, and analyzing deselection and retention data. The authors share decision-making processes as well as lessons learned that were involved in the project design and implementation phases throughout the extensive collection review project.

Villanova University is known for its prestigious program of teaching and learning. In recent years, the University has increased its offering of doctoral programs and research activities, positioning itself to become a dynamic research university. In support of the University's strategic plan for research, Falvey Memorial Library, as the University's main library, launched a large-scale collection review at the beginning of 2017. The Library recognized the importance of a systematic process for collection review, including a deselection process to keep the library collections healthy and relevant.

The project targeted print monographs, excluding government documents and any other non-book monographs such as DVDs since they comprise the majority of Falvey's physical collections. Regular review and deselection of physical collections are vital to keeping those collections current. This activity removes outdated texts and makes space for more current scholarship.

The University Librarian (UL) chose GreenGlass as the collection analysis tool for this project. GreenGlass is a product of OCLC's Sustainable Collection Services (SCS) division. It reviewed over 500,000 monographic volumes based on the Library's deselection criteria, described in the Project Implementation section below. The tool helped to generate several review files, using Library of Congress Classification (LCC). These files were then assigned to the appropriate subject librarians for further review for collection retention. After the subject librarians completed their review, the files were posted for faculty review on the project website. Involving faculty in the collection review posed various challenges, such as significant delays in the deselection process and faculty resistance toward the deselection project in general. Nonetheless, the Library strongly believed that collection review should be a collaborative process between librarians and faculty, and involving faculty feedback in the project was important. This paper explores the extensive processes that went into executing this large-scale collection review project in detail, ranging from data extraction to forming working groups, to faculty outreach, and to designing the monthly schedule of faculty review. It heavily focuses upon the planning and designing of the project and various operational components that were required to manage it effectively and efficiently.

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Literature Review

Many papers addressing collection review analyze projects performed by the authors' respective academic libraries. These papers generally provide the reason for the review, the process the authors followed to deselect titles, and lessons learned from the experience. A common example of this type of literature is Murphy's "Assessing University Library Print Book Collections and Deselection: A Case Study of the National University of Ireland Maynooth."[1] This paper describes the review process, how the library began reviewing the hard sciences, how the author attempted to earn approval from the faculty, and concluded with a discussion of the advantages of assuring transparency during the process.

Zanin-Yost and Ginanni discuss a similar project at Western Carolina University's Fine Arts Library.[2] After reviewing the deselection process, the authors stress the importance of deselection practice as part of collection management strategies to maintain a well-used library collection. They also emphasize the significance of collaboration among librarians and staff in technical services, liaison department, and circulation in addition to faculty.

Some papers offer suggestions regarding how to approach a deselection project. A common approach is to divide the overall review into smaller projects targeting specific subject areas and/or formats. In "High-Yield, Low-Risk Deselection in an Academic Library," Giffin describes the weeding project at Concordia University (Montreal), concentrating on deselecting multiple copies, government documents, microforms, and print materials duplicated by e-books.[3] Olivia describes a project at Adelphi University that included actively replacing discarded titles with their electronic equivalents.[4] Griffin and Olivia both stress that librarians should ensure that their collections need a title before replacing a book with its electronic equivalent.

Since library weeding projects are rarely popular with users—especially faculty— some papers made suggestions on how to prepare for that reaction. Zanin-Yost and Ginanni advise creating a collection policy document before starting a deselection project.[5] Demas and Miller strongly encourage libraries to establish a collection policy and laud the benefits of having such a policy for both libraries and their various stakeholders. They state, "A policy should both present a clear argument to campus constituents and invite their participation in the planning process."[6] Similarly, before starting a series of targeted weeding projects at Concordia University (Minnesota), a policy was developed to help facilitate and guide faculty participation.[7]

Other papers address how to handle faculty reactions after a weeding project commences. Trail encourages presenting changes and decisions based on logic and data when communicating with users, but warns, "Having objective facts and figures does not always preclude protest from anxious faculty."[8] Some faculty will oppose the removal of any books on principle, obstinately adhering to the "just-in-case" approach to library collection development. In his blog post entitled "Amber," Seeber responds to common combative faculty complaints about library weeding he has heard.[9] DeMars, Roll, and Phillips describe their library's experience with including faculty in a deselection project at California State University, Fullerton (CSUF).[10] Their library provided circulation data to faculty and permitted them to contest some weeding decisions. After the initial pilot project in which faculty retained 1,716 books out of 1,744 (over 98 percent retention), the library modified the faculty review process to mandate providing a reason for retention requests. This process allowed librarians to differentiate between the needs of the academic department and the needs of individual professors regarding book retention.

GreenGlass has become an increasingly popular tool for collection reviews. DeMars, Roll, and Phillips note that CSUF used GreenGlass for their deselection project, discovering that the vast majority of their library holdings were published between 1960 and 1980. They comment, "This analysis revealed what many in the library already knew: much of the print collection was out of date and had not circulated in some time."[11] CSU, Stanislaus also used GreenGlass for the trial project for the political science collection, as described in Held's "Curating, Not Weeding."[12] The library used GreenGlass to generate review files, and librarians physically reviewed every title on the list afterwards to decide what to withdraw. In her paper, Snyder describes how Rollins College used GreenGlass to review its engineering collection. She claims that GreenGlass data "forced us to determine and quantify the attributes of books we wanted to consider for withdrawal."[13] A total of 97.5 percent of the books that GreenGlass data identified as withdrawal candidates were approved by subject librarians.

There are more general resources available for libraries regarding collection reviews that do not concentrate on a specific institution's actions, but rather speak to collection review more broadly. Lugg and Fischer provide strong arguments on the need for collection review projects, especially in regard to library space.[14] They assert, "Not only are library users being crowded out by reading material, they are being crowded out by unwanted reading material!"[15] McAllister and Scherlen argue for librarians to be cautious when removing older, unused monographs, particularly those of interest to the humanities, which may use such resources in their research.[16] After briefly describing their own deselection project at LaGuardia Community College Library, McHale et al. conclude that although objective criteria for withdrawals are necessary for speed, librarians' professional judgment and even physically reviewing bookstacks will still benefit the final outcome.[17] Ward's

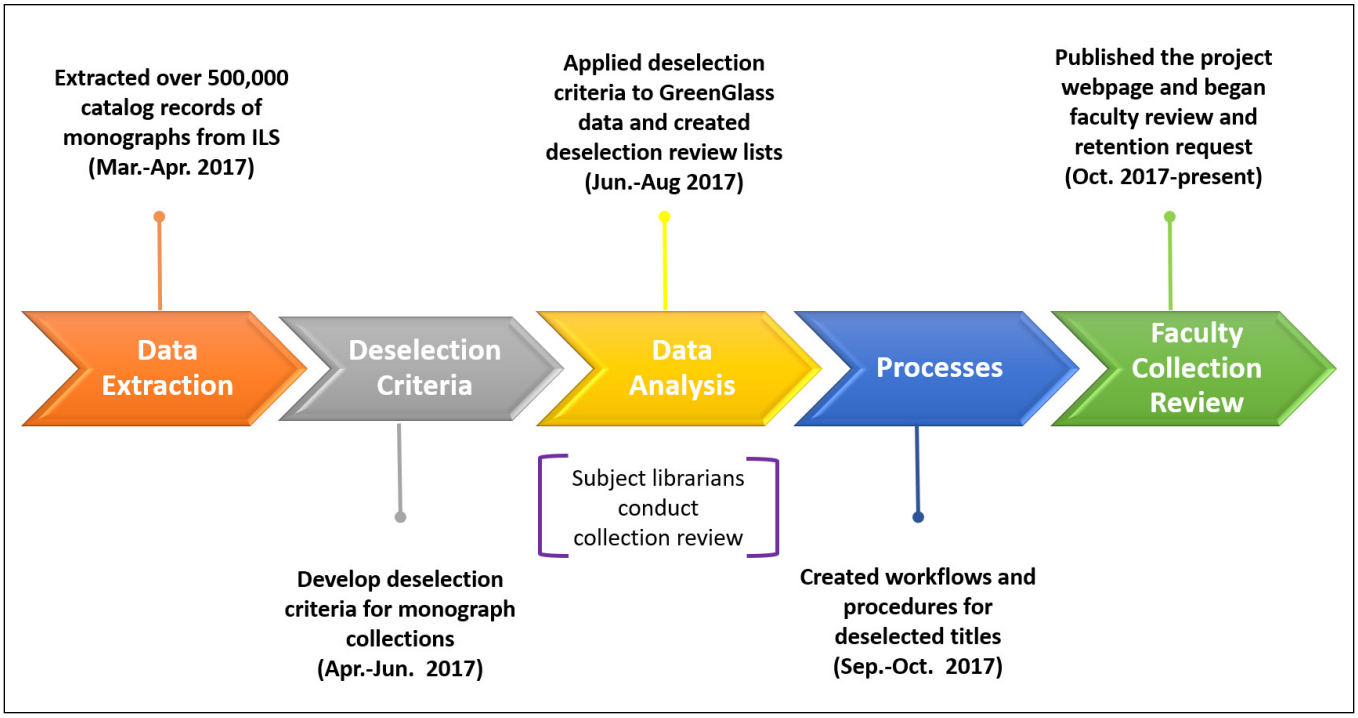

Figure 1. Collection Review Project Implementation Process

Rightsizing the Academic Library Collection examines the entire process for a collection review project, including the reasons to conduct a review, how to determine titles for deselection, and processes to remove and dispose of those titles.[18]

Methodology

Project Design

The Associate University Librarian (AUL) for Collections and Stewardship at the authors' library led the collection review project. She was responsible for designing the overall project, monitoring progress, and coordinating operations. In consultation with various library staff, the AUL identified three working groups at the initial phase: the GreenGlass Data Extraction Working Group (GDEWG), the Collection Review Working Group (CRWG), and the GreenGlass Data Analysis Working Group (GDAWG).

As illustrated in figure 1, the project began with extracting cataloging data from the integrated library system (ILS) for GreenGlass analysis in March 2017. The Library created three working groups and one implementation team to address various tasks and processes to advance the project. The first working group was the GDEWG (March–April 2017), which cooperated with SCS staff to provide the information required for extracting monographic bibliographic data from the local ILS and to identify the comparator list (e.g., consortium partners, ILL partners, peer institutions, etc.).

In the interim, the CRWG (April–June 2017) reviewed existing deselection guidelines and procedures, conducted a literature review of collection review practices, and proposed best practices for the Library's collection review. After receiving GreenGlass data from SCS, the Library created the GDAWG (June–August 2017). This group focused on identifying collection review criteria to apply uniformly across all disciplines, built upon CRWG's work. Deselecting librarians used the following baseline criteria:

- Books that were purchased prior to 2006;
- AND have not been circulated for more than ten years;
- AND are widely available at other libraries (forty+ holdings in the US, four+ holdings in the home state) and can be obtained through interlibrary loan if needed;
- OR are freely available as digital copies in public domain.

These criteria were considered as a starting point for all subject disciplines. Each subject librarian was instructed to apply additional discipline specific criteria if necessary.

Furthermore, the GDAWG proposed a communication plan with talking points for faculty and students regarding the collection assessment effort and processes for faculty involvement in collection review.[19]

Lastly, the Collection Review Implementation Team (CRIT) (September 2017–present) created procedures and workflows for the collection review, including the removal of deselected books from the stacks, maintenance of bibliographic records in the ILS, data management of faculty retention request forms, and disposal of deselected books. Since there were many changes with this project, the process of forming working groups and articulating deliverables was organic and sequential.

Faculty Collection Review and Outreach

The role of subject librarians as ambassadors to their respective departments was vital to the successful implementation of the collection review project. Subject librarians communicated the library's plan for deselection with their individual departments in a variety of ways, including, but not limited to, attending department meetings, speaking one-on-one with faculty and department heads, and via email. Various talking points developed by the GDAWG were useful for subject librarians' faculty outreach. Subject librarians endeavored to ensure that their departments understood how the process would work and responded to questions and concerns as they arose.

The GDAWG also proposed that the UL and subject librarians hold face-to-face meetings with faculty to introduce the project and to provide information regarding how books would be identified for deselection and what role faculty would play in the process. Following the initial introduction of the project, the group proposed that notifications be included in the university's daily email announcements. Furthermore, subject librarians continued to communicate with their departments regarding the overall process, notifying faculty monthly as new lists became available for review. Additionally, a website was created to provide information about the project including:

- links to review files with clear time stamps on start and end dates for faculty review;
- links to a form for faculty to request the retention of or the personal procurement of books identified for removal;
- contact information for faculty to share questions or concerns;
- frequently asked questions and answers.[20]

Meanwhile, the SCS-generated deselection lists were distributed among subject librarians, as determined by the LC call numbers relevant to their subject areas. Subject librarians reviewed the deselection lists and removed the titles they wanted to retain. This was the first qualitative review in the process that ensured that subject librarians applied additional criteria before the faculty review. There was no prescribed method for subject librarians' review. This was in part because all of the books in the GreenGlass deselection lists met the baseline criteria. It was also because each subject librarian knew best how to approach the review of books in their respective areas of subject expertise.

Project Implementation

As indicated in figure 1, the Library started posting review files for faculty on the project website, beginning in October 2017. New review files for faculty were posted on the first business day of each month. Faculty were given one month to review the deselected titles. They could request any titles for library retention, and faculty could claim titles for their personal collection if the Library did not retain them. CRIT designed the procedures and workflows to manage the monthly schedule of faculty review (see figure 2). The UL actively reached out to faculty and explained the project's scope and purpose, hosting town hall meetings for various campus communities. Individual subject librarians shared information about this project with their faculty on a regular basis.

When designing the project, the UL and AUL were extremely cautious about faculty perception. By nature, collection review projects are unpopular and could be an emotional process. Considering the magnitude of the project, the Library needed to ensure that the review process was thorough and thoughtful to gain faculty buy-in. Figure 3 summarizes the steps the Library took to generate deselection files for faculty review.

As mentioned above, the Library used GreenGlass to apply the baseline criteria (see step 1, figure 3). This first step quickly identified over 200,000 titles as possible candidates for deselection. Using the GreenGlass Query Builder, staff generated deselection lists by LCC. In this second step, subject librarians used subject-specific criteria, in addition to the baseline criteria, to further refine deselection lists prior to faculty review. After librarian review was complete, staff removed any other items that were not in the scope of this project or otherwise erroneously included, such as non-book monographs and special collections materials. This was the final step in figure 3 before faculty review started. The Library took extra steps to ensure that it was providing quality data for faculty review. The steps in figure 2 were repeated each month, beginning with the subject librarians' qualitative review to remove additional titles from deselection lists. These steps could be onerous, but the library was committed to building a process, driven by both

data and expertise, to guarantee exhaustive collection review.

Data Processing

The library created a web form for faculty to submit book retention requests. The form (see figure 4) asked for the faculty member's name, department, and on-campus address. The faculty could make retention requests by submitting a book's barcode number, title, and destination, which was either to keep the book in the Library or send it to faculty for their personal collection. There was no limit to how many books could be requested, but each book had to be added individually. This process resulted in thousands of retention requests for books from multiple faculty members. The data were analyzed on a monthly basis using a suite of Python scripts developed by one of the Library's software developers who was assigned as the project technology developer.[21]

If a book was requested by multiple faculty members, the Library applied the following criteria to resolve these conflicts:

1. A request to retain a book in the Library would overrule a personal collection request; and
2. The earliest personal collection request placed would receive the book.

At the end of each month, the project technology developer parsed all the previous month's requests into a list. The developer validated the data and corrected any invalid information. For example, faculty requests often provided a call number instead of a barcode, or listed the same barcode for two different books. The developer was able in every case to use the submitted information to correct the errors. Three monthly reports were then generated by the developer: a master list of books cleared for deselection, a list of books to be shipped to faculty for personal collection, and a list of books the faculty requested for retention in the Library. Additionally, several progress reports were generated to help analyze the project overall. These cumulative reports were organized by call number to easily associate them with the subject librarian overseeing that section of the collection. The project technology developer often created data visualizations to assist with the evaluation of progress. This paper does not include the detailed statistical analysis of the project because it is still ongoing at the point of submission.

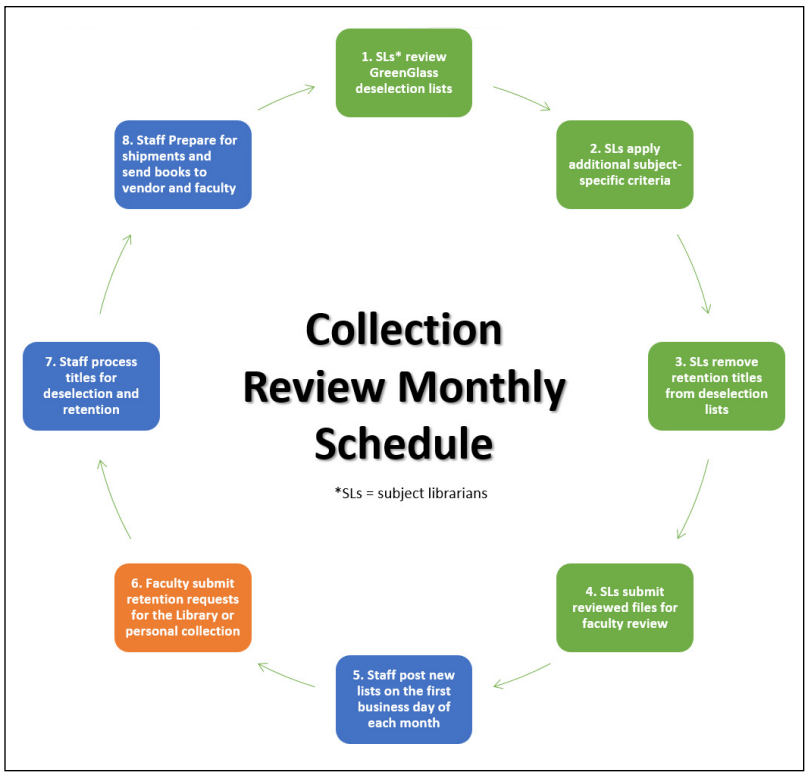

Figure 2. Monthly Schedule of Faculty Collection Review

Physical Processing

To process the final lists of withdrawals, both the Access Services and Description Departments hired and trained additional student employees and temporary staff. LC Easy, a program which drilled users for how books are arranged on shelves with LC call numbers, was used to teach LCC and the layout of the Library. Additional training included how to use the ILS cataloging module and OCLC Connexion.[22] They also learned a few relevant MARC fields, particularly those for the OCLC accession number, the ISBN, and the LCCN.

The student and temporary staff received the final lists of books selected for withdrawal. With a book cart in tow, they took the lists to the stacks and retrieved the deselected books. When removing a book, they compared the title, call number, and barcode number to that on the list to make sure the correct book was retrieved. Full carts were delivered to the Description Department for processing. The exceptions were those books requested by faculty for their personal collections; those were shelved and boxed separately. The staff suppressed a given book's item record, making sure the barcode number in the record matched that of the book in hand, and when necessary, also suppressed the holdings and bibliographic records. Suppressed

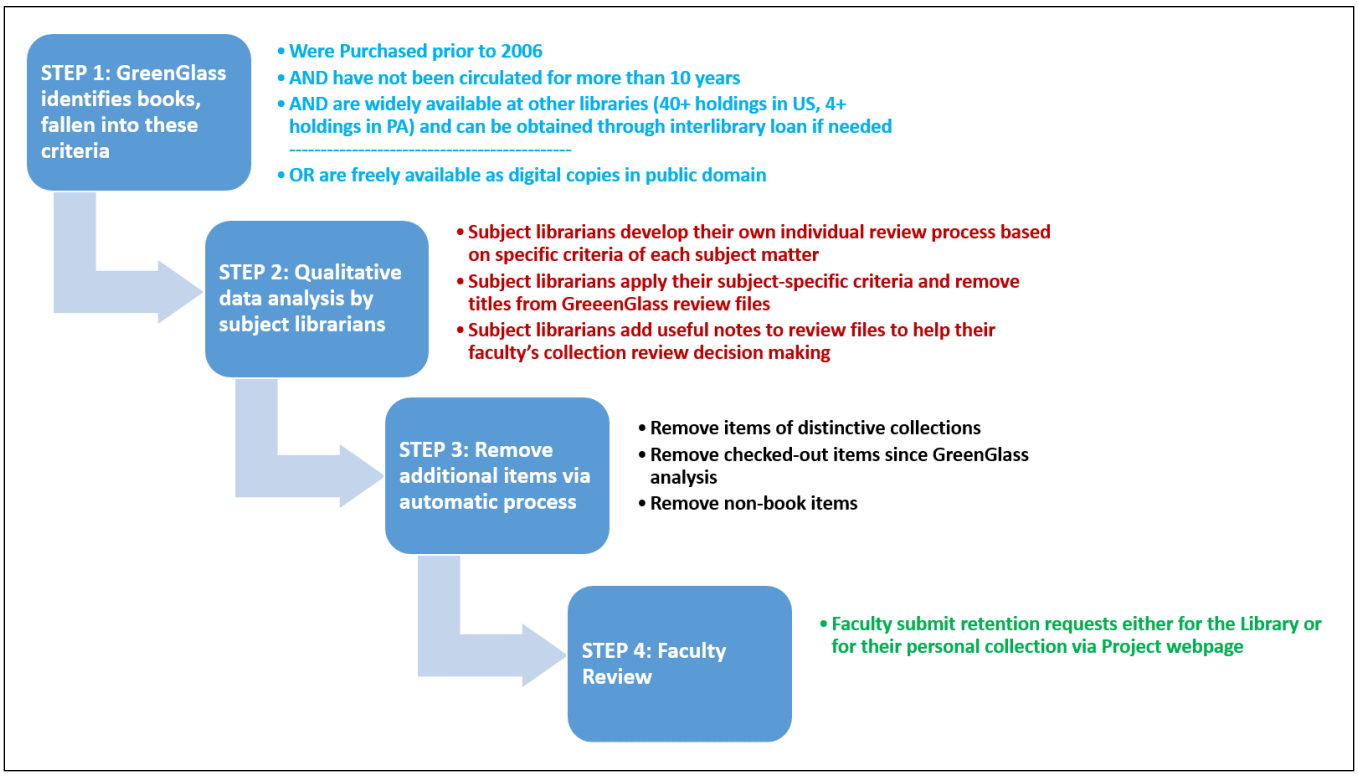

Figure 3. Steps of Creating Deselection Lists for Faculty Review

records received a note stating that they were withdrawn as part of this project for future reference. Using the OCLC accession number, the ISBN, or the LCCN, the student and temporary staff removed Villanova's holdings from the respective WorldCat record when the bibliographic record was suppressed in the library catalog. After catalog records were updated, staff crossed out labels and other library-related markings in the books. The books were shelved in a holding area and periodically boxed for shipment to the third-party vendor for repurposing.

Discussion

The extensive efforts and preparations that the library staff made prior to launching the collection review project, particularly the faculty review, were vital throughout the project. Because a collection review project can be challenging for both faculty and librarians, the successful completion of this project required meticulous groundwork for operations and effective communication strategies.

As anticipated, the release of the first batch of call numbers for deselection resulted in faculty from several departments contacting their subject librarians with concerns regarding the lists. Concerns came primarily from the humanities and social sciences, while STEM and business expressed less concern. This is not surprising, not only because hard sciences typically rely more on journals and databases and less on books than the humanities and social sciences, but also because their fields of study are much more focused on current research. Thus, they had less reason to be concerned about the deselection of older titles, which in their areas, become outdated quickly. The criticism the Library received after releasing the first batch focused on three primary areas of concern:

1. The fact that deselection was taking place;
2. The time allotted to review lists was not sufficient; and
3. The Faculty Retention Request Form was too tedious and/or difficult to fill out.

Concerns about the project overall were handled in a number of ways by different subject librarians, but the initial approach was to reiterate the criteria for deselection and to remind faculty of the librarian review process. In many cases, reminding faculty of these two steps was adequate. In some cases, this approach was insufficient, and subject librarians scheduled meetings with department chairs to discuss ways that they might adjust reviewing the lists. In other cases, the UL and AUL were asked to participate in meetings with faculty and their respective subject librarians.

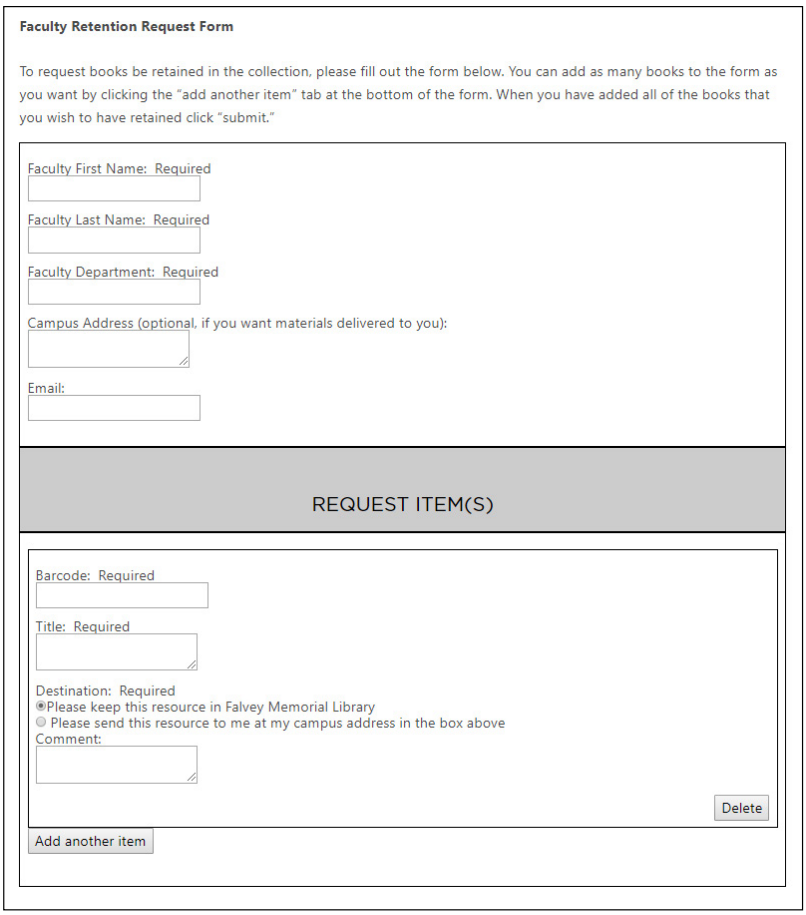

Figure 4. Faculty Retention Request Form

The number of books posted for faculty review each month varied, and ranged from a few hundred to a few thousand, depending on circumstance. For example, during busy academic periods such as the beginning of a semester or during final exams, less books were posted in consideration of the faculty's workload. Generally, when faculty expressed that they did not have enough time to review a relevant list in a month, additional time was granted. This was an effective way to improve relations with faculty. Only 18 percent of the books that faculty retained were requested during an extension. Furthermore, faculty reacted very positively to receiving the extra time to review. Although extensions did not significantly increase the number of books that faculty requested for retention, they served to make the faculty feel more comfortable and flexible with the process.

One aspect that staff were cautious about during the project design phase was how faculty would make retention requests. The interface design for the form was greatly influenced by CSUF's collection review experience with faculty.[23] The Library's process was designed to honor all faculty requests, but project staff wanted to design a retention request form that would not make it too easy for faculty to select a vast number of books for retention. However, the form that was developed may have been overly burdensome. It required a lot of manual data input (see figure 4). As a result, some departments decided to hire students to enter required data on behalf of faculty. In retrospect, it would have been better to design an autocomplete system that used a book's barcode to reduce errors and balance the burdens placed on the faculty and their student employees.

During the faculty review, the project technology developer made several adjustments to the original data processing routine. For example, one project member was tasked with emailing faculty to inform them of which books they should expect to receive for their personal collections. It became apparent that gathering the information for these emails and sending them individually was repetitive and tedious. To address this, the project technology developer added an additional report to the monthly reports that automatically formulates the email from a template based on the data.

Another issue with the original data processing was that project staff had not considered that books could be checked out after the Library sent circulation data to SCS. Because this violated the baseline criterion "books have not circulated for more than 10 years," some faculty brought this to the Library's attention after the initial lists were published to the faculty. The project technology developer created a monthly routine to remove these books from the faculty review files.

Addressing specific data requests became difficult because of the rigid nature of the data storage—plain text files and spreadsheets. The project technology developer developed a new Python script to retrieve data for questions such as "how many requests for retention a given faculty member has made" or "can all titles from a specific publisher be excluded?" To make these questions easier to answer, the project technology developer created a relational database to store all relevant data. Most requests and reports could be generated with SQL queries and exported as spreadsheets. Initially, only the project technology developer could access the back-end data. After developing the relational database, project staff could access the database and generate their own reports, manipulating the data as needed.

An unexpected development arose when preparing shipments of deselected books to send to the third-party

vendor. The holding area filled to capacity considerably faster than anticipated, necessitating students to box books for shipments rather than process withdrawals in the library catalog. Packing the boxes took longer than anticipated. This meant that preparing shipments took a significant amount of time that had been originally allotted to withdrawing books. In response, the Library scheduled more hours for students to work in subsequent semesters.

Managing student employees also posed challenges. Some students were extremely reliable and performed their assignments superbly. Others were less reliable, and that slowed processing at times. Furthermore, because the library building space is well-utilized for diverse academic learning units and services, space for staff and processing is extremely limited, and student employees were located in a room distant from their supervisor, creating communication challenges. The number of books withdrawn dropped considerably during University break periods as student employees left campus, especially around holidays and in the summer. More hours for students to work were scheduled, but filling those hours also proved problematic. In response, the Library hired several part-time temporary employees to perform more of the computer processing. Currently, student employees focus on pulling deselected titles from stacks and boxing shipments, which increases physical processing considerably.

Conclusion

This paper presents the comprehensive collection review project, concentrating on project planning and processing at Villanova University's Falvey Memorial Library. This project marked a significant milestone in the Library's history. It was the first comprehensive collection review project that involved all subject areas and all library departments. Throughout this multi-year project, library staff displayed high-level collaboration and teamwork, aiming to achieve a shared goal. Second, although the project experienced a degree of faculty resistance and dissatisfaction, faculty inclusion in collection review was generally positive and meaningful. Often, the project strengthened librarian-faculty relationships. Third, the Library's collection has relevant content that aligns well with the University's academic concentration and resulted in providing more physical space in which the collection can grow. As Villanova University focuses on research growth, diverse scholarly resources are crucial to support actively evolving campus academic research activities. After launching the project, the Library placed a great emphasis on acquiring print monographs and e-book packages that support the current academic programs on campus, and the collection budgets were adjusted accordingly. Every subject monograph fund has been increased annually to fill gaps in the book collections, both print and electronic. Lastly, the Library's monographic holdings data have been updated through complete inventory control during the project. Staff identified numerous missing books from the stacks and updated the library catalog.

When this project has been completed, Falvey Memorial Library will celebrate its long and winding journey of collection review and start planning to develop a routine for collection review for the future. Library staff will feel a sense of accomplishment and cherish the collegiality and teamwork that helped to overcome various challenges and difficulties throughout the project. Most of all, the Library successfully laid the groundwork for building a healthy monograph collection for future collection growth.

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Notes on Operations

A Controlled Vocabulary for an Electronic Resources Problem Reporting System

Creation, Implementation and Assessment

Anita K. Foster

The Ohio State University Libraries' Serials and Electronic Resources team tracked reports of problems with electronic resources through a ticketing system, but had not used the system functions to articulate the work involved in supporting such resources. When a new Electronic Resources Officer was hired, the librarian reviewed the type of statistics provided to management and identified an opportunity to more fully document reported problem and staff effort. With the help of team members, a mechanism was created to highlight different types of problems through the application of a controlled vocabulary developed specifically for that environment. Once the vocabulary was available and in use, after some time, terms were evaluated for efficacy, and for how the use of the vocabulary enabled analysis of the trouble-shooting process. Following an analysis by the Electronic Resources Officer of the terms after being in use for some time, the ways that staff were involved in the workflow was changed, leading to faster responses and more consistent communication of information to patrons and vendors. This paper describes the process of developing the controlled vocabulary, the insights found following implementation, and the changes to the workflow that came from that analysis.

In an ideal world, access to electronic resources (e-resources) would be straightforward and stable, as is often the case for print materials. Unfortunately, access to e-resources can fluctuate or behave unexpectedly depending on the path a user takes to get to a site. There are many factors that impact the availability of a resource and can include the following—was the subscription paid on time, were there publisher or platform changes, or were there changes on campus such as network updates that might impact off-campus authentication? The management of e-resources is a continual process, where vigilance is necessary to keep access available to end users. When libraries managed fewer e-resources, it was possible to monitor their performance, but as libraries invested more of their budgets to them and as portfolios of products grew, it quickly became difficult for most libraries, regardless of size, to monitor access regularly. Libraries had to consider where effort was best used—be proactive and dedicate staff time to checking platforms regularly, as described in Mortimer's paper describing an e-resources auditing program, or be reactive and determine the problem once it has been identified.[1] While many libraries may try to do both, focusing on the resources that regularly have problems in a proactive way and concentrating on others only when a problem is reported, the author's experience is that realistically most staff effort is expended on being reactive, addressing problems when they are identified. The issue with being reactive, however, is that it can be difficult to identify when there is a larger

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problem occurring and through solving it, the number of individual reports will be reduced.

Librarians use many methods to manage the reporting of problems with e-resources. Email is often used, but trouble ticket systems are also common. Trouble ticket systems provide ways to track the status of problems, reduce the amount of email communication, and trouble ticket work is often shared by a team. Additionally, trouble ticket systems have reporting features that can be used to describe the effort of the staff fixing problems. Features may include average time to completion, who managed specific tickets, completion statistics, all of which detail the work involved in supporting e-resources. Some systems also have opportunities to tag tickets for type of problem.

At The Ohio State University Libraries, the Serials and Electronic Resources (SER) team, a seven person teaming consisting of five staff and two faculty librarians, uses a ticketing system to report e-resource problems, whether they involve journals, books, or databases, and to resolve any type of problem, including access, cataloging (e.g., missing or inaccurate records), or holdings coverage. Since 2013, the team has used Atlassian's JIRA Project Management software to manage trouble tickets. When first implemented, few features available within JIRA were used in the trouble-shooting workflow, and the previous team manager, an electronic resources librarian, used basic reporting functions to report trouble ticket activity. The number of tickets received in any quarter was reported, as was the amount of time it took to resolve tickets, and quantity of tickets closed. The reports did not include information about the types of problems solved or when there were interactions with other University Libraries' units. Recognizing that much of team's effort was invisible beyond those partners, shortly after beginning employment in 2016, the new Electronic Resources Officer investigated additional opportunities to use information collected in JIRA to illuminate the effort to support access to e-resources, and to also identify areas where proactive work might happen and ultimately reduce barriers to resources for the university community. A controlled vocabulary consisting of types of problems would be an asset for learning those trends but one did not exist within JIRA, so the Electronic Resources Officer determined that one would need to be created. This paper details that process, and the unanticipated outcome that led to changing the significant parts of the e-resources problem solving workflow.

Literature Review

Troubleshooting e-resources is complex. According to NASIG's document, "Core Competencies for Electronic Resources Librarians," an important personal quality for an Electronic Resources Librarian is a tolerance for high levels of ambiguity as this is quite useful when troubleshooting e-resources.[2] Being successful at troubleshooting requires experience working with e-resources, both when resources are functioning properly and when something goes wrong. Resnick, in an article on identifying core competencies in e-resources access services, discusses the need for a thorough understanding of how to resolve problems.[3] Training methods for the development of e-resources troubleshooting skills and processes has been reported in multiple papers, such as those by Carter and Traill, and Rathmel et al.[4]

Having the skills to successfully trouble-shoot problems with e-resources is only part of the picture. Being able to describe problems reported helps in several ways, possibly most important is the impact on end users and being able to facilitate their success in finding and using resources. Having a place to receive and store information about problems can help document problems and solutions. Many libraries use ticketing systems to track a variety of factors involved with managing e-resources problems. In 2014, Samples reported that 43 percent of the respondents to the eProblem Reporting Questionnaire indicated that they used a ticketing system.[5] Few e-resource management systems (ERMS) include a ticketing system, leading librarians to rely on other products, often borrowed from Information Technology help desks, to track problem reports. Smith provided an overview of things to consider when thinking about implementing an e-resources ticketing system and how their library used Springshare's LibAnswers for this purpose.[6] Erb discusses using LibGuides, also from Springshare, to assist with troubleshooting.[7] Christman describes another experience with setting up a ticketing system when his organization transitioned from receiving reports via email to the open source product Spiceworks.[8]

Although there are examples in the literature about trouble-shooting and using ticketing systems to manage reports, there is less written about the "next steps" of using ticketing systems. Wright discusses revising workflows following the development and utilization of a ticketing system at the University of Michigan.[9] Another example of a next step is using a controlled vocabulary within a ticketing system to identify types of problems received, and using the vocabulary to make process changes for trouble-shooting. Goldfinger and Hemhauser described the process used at the University of Maryland, College Park to code trouble tickets to develop a vocabulary that was then used to provide data to aid in answering four questions: who reported problems, how well staff solved problems, to identify the most frequent types of problems, and to determine whether problems could be prevented through proactive work.[10] The authors also described an opportunity to create canned responses to common problems to provide more consistency in answers, and if functionality in their ticketing system that

could be used to better advantage. Brett at the University of Houston replicated the process and vocabulary described by Goldfinger and Hemhauser to explore whether the same vocabulary could be used at different institutions.[11] Brett concluded that the vocabulary could be transferable.

Very little information was found in the literature about using trouble-shooting trends identified using controlled vocabularies to realign staff effort. This paper fills a gap in the literature about reassessing the trouble-shooting process and staffing using quantitative information gleaned from assigning controlled vocabulary terms to trouble tickets.

Environment

The Serials and Electronic Resources (SER) group, a unit within the Electronic Resources Management Team (ERMT) at The Ohio State University Libraries, manages all aspects of the e-resources lifecycle, from acquisition to licensing to description and managing access and is led by the Electronic Resources Officer. A core activity in which all staff in the unit are involved to varying degrees is e-resources trouble-shooting. Trouble-shooting at the University Libraries is a two-fold process. Most patron questions are first received by the Reference Desk, whose staff does initial triage and basic trouble-shooting. Reference Desk staff reports that many questions are site navigation related (where to find the link to download an articles) or "how to" focused (how to access resources from off-campus, how to search a specific database). Questions come from a variety of sources, including Find It!, the University Libraries' link resolver (Serials Solutions 360 Link) Report a Problem feature, Springshare's LibAnswers (chat and email) and in-person interactions. If the staff is unable to determine the problem or needs to communicate information about catalog records or configuration of resources, they open a ticket via a reporting system; tickets are received by SER staff. Another partner in the trouble-shooting workflow is the ILL unit, who regularly identify serials holdings inaccuracies and difficulties finding content on journal and book sites. Library staff and patrons can also submit problem reports directly to the team through an online form or via email.

SER and others in the University Libraries use Atlassian's JIRA system to manage tickets for multiple uses (e.g., IT support, facilities issues). Tickets are submitted to the Electronic Resources Problem Alert (ERPA) form, and the information is available to all SER staff assigned to the project. The original process assigned staff to specific days when they were expected to be the lead person to handle any submitted tickets. Staff can escalate tickets among the group or transfer tickets to the University Libraries IT group when appropriate. Escalation within the group could mean assigning a ticket to the staff person who works with a specific vendor for order or subscription clarification; more complex problems where the cause is not readily apparent are assigned to the electronic resources access coordinator for completion. Using JIRA for e-resources problem reporting has been in place since 2013. Using JIRA has made analysis of reports possible. Previously, prior to the project described in this paper, statistics were collected by the Electronic Resources Librarian managing the team from submitted tickets to track information such as number of tickets opened in a month, time to resolution grouped by number of days, and median time for resolution. While this information tells some of the story about the effort expended by the unit for troubleshooting purposes, it is incomplete. Information about the type of reports received and the average time spent on each type of problem was not captured. Additional information provides a deeper picture of trouble-shooting activity managed in the SER unit and has the potential to identify regularly occurring problems that may be prevented by being proactive. Additionally, this information could possibly impact staffing for the unit, both in terms of numbers but also staff members' core responsibilities. Ultimately, by including more information about staff effort, the unit manager could more fully detail the work handled by the unit to the program and division administrators.

Project Goals

There were two goals for this project: (1) to provide additional statistics on problem resolution work done in the unit that could be reported to division administrators to more accurately document SER's effort in greater detail, and (2) to identify areas with more frequent trouble reports and to determine how to proactively reduce or eliminate occurrences. The goals could be accomplished through reworking and adding to the types of statistics gathered for the unit's problem-solving activities. When investigating options available for creating statistics with information gathered in JIRA, a knowledge gap was identified. Time for resolution (averages and means), numbers of reports per month and who handled how many tickets were easy to gather, and the first two were regularly reported. However, the types of problems managed and any variations in the time needed for those different types of problems could not be captured automatically by the configurations used at that time for ticket records. The team did not use JIRA's Label tagging feature, and through discussions of possibilities, the team identified it as a potential way to better identify the types of problem reports received by the unit. However, the Label feature lacked a vocabulary, and was populated solely through free text entry. Leaving the tags up to individual team members could lead to inconsistency of use and the

types of terms used. The solution was to develop a standard vocabulary, where everyone in SER agreed to the definition of terms.

The Electronic Resources Officer developed simple and clear criteria to guide the creation of a controlled vocabulary for the ERPA tickets:

- Terms should be easy to remember, but clearly reflect the reported problem
- Terms should be short (not more than two words)
  - Shorter words theoretically would be easier to remember and reduce time spent looking them up
- Total number of terms in the vocabulary would be less than 15, with 10 being an ideal target
  - Fewer terms, but targeted, would also reduce look ups

With those ground rules in place, the next step was to develop the list of terms. Recognizing that a good starting place is with existing content, the Electronic Resources Officer analyzed problem tickets to determine a foundation for the vocabulary to use in JIRA's Label field.

Method

The first stage in the vocabulary development plan involved analyzing existing JIRA ERPA tickets to glean potential vocabulary terms. There are common, frequently-reported issues about e-resources—such as broken URLs, holdings information conflicts, and off-campus access problems. Once an initial set of terms was identified, the entire SER unit would provide feedback and assisted in refining terms to produce a workable list.

JIRA does not purge tickets upon resolution and the full history of reports since JIRA implementation was available for review. When the project started, there were 1,771 tickets available for analysis by the Electronic Resources Officer. While evaluating all tickets before doing an analysis was considered, and a small set (thirty-seven) was evaluated in this way, the time involved to look at all tickets precluded quick development of a vocabulary. Instead, a randomly selected set of 200 tickets for a specific time period was chosen. The time period chosen for analysis was January 2015 to early September 2016; a determination was made that this was a sufficiently long period of time to reveal commonly reported problems and the SER staff primarily involved in trouble-shooting had been stable during that time. The final set of tickets used for analysis was 237.

The tickets were each evaluated on their own merit and in isolation, with no initial consideration of others in the set. This was done in part to mimic how individual team members might process tickets, but also so that previous and subsequent ticket's information would not influence term assignment of any single ticket. Although a single person did this analysis, and therefore was subjective, the ground rules for the vocabulary were rigorously followed and the researcher's experience with creating other controlled vocabularies reduced subjectivity. The core problem as reported was examined and assigned a term that best fit the type of problem as a whole, not the initial report nor the outcome., Often, a term or phrase within the report was the core issue; for example, tickets related to access problems tended to use the word "access" and tickets for link problems tended to use the terminology "bad link" or "broken link." This existing availability of language from the reports helped lead to the preliminary set of terms for this vocabulary. Other tickets' information took more time to determine a single term or phrase to assign, either due to complexity of the issue or extended comments added as the problem was being resolved; looking at the entire ticket from reporting to resolution was necessary to determine possible terms. The process of identifying terms in more complex reports was informative and proved useful when discussing the potential list with the problem reporting team, especially when discussing term definitions.

Once the sample set was evaluated, the terms assigned to each ticket were examined. A count of the terms was done, and evaluated. There were thirty-five terms in the first pass. Terms with a single instance were reviewed, and if similar terms existed, a term was chosen that best fit the problem, and all other tickets were reassigned this preferred term. This led to "broken link" becoming "bad link" and "update catalog record" and "modify catalog record" becoming "catalog record." The original analysis resulted in twenty-three terms, detailed in table 1.

Where many records with similar terms were narrowed down to one with a common meaning, a few terms with a single report were retained for additional review and feedback from the team. This allowed the problem-reporting team an opportunity to determine if some problem instances were impactful enough, or, if due to the potential time needed to resolve, that the single ticket term should be retained and counted. By keeping the single ticket terms in the list for review, there was also some control for possible impacts of the random set selection may have had, as the issue could more frequently occur than the sample set indicated.

Once the Electronic Resources Officer created the initial list, it was presented to the problem reporting team for review, reaction and revision. The review revealed that the single incident terms did not happen particularly frequently, and they could fall into the "misc_error" category. The final list of terms, numbering thirteen, is provided in table 2.

Table 1. Original term list

Type of Problem	Count
access	60
staff maintenance	37
bad link	36
catalog record	25
content	24
coverage	7
outage report	6
proxy	6
site behavior	5
expired subscription	4
holdings	4
link resolver	4
database list	3
misc error	3
incorrect holdings	2
journal recommendation	2
scheduled maintenance	2
searching	2
branding	1
browser	1
certificate error message	1
order question	1
WorldShare	1

The team recognized that terms might mean different things to members. Definitions were solicited for the terms after the initial list was created. Definitions were not initially included with the list for a few reasons—to get initial reactions to the terms and to reduce any potential influence existing terms might have on developing the term list or potential slowdown in developing the list if the team became bogged down with the definitions. Definitions were added to the list to facilitate a common understanding for the usage of the terms; the SER team identified that as a core factor for success for using the terms. Specific examples were included only for the terms for which clarification in meaning beyond just a definition was requested by a team member, such as the difference between problem reports for bibliographic records and inaccurate holdings information, or when is a link broken versus when is content missing. Additionally, team members believed that examples would help to differentiate similar sounding terms such as link issue and link resolver. Recognizing that sometimes an issue can be something other than originally determined, the team agreed that when the category of a problem was unclear, "Access" could be assigned. When the true nature of an issue was determined, a more accurate label would be assigned. Of course, access problems can be just that, so "Access" could still be used when it best described a problem.

The team began using the list in March 2017 with JIRA's Labels feature, and members were encouraged to label any tickets assigned to them earlier in the year to facilitate a complete year of information. This would then enable more meaningful analysis when presented outside the unit. When the first set of statistics was compiled in July 2017 after the SER team began using the controlled vocabulary, the person who gathered statistics assigned a label to any tickets lacking one. This first set of statistics was reviewed for compliance of the team to use the terms as well as any initial discrepancies in term use. The first collection period results are seen in figure 1.

Results

During the initial year of use, there were no changes made to the list of labels. As staff familiarized themselves with the terms, there were additional discussions to refine the definitions and to clarify for what specific situations a label would be used. No situations were identified that required the addition of new terms to the list during the first year.

Once a vocabulary is established, it takes time for usage patterns to be established. That was true for this problem reporting vocabulary. Once the labels were decided and definitions determined, the process was left to age for approximately a year. In figure 2, the most frequently assigned labels during that time are identified.

As seen in figure 2, the most frequently assigned labels were "Access," "link_issue," and "link_resolver." While it was not surprising that these were commonly assigned terms, "Access" was unexpectedly high. The scale of reports with this assignment indicated two things: a possibility that team members did not revisit labels after the initial assignment as agreed, or that the definition for "Access" was so vague that team members felt more comfortable using it than other more appropriate terms. Both possibilities indicated a need to review/revise the labels and how team members would determine which label to use, each of which was a training opportunity. An analysis of how the term "Access" was assigned was conducted to identify how it was being used and what training might be needed. The first analysis examined accuracy of the assignment, for which there are four possible states—original and resolved assignment matches the reported problem, original and resolved assignment do not match, original assignment does not match but resolved does or original assignment matches but resolution does not. Of the 243 problem reports assigned the "Access"

Table 2. Final Term List

Code	Definition	Examples
access	problem accessing site or full text due to an undetermined reason	
catalog record	concern about information in the catalog record	URL is missing or incorrect; request to add or remove fields, locations or data from the catalog record
content	content is missing or unusable	having some but not all issues of a volume, pdf is illegible when opened; eBook is missing pages or chapters
coverage/holdings	inaccurate or incomplete holdings information in Find It or the catalog	
database list	resource is missing from the research database list or there is a request to add or remove subjects from a resource record	
expired subscription	message seen at a resource that a subscription has expired (determining whether the subscription has truly expired before assigning this label is not necessary)	
link issue	link goes to an incorrect place, is broken or does not retrieve appropriate full text	
link resolver	journal is not listed in Find It or the A to Z list or additional sources are discovered for a journal	
misc error	any error that does not fit with any other label	certificate errors, journal suggestions, questions about orders
outage report	report of an outage of a site, either scheduled notice or outage identified by user	
proxy	problems accessing resource from off-campus or access problem where solution was to update proxy information	
site behavior	suboptimal performance for a site or unexpected actions at a resource	sluggish or slow actions, unexpected messages following actions

label, the analysis determined it was just as likely to be incorrectly assigned as correct.

Further analysis of the reports where the original assignment and the resolved assignment did not match led to additional conclusions. The team had not recently discussed the labeling activity beyond reminders to tag the problems on which they were working, and it was clear that a refresher of the process was needed, particularly revisiting tickets and reassigning labels as appropriate when the problem had been resolved. The proportion of reports that ideally would have been labelled "misc_error" highlighted a need to potentially add a new label to the set. A majority of the misaligned labels involved IP addresses, which was a problem in Summer-Winter 2018, when the campus began using the IPv6 formatted addresses in buildings and the wireless network, which many vendors and publishers could not support. The Electronic Resources team often learned about the campus changes only through the receipt of a problem report that initially appeared to be an access problem., Once investigated, it was clearly a proxy related problem. Other common misalignments included issues with links, site behavior and content. Figure 3 details the misaligned labels.

Workflow Changes

The review of the use of labels highlighted issues with the overall problem reporting process. The labels used were an accurate reflection of the type of problems received by the team and the work done to resolve them. However, evaluating the problem tickets also illuminated a known aspect of the process that had not been directly addressed, which was a general inconsistency of customer service when responding to problems. The review of the tickets assigned the "Access" label brought this to light. Since a team handled the problem ticket resolution, some inconsistency was unavoidable. However, the range of answers to common problems and response times was a concern. The team often discussed how to resolve tickets in regular standing meetings. Although all members could review any ticket, they expressed feeling uncomfortable addressing more complex problems or those that did not clearly fit into their position responsibilities. How much time team members spent on resolving tickets varied widely; for example, if a vendor needed to be contacted to resolve a problem, some team members checked regularly for an answer while others only checked for messages on their assigned days. While the

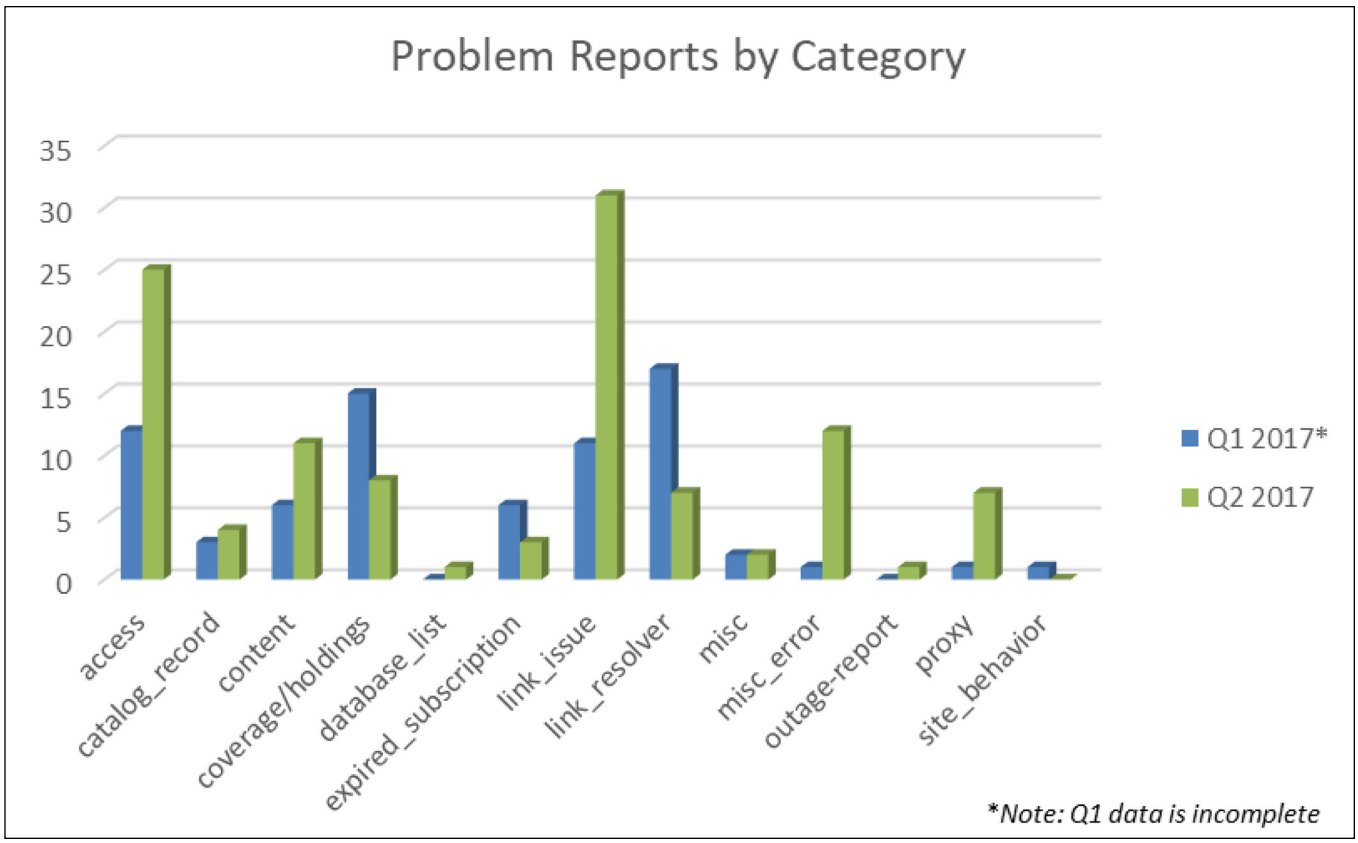

Figure 1. Initial Reporting Period

label analysis was underway, the team lost members when two staff accepted other positions, one of which was the Electronic Resources Access Coordinator. This proved to be an opportunity to make significant changes to the entire trouble-shooting process.

Following the hire of a new Electronic Resources Access Coordinator, a closer look of the entire problem resolution process was conducted during the Coordinator's onboarding. After receiving training on how to identify an issue with a resource through trouble-shooting and strategies on how to approach solving them (e.g., escalate to another team member, contact vendor), the new Electronic Resources Access Coordinator was encouraged to respond to any submitted ERPAs for which they felt ready. As the Access Coordinator became more adept with resolving problems and with the JIRA system, they expressed a desire to assume greater responsibility for the problem reports, and not just the complex ones, which supported the need to make changes.

The changes that were made flipped the previous model. Instead of the Access Coordinator being the person who managed the more complex problems that others in the team could not resolve, typically due to the complexity of the issue, the Coordinator became the first person to evaluate any submitted problem reports. The Access Coordinator involved other members of the team as necessary. For example, if there was a question about a subscription or volumes held, the ticket would be transferred to an ordering specialist or to a cataloger, depending on the specific problem. Making this change quickly produced several benefits. First, it provided a more consistent voice for responding to problems, both towards the people reporting the problem but also with the library IT department and vendors. Additionally, there was a reported confidence in the process by staff outside the unit since that they knew who was managing the trouble-shooting process as a whole and that the tickets would be resolved quickly. This was particularly the case with strong partners such as ILL and the Reference Desk. Second, problem reports are now monitored more closely. With the previous model, team members tended to be passive, and checked JIRA only on their assigned days, or when an email was received from another person (vendor, etc.) helping with the resolution. More frequent attention is paid to resolving the problems when one individual is managing them and therefore are more quickly resolved.

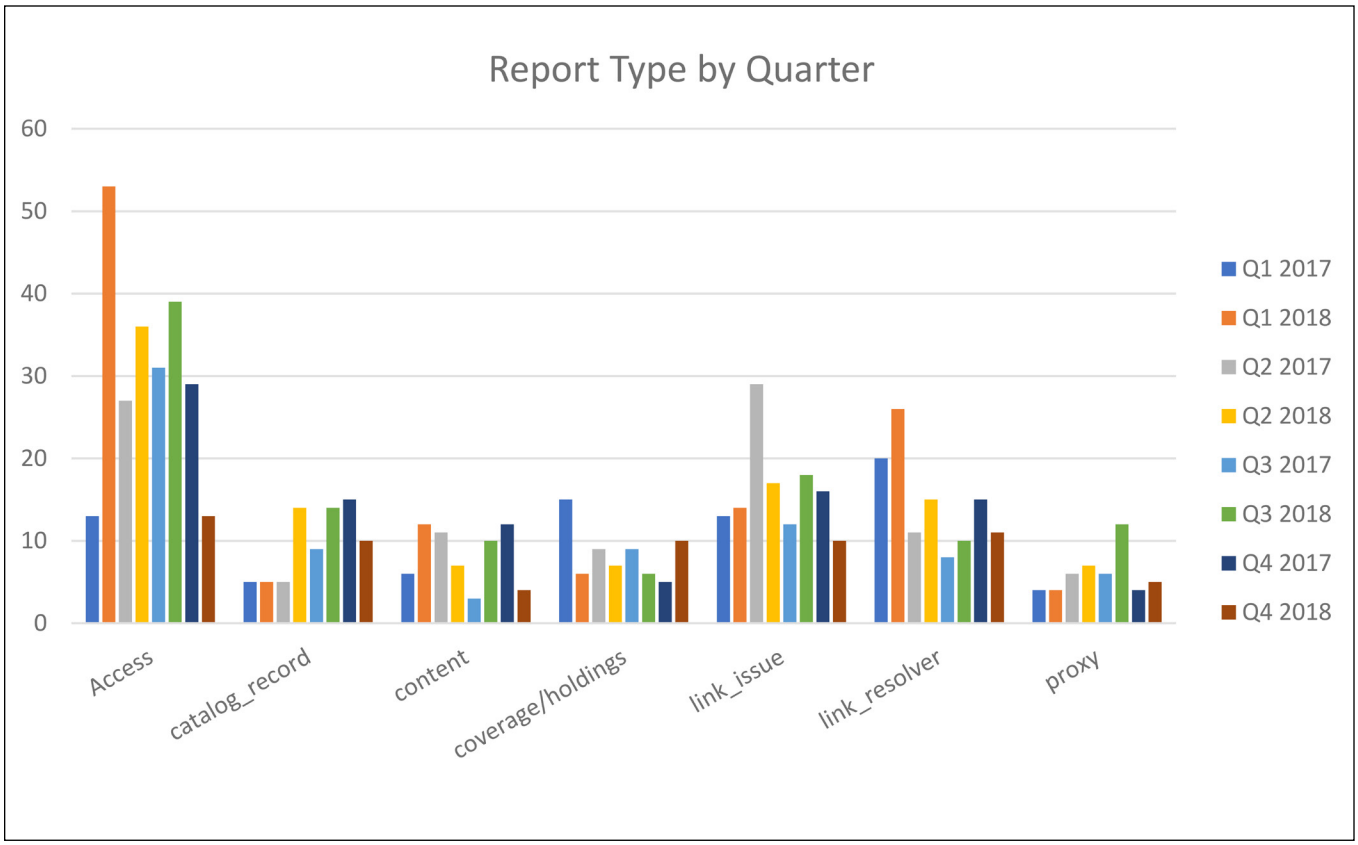

Figure 2. Labels assigned over 2 years

This ultimately leads to better end user experiences, for the initial reporter and any users of a resource, which is a high priority for the unit. Finally, the consistency of label assignments has improved, which means a more accurate picture of the type and complexity of the work can be provided. Staff who no longer were responsible for regular monitoring of tickets but still involved in the process reported greater confidence in their ability to answer questions, as they knew any questions they received better matched their areas of expertise.

Table 3. Accuracy of access label assignment

Access Label Assignment Accuracy	Original Assignment Matches	Resolved Assignment Matches
no/no	101	101
yes/yes	102	102
no/yes	1	1
yes/no	39	39

Conclusion

Using a ticketing system to track the resolution of e-resources problems ensures timely processing of reports and rapid return of access. Basic data about problem reports can describe part of the effort for maintaining e-resources in terms of the time it typically takes to manage a report. This data can be made more granular and therefore more useful by identifying the types of problems received, how they are managed, and where more staff effort is spent. Ticketing systems generally lack options for tracking types of problems and few are specific to the types of problems seen in managing e-resources, so libraries either lose an opportunity that the information could have supported or need to create their own. By creating a local controlled vocabulary for tracking e-resources problems, it is possible to clearly report and reflect on issues managed by e-resources staff. Using the data from the vocabulary, a unit can identify pertinent data points, which can lead to refining processes and providing better end user experiences. While the vocabulary developed at The Ohio State University Libraries is short, it captures information that is useful in evaluating staff engagement and in enhancing workflow processes, leading to an overall improvement in service.

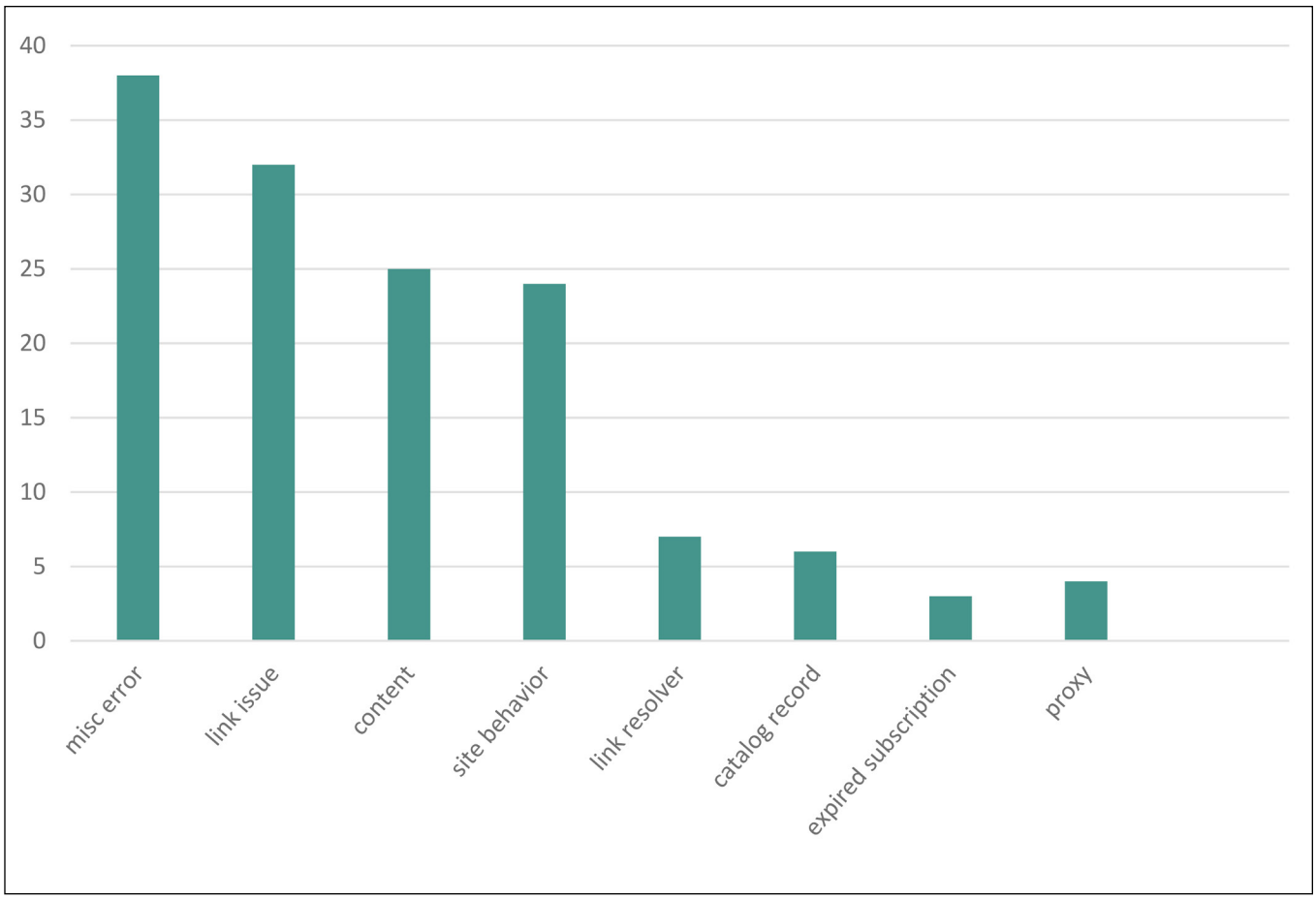

Figure 3. Appropriate Labels for Reports Originally Tagged Access

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