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Across Three Research Institutions

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Where do our Problems Lie?: Comparing Rates of E-Access Problems Across Three Research Institutions

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Abstract

In order to build upon the research of Brett (2018), the author categorized over three hundred e-resources troubleshooting tickets at The University of Alabama Libraries into a coding scheme originally created by Goldfinger and Hemhauser (2016) with the goal of cross-comparing the results with that of two other research libraries. The results of the analysis shed light upon the most commonly reported types of problems among the three institutions, and patterns emerged that could be indicative of industry-wide concerns. The author also developed a more specific, local classification schema in order to identify areas in which local solutions could be implemented to improve user experience.

Keywords: troubleshooting, knowledgebase, metadata, electronic resources, e-collection management

Introduction

Electronic resources require maintenance and troubleshooting over time to retain the ease of access for users. Librarians often work with hundreds of vendors, platforms, and tools to keep electronic resources accessible; however, the many touch points throughout the e-resource lifecycle bring about many potential points of failure. Though e-collection managers often implement proactive approaches to ensure that problems are minimized for library users, access problems can and do still occur. A number of studies within the last ten years have sought to understand the nature of and patterns within reported e-access problems at libraries, aiming to discover ways in which improvements can be made to local workflows in order to minimize future problems and improve user experience (Browning, 2015; Goldfinger & Hemhauser, 2016; Kimbrough, 2018; Mann & Sutton, 2015; Resnick & Clark, 2009; Wright, 2016). However, only one such study has taken on the task of creating a cross-comparison of e-access problems between institutions (Brett, 2018). Brett (2018) compared e-resource troubleshooting tickets at the University of Houston with that of the University of Maryland, College Park using a controlled vocabulary (called “Functional Areas”) created by Goldfinger and Hemhauser (2016) with the ultimate goal of seeing if a cross comparison could be done successfully. The results of Brett’s (2018) study demonstrate that not only was a comparison possible, but that “additional analyses would help the library community identify what problems are shared” among institutions and would “help vendors identify systematic problems that need improvement” (p. 203).

In order to build upon the work by Brett (2018) and Goldfinger and Hemhauser (2016), the author analyzed two calendar years’ worth of e-resources troubleshooting tickets at The University of Alabama Libraries, categorizing tickets into the Functional Areas defined by

Goldfinger and Hemhauser (2016) in order to compare findings among three research institutions (University of Houston [UH]; University of Maryland, College Park [UM]; and The University of Alabama [UA]) and illuminate commonalities that may be indicative of larger, shared, and perhaps industry-wide issues. Likewise, the author examined The University of Alabama Libraries' tickets with a more specific, locally defined schema in order to reveal local trends or patterns and create proactive workflows for minimizing reports in the future. The author sought to answer the following questions:

1. Would a comparative analysis of troubleshooting tickets between three research institutions reveal patterns or similarities in problem reports? If so, what implications could be gleaned about the state of access to electronic resources beyond the study?
2. What does a locally defined coding schema reveal about access problems at The University of Alabama Libraries and how can proactive measures be implemented to decrease the amount of access interruptions going forward?

Literature Review

Troubleshooting analyses have been well documented in the literature with authors examining troubleshooting e-resource access through varied lenses, including locally analyzing reported access problems (Brett, 2018; Browning, 2015; Goldfinger & Hemhauser, 2016; Kimbrough, 2018; Wright, 2016), determining the most commonly used tools for troubleshooting (Heaton, 2018; Rathmel, Mobley, Pennington, & Chandler, 2015), highlighting innovative tools and best practices (Carter & Traill, 2017; Erb & Erb, 2014; Geuther & Turvey-Welch, 2018; Graham & Hosburgh, 2014; Kimbrough, 2018; Resnick & Clark, 2009), and surveying librarians and stakeholders about e-resource access (Foster & Williams, 2010;

Samples & Healy, 2014).

In 2014, Samples and Healy concluded that “electronic resource troubleshooting is almost entirely reactive” and recommended that librarians “take the time out of their own troubleshooting to mine their own data regarding access failure to improve electronic resource troubleshooting workflows” (p. 114). Many studies of troubleshooting reports or tickets were conducted with just that purpose, intending to enhance local workflows and/or to establish proactive rather than reactive measures to ensure the best user experience (Browning, 2015; Goldfinger & Hemhauser, 2016; Kimbrough, 2018; Mann & Sutton, 2015; Resnick & Clark, 2009; Wright, 2016). In one such study, Browning (2015) analyzed e-mail chains of reported access problems at Auraria Library in order to understand how improvements could be made to the library’s troubleshooting workflow. Browning (2015) sorted 100 reported problems into twenty five different categories using an original controlled vocabulary, articulating that classifying reports into a schema provided “the most interesting insight into the library’s access issues” (p. 32). At the time, Browning (2015) noted that “articles on collecting and analyzing troubleshooting data are lacking” (p. 27). However, because of this analysis, many local, positive changes to improve access were put in to place at Auraria Library, such as additional “Report a Problem” links on the library’s websites and methodical access checks by student workers using what Browning (2018) called a “quarterly e-resources spreadsheet” containing a list of all e-resources for the students to examine for problems.

Wright’s (2016) study at the University of Michigan examined troubleshooting tickets for the purpose of identifying patterns in outage type and the vendor involved in the outage as well as highlighting areas for improvement in local workflow. This study also involved a local classification schema in which to sort tickets, with Wright (2016) finding that the cause of most

outages, at twenty percent of the sample, fell into the broad “configuration” category, the definition of which encompassed problems with IP ranges, website navigation issues, and password problems, among many others (p. 207). As a result of the study, the University of Michigan’s Electronic Access Unit personnel made changes to the workflow when using the ticketing system so that outages can be more accurately organized and categorized for further and future analysis and tracking. Finally, the results of the study led Wright (2016) to elucidate that when it comes to metadata, there is “room for improvement” and that metadata problems were “greater and more endemic than a single paper can address” (p. 210). Wright (2016) continues to say that “no one institution can systematically rid itself of the kinds of errors seen repeatedly, across platforms, vendors, and content delivery services” but with sharing data gathered through tracking of these repeated problems, libraries “stand poised to improve the functionality of e-resources not just for their own patrons, but for patrons everywhere” (p. 212).

Goldfinger and Hemhauser (2016) at the University of Maryland, College Park analyzed over 300 troubleshooting tickets with the goal of understanding and comparing the nature of problems with that of other institutions. They, too, desired to develop best practices for troubleshooting at the University of Maryland, College Park and developed a controlled vocabulary in which to categorize tickets, classifying them first by problem type and then in more broad Functional Areas. Goldfinger and Hemhauser (2016) were able to propose multiple changes to the local troubleshooting workflow based on the results of the study, including the updating of a local Frequently Asked Questions site hosted by LibGuides that would help educate users on what to do when common access problems occur. Interestingly, though Goldfinger and Hemhauser (2016) set out to compare the study results with that of other institutions, the comparison was greatly hindered due to the differences in controlled vocabulary

of reported problems among librarians, as no shared controlled vocabulary or classification schema existed to cross compare institutions' reports (p. 92). Goldfinger and Hemhauser (2016) further noted that the categorization or coding of problems proved to be largely subjective and varied by institution, making an accurate comparison between two institutions nearly impossible, and that "for libraries to be able to compare results and communicate persistent problems to vendors, a group of practitioners should establish a shared vocabulary for access problems" (p. 92).

Brett's (2018) utilized the classification schema created by Goldfinger and Hemhauser (2016) in order to determine if a cross-comparative analysis of tickets between institutions would even be possible, as no standardized, proven schema existed. Brett's (2018) study confirmed that the Functional Areas created by Goldfinger and Hemhauser (2016) allowed for a good foundation upon which to base a standardized schema. As a result of the comparative analysis, Brett (2018) also asserted that "libraries need additional support from vendors to prevent and address e-resource access problems" with special emphasis on improving metadata (p. 203). Brett's (2018) assertion supports the seemingly common notion that accurate metadata supplied by vendors continues to be a pain point that should be further addressed (Donlan, 2007; Van Ballegooie, 2016; Wilson, 2016; Wright, 2016).

In fact, Wilson (2016) notes just how monumental the task of keeping an accurate and up to date knowledgebase can be, stating that the supply chain of metadata that feeds knowledgebases is complex, prone to errors, and difficult to manage due to the sheer amount of data moving through that supply chain (pp. 10-11). Diven (2013) and Van Ballegooie (2016) both note that vendors often deliver inaccurate or incomplete metadata, and that it is all too common to find problems such as title changes, incorrect coverage date ranges, and ceased titles

inaccurately reflected in a library's knowledgebase. The task of fixing these error and performing holdings maintenance "remains a time-consuming and manual process" (Van Ballegoie, 2016, p. 137). Wilson (2016) further articulates that though commercial knowledgebase providers employ many staff members dedicated to maintaining the knowledgebase, many errors still occur, causing a cascade of consequences across discovery for many libraries. Librarians can report knowledgebase errors to suppliers as they are discovered, but Wilson (2016) calls for more efforts to "close the gaps in the supply chain" and build "environments for greater collaboration" between vendors and librarians (p. 11). Both Diven (2013) and Van Ballegoie (2014) note that some of the motivating factors for developing open-source or community managed knowledgebases stems from shortfalls in the commercial knowledgebases offered. For example, the "perceived or real lag time" in updates to metadata in a commercial knowledgebase, avoiding duplicitous efforts in updating metadata, and the "unrestricted free use of metadata about local e-resource collections regardless of organizational affiliation" (Diven, p. 163).

Furthermore, even though classifying tickets into categories in order to analyze reports of problems provided great local information on trends and patterns for some studies, some authors highlight the struggle with the subjective nature of categorizing problems (Browning, 2015; Goldfinger & Hemhauser, 2019; Wright, 2016). Browning (2018) notes that classifying problems into the schema proved to be more difficult than originally expected and let the coding schema develop organically as the study progressed (p. 29). Further, Browning's (2015) team would sometimes take "their best educated guess" at the nature of a problem in order to categorize it, due to lack of information in the problem reports (p. 30). Wright (2016) agrees that categorizing access problems is not so straightforward, noting that "knowing how to group outages into

categories that can be reported may require many discussions and adjustments before reaching consensus” (p. 212). Goldfinger and Hemhauser (2016) worked to combat the ambiguous and often subjective nature of access reporting by categorizing the troubleshooting tickets at the University of Maryland, College Park first by problem type and then by broader Functional Areas so that each report more easily fit into one or both. At first, Goldfinger and Hemhauser (2016) found that the majority of troubleshooting tickets fell into the “other” category when assigning problem type, but the more broad Functional Areas allowed more of those tickets to be classified. Even though the classification schema was helpful at analyzing reports and creating local strategies for how best to help users, Goldfinger and Hemhauser (2016) noted that “grouping the tickets into patterns that can be compared across institutions requires consensus on how the problems and groupings are defined” (p. 92). Finally, both Brett (2018) and Goldfinger and Hemhauser (2016) argue that a shared vocabulary for categorizing troubleshooting problems should be developed by library professionals in order to make comparisons across institutions and highlight common or shared problems that can be addressed industry-wide rather than on a local level. Likewise, Samples and Healy (2014) reiterated the need for an established “Best Practices” for troubleshooting e-resource access problems.

Background

The University of Alabama’s students along with thousands of faculty, staff, alumni, and community members, perform millions of searches per year in The University of Alabama Libraries’ instance of EBSCO Discovery Service. The e-resources staff members in the Resource Acquisition and Discovery department of the University Libraries manages the majority of e-resources, including EBSCO Discovery Service, ensuring access through the link resolver (Full Text Finder) and the A-Z databases list hosted on LibGuides by SpringShare. Along with other

duties, each member of the e-resources staff pitches in to address access problem reports that come in from the University Libraries' ticketing system, KACE. The KACE system was first implemented for the e-resources staff members in 2013, but since that time, little has been done to analyze the contents of the e-resources tickets.

The path by which a ticket makes its way from a student or other library user to the e-resources ticket queue in KACE is not strictly linear. Across the library website there are "Report a Problem" forms in various places, most of which generate a KACE ticket that automatically goes to the Web Services department, with the exception of a few forms that populate to other queues in KACE, such as the queues for the staff in Office of Information Technology or the Cataloging and Metadata faculty and staff. University Libraries also has an "Ask a Librarian" form which populates a ticket in LibAnswers for library subject liaisons and reference librarians. Tickets appear in the e-resources queue by way of the University Libraries' faculty and staff via a non-public e-mail address. When library faculty or staff submit a report to that e-mail address, a ticket is populated in the KACE dashboard and sends a notification to all e-resources team members that a new ticket has been created. Additionally, tickets can be moved into the e-resources queue from another queue. For example, if a ticket is submitted by a student on a public "Report a Problem" form, staff in the Web Services department could move the ticket from the Web Services queue over to the e-resources queue if the contents of the ticket needed to be addressed by e-resources staff. At present, there is no direct path by which a patron can report a problem to the e-resources staff.

Methodology

The author began the study by deciding how many and which tickets in the e-resource queue to examine, as there were more than 1000 tickets saved, dating back six years. Since

collections, staff, tools, and systems change over time and with a relative frequency, the author sought to look only at more recent tickets so as to accurately reflect the current state of e-resources at The University of Alabama Libraries rather than a more historical sample. This “snapshot” strategy closely mirrors that of Brett (2018) and Goldfinger and Hemhauser (2016), in that a sample of tickets was selected for each of these studies that covers a three year period for a total of 305 and 312 reports, respectively (Brett, 2018; Goldfinger and Hemhauser, 2016). Therefore, the author selected every ticket in the e-resources queue with the status of “closed” that was initiated within the past two calendar years from the start date of the study and downloaded a report of these tickets from the KACE system into an Excel file¹. The resulting data were then stripped of any identifying or superfluous information by the author and examined. Duplicate tickets that were unknowingly created by library staff or a second ticket created in error to add more information to the original request were removed. Additionally, “test” tickets were removed, as testing of the reporting system often resulted in tickets being generated for the purpose of ensuring that KACE was in proper working order. Once the data were cleaned up, each line in the Excel spreadsheet represented a single instance of a problem report. This left 316 tickets to be examined dating from May 2017 to May 2019. The author used the unique KACE ticket number of each report in the spreadsheet to go back and examine the entire thread of correspondence within the KACE system so that the whole of the correspondence about each ticket could be analyzed and classified accordingly. The author assigned each ticket to one local category (see Table A1 of the appendix) and one Functional

¹ The date ranges chosen by the author were paired down to two years of tickets rather than three as Brett (2018) and Goldfinger and Hemhauser (2016). This change was made so that the number of tickets examined in this study more closely mirrors the number of tickets examined in the other studies.

Area (Table 1) as defined by Goldfinger and Hemhauser (2016). The results were then cross-compared with data from Brett (2018) and Goldfinger and Hemhauser (2016) and analyzed.

[Insert Table 1 near here]

Results

Goldfinger and Hemhauser's (2016) Functional Areas

A comparison across the three research libraries shows that the two most common problems at all three libraries fell into the categories of KB/Link Resolver or Platform (see Table 2). The University of Alabama and the University of Maryland, College Park show very close similarities in the percentage of problems regarding the knowledgebase and/or link resolver with 33% and 32% of each sample, respectively. This category measured lower in Brett's (2018) study at 17%, but was still the second most commonly reported problem overall at the University of Houston. In contrast, Brett's (2018) most frequently reported problems fell into the "Platform" category while the other two institutions found that "Platform" constituted the second most common problem.

Furthermore, the rate at which the tickets fell into the "Unknown/unable to be classified" category was identical between UM and UA with UH only trailing by two percentage points. While "User Error" and "Local Technical Problems" occurred at relatively similar rates at UH and UM, UA showed considerably lower rates than the other two institutions in both categories.

[Insert Table 2 near here]

Some of the least common problems occurring at all three institutions include “subscription problems,” “incorrect URLs,” and “patron authentication issues.” UA and UH both found that incorrect URLs accounted for 3% of the reports, while UM found that 6% of the tickets fell into this category. Subscription problems were both minimal and very comparable at all institutions, accounting for less than 3% at every school. The fewest number of reports for all three schools fell under “patron authentication problems” and “excessive downloading,” both of which accounted for 1% or less of the tickets in the study for all three institutions.

Perhaps the most disparate category among the three institutions was “proxy/IP” issues, with UH reporting 11% of tickets, UA recording 5% of tickets, and UM only finding 3% of tickets that fell into this category. Further, the percentage of tickets that fell into “local technical problems” was identical between Maryland and UH, but UA record far fewer by seven percentage points.

Locally defined categories

Similar to the results of the comparative analysis, the most frequently occurring reported problem in the locally defined categories involved the UA holdings management at 27% of the sample (see Table 3), while problems with OpenURL or link resolver accounted for 6% of the analyzed tickets. The second most frequently occurring problem involved a vendor outage, with 44 reports and 14% of the sample. Interestingly, the third and fourth most common types of ticket fell into the “Unknown” and “Other” categories, accounting for 9% of the sample of tickets each. These two categories encompassed all of those tickets in which the problem could not be ascertained or that did not easily fit into one of the locally defined categories. In fact, the “Other” category included such miscellany as library staff simply asking questions about resources, or correspondence that should have taken place outside of the ticketing system (e.g. a

request for a new resource).

[Insert Table 3 near here]

EZProxy problems accounted for 5% of the total tickets, just as it did in the comparative analysis, and 4% of the tickets involved referring the user to a different department for resolution. Three percent of tickets were requests to amend the A-Z Databases list hosted by Springshare, often encompassing such requests as to change subject headings or adding or removing databases from subject headings.

The “Bad record in catalog” category accounted for 3% of reported problems, with issues reported regarding incorrect coverage date ranges and broken links appearing in the catalog record for an electronic resource. Further, the “Concurrent user limits reached” category, specifically those reports of non-access that were actually the result of the user hitting the maximum user limit, accounted for 2% of tickets and often resulted in upgrading e-books to higher user limits, if the ticket concerned an e-book. Turn away on non-subscribed resources accounted for only 2% of reported problems as well, along with problems with DDA e-books also occurring in 2% of the sample. The least common problem overall was “accessing cancelled titles/resource” in which a user may have tried to access a title that had been cancelled but somehow had not been removed from discovery.

Discussion

Goldfinger and Hemhauser (2016) Functional Areas

The cross-comparison of results demonstrates that certain types of access problems do

occur at similar rates among research institutions, despite the likely differences in workflows, tools, management styles, and varying collections among them. The high rate of tickets at each institution relating to the knowledgebase or link resolver suggests that access errors relating to these tools may be a common problem at other research libraries or beyond. As many authors have suggested, metadata provided by vendors and publishers may be at the root of many reported access problems in the knowledgebase and link resolver, along with problems related to the transfer of such metadata and the possible delays in that transfer (Brett, 2018; Donlan, 2007; Van Ballegooie, 2016; Wilson, 2016; Wright, 2016). One author opined that the knowledgebase “has truly become the center of the management universe for academic and research libraries” (Wilson, 2016, p. 8), and indeed, the data in the knowledgebase at The University of Alabama Libraries is the structure around which discovery stands, as the metadata from it populates EBSCO Discovery, E-Journal finder, the link resolver, and many catalog records. From the results of this study and the literature, it stands to reason that a high number of access problem reports would be related to errors in the knowledgebase, since the data stored there flows throughout most aspects of discovery, and the sheer volume and variability of that data lends itself to inevitable errors. Moreover, Wilson (2016) points out that the data from providers that populates the knowledgebase changes so rapidly that all stakeholders across the supply chain grapple with the volume of work necessary to keep a knowledgebase up to date. Even with a data validation process and customer support in place for error reporting, the rapid changes throughout the life cycle of an e-resource makes fertile ground for errors. Wilson (2016) also calls the metadata provided by publishers a “secondary artifact” rather than a priority for publishers (p.10), implying that publishers do not put forth as much effort towards delivering quality metadata as is necessary to reduce errors. Indeed, the results of the study underscore the

assertions of many who find problematic metadata to be at the root of access problems.

In contrast to the other two institutions in the study, the University of Houston showed the highest rate of problems related to “Platform,” though this category proved to be the second highest category for The University of Alabama and the University of Maryland, College Park. The definition of the “Platform” category of the Functional Areas encompasses many different types of outages, including activation errors, missing content, platform maintenance or down-time, and general platform malfunctions (Goldfinger & Hemhauser, 2016). Accordingly, the high rate of tickets that fall into this category may be because the category could include many different types of problems, in contrast to other Functional Areas such as “Patron Authentication” which is narrower. Research institutions with large collections often rely on hundreds of vendors and platforms to deliver information to users, and there is no practical way to ensure that the vast amount of vendors who provide resources for libraries will keep platforms functioning in the most efficient manner all day every day. If nothing else, this data point demonstrates that vendors need to recognize that a high level of usability along with very low occurrences of down-time and outages will make for a better product and user experience for researchers. Vendors should also ensure that communications about outages and downtime are forthcoming and timely, as those cannot always be completely avoided. Finally, problems with vendor platforms are very often out of the hands of librarians, whose course of action when a platform goes down is simply to inform both the vendor and the user of the outage. Comparative analyses such as this study could be used to help the library community communicate concerns with vendors over excessive platform problems, and local studies could be completed in order to pinpoint problematic vendors, perhaps to the benefit of both libraries and vendors going forward.

Remarkably, the percentage of questions that were considered “Unknown, unable to be classified” were almost identical at all three institutions. Brett (2018) notes that the two main reasons tickets fell into this category were that there was not sufficient information in the ticket to ascertain the problem, or the reported access issue did not fall into any other category within the Functional Areas. In the UA sample, some tickets that fell into this category were such that the user simply did not respond to a request for more information. Further, some instances of these tickets were referred to another department for consideration, as the ticket did not fall into the scope of e-resources. Some of the more interesting tickets in the UA sample that could not be classified presented odd or perhaps rare problems. For example, one such ticket involved a faculty member who reported that the content in an EBSCO Research Starter was factually inaccurate and seemed to demonstrate bias. While we reported the concern to appropriate parties, this ticket did not fit within any of the categories of the Functional Areas. A more in-depth study on these types of tickets might reveal problems that could be addressed locally to minimize occurrences, however it is the opinion of the author that lessening the amount of odd problems reported by users would be quite difficult. The fact that many of the problems in this category were the result of the user not following up or providing more information about the problem could potentially be addressed at a local level if one could pinpoint exactly where communication is breaking down, but further study would be needed in order to effectively address how such reports could be minimized or what other categories could be created in the schema to classify these tickets, if any.

Subscription problems occurred in less than 3% of tickets at all three institutions, encompassing such problems as a subscription expiration causing loss of content, title transfers or cancellations, or other miscellany. Many of the tickets in the UA sample that fell into this

category concerned a particular product provided to us from the Alabama Virtual Library in which access was cut off while license terms were re-negotiated. Further examples from UA's tickets included reports of access problems to an e-serial in which the e-resources staff discovered that some titles were removed from a package and bought by another publisher, requiring that the title to be purchased outside of a package in order to regain access. It is common for titles to be bought and sold to other providers. Often, the process of a title transferring to another provider is so seamless that it goes unnoticed while the knowledgebase is updated. However, sometimes titles in a package may be sold to another publisher and access is lost, prompting a troubleshooting ticket to be submitted if the knowledgebase has not yet been updated to reflect the changes or if the library has not yet negotiated to purchase the title from another vendor. Though subscription problems did not occur as frequently as other types of problems, the low number of reports in this area for all three institutions is likewise informative that perhaps the workflows and initiatives in place to mitigate the changes that result from acquisition, deselection, title changes and transfers of e-serials are working rather effectively. PIE-J and the Transfer Code of Practice are two community-led initiatives that have helped alleviate some of the work of keeping track of title changes and transfers, but most of the labor that goes into maintaining subscriptions falls upon the shoulders of librarians to process renewals and liaise with vendors regarding licenses, payments, and access activation. From this study, it is clear that managing subscription changes, a task that is often within the scope and control of e-collection managers, is well achieved.

Though many data points in this study show that some types of problems occur at very similar rates, interestingly there are some major differences in a few areas. For instance, UA Libraries showed considerably fewer reports of user errors in this study than the other two

research libraries who showed very comparable rates. This is perhaps due to the workflow of how the e-resources staff receives troubleshooting tickets. According to Brett (2018), the University of Houston's troubleshooting tickets come in to the e-resources staff both externally and internally. Likewise, Goldfinger and Hemhauser (2016) note that the University of Maryland, College Park receives tickets in the same manner. Therefore, The University of Alabama's tickets are the only ones in the study that originate internally only, and it is likely that user errors are solved by library liaisons, reference librarians, or the Web Services department before the ticket comes to the e-resources queue, possibly accounting for the lower number of tickets from the sample in this area.

The reports of Proxy/IP problems at each institution varied greatly among the three institutions, and this variance in distribution may be due to differing responsibilities and/or workflow of the e-resources staff at each library. At The University of Alabama, EZProxy is managed by the Systems and Technical Services Librarian outside of the e-resources staff, however, it is not unusual for EZProxy management to be within the scope of an e-resources librarian or staff member at many institutions rather than in another area or department. Additionally, there are a few commercially available tools for managing proxy services, including OpenAthens, WAM, and OCLC's EZProxy. Each of these work a bit differently and many times in conjunction with a university's overall user authentication process, sometimes bringing campus IT into the management of users and authentication. It is possible that the three institutions in this study differ greatly in how user authentication is managed, accounting for the differences in distribution in this category. What's more, the lack of reports of patron authentication issues could mean that the distribution of labor at these institutions allow for other staff members besides e-resources staff to handle or "filter out" these problems before they are

reported to e-resources. At The University of Alabama, patron authentication is also managed by the Systems and Technical Services Librarian, who has a separate ticket queue in which to receive problem reports. Problems with patron authentication often go directly to that faculty member without ending up in the e-resources ticket queue, which may account for the lack of reports of this nature in The University of Alabama tickets. No matter the workflow at each institution, a high number of reports based on Proxy/IP problems would indicate the need for proactive measures at the local level. The fact that Proxy/IP issues varied greatly across these three institutions only underscores the fact that local workflows are the likely culprit for these problem reports rather than a wider, perhaps industry-wide concern. Further study would be needed in order to compare the efficacy of particular authentication tools and frequency of problem reports.

Correspondingly, the most rarely occurring type of problem for all three schools was “Excessive Downloading” which illuminates the fact that all three schools, and likely beyond, have effective, local measures in place to address this activity. Though excessive downloading of resources is an important concern, the fact that there are so few reports in this study speaks to the effectiveness of the work both librarians and vendors do to combat such behavior.

Locally defined categories

Holdings Management/Knowledgebase accounted for the most common types of problems reported in the UA ticket sample, similar to that of the comparative analysis. A closer look at the tickets that fell within this category reveals that reports often concerned inaccurate coverage date ranges for titles, titles being activated or inactivated in error, and incorrect or delayed updates to knowledgebase data. In fact, 2.8% of the entire ticket sample were attributed to problems with incorrect coverage date ranges in holdings management, almost equal in

number to the reports of a “Bad Link” or “A-Z list management” requests. The e-resources staff spend many hours per week working diligently to keep resources activated in the knowledgebase as accurately as possible, though EBSCO is able to do the majority of that work automatically through EBSCOnet. The libraries have little control over the metadata that is supplied to the knowledgebase which populates information such as coverage date ranges and links to content, but proactive measures to cross-check subscription entitles with the knowledgebase as well as fully investigating problem reports already keeps reports of problems down.

Most interestingly, the Full Text Finder not resolving to the target accounted for 6% of UA’s reports. The link resolver and knowledgebase were deliberately separated in to the two, more specific categories for the local analysis, though they are heavily intertwined. This distinction gives a glimpse of the breakdown between the two components of discovery and which area seems to be failing the most often. With only 6% of reports being related to an unresolved Full Text Finder link while 27% of reports were with errors in the knowledgebase, it is clear that the majority of reported problems with failed access have more to do with inaccuracies in the knowledgebase or holdings management rather than in bad metadata resulting in a failed Full Text Finder link. However, it is likely that the fewer reports of failed Full Text Finder links could be due to the nature of the UA link resolver within EBSCO Discovery. For instance, if a user encountered a faulty Full Text Finder link, EBSCO Discovery may provide an alternative method of getting to full text within the record, such as a persistent link or PDF full text. If a user can get to content easily by alternative means, that user may be less likely to report a problem with the Full Text Finder link. Further analysis would be needed in order to determine the rate at which Full Text Finder links fail to resolve in The University of Alabama’s instance of EBSCO Discovery Service.

Vendor outages accounted for the second most common types of problem reports at 14% of the sample, including such problems as platform outages, error messages, or scheduled maintenance. The definition of this local category encompasses all of those tickets where problems occur on a platform by the fault of the vendor. The e-resources team has little control over vendor outages, and has a workflow in place to inform the library staff of upcoming maintenance or scheduled down-time. However, a closer look at the tickets that fell into this category reveal that some databases experience unscheduled or intermittent downtime far more than others. For example, over the period of two years, there were three different reports of an outage for the same foreign language database, and each time, the vendor had to be contacted to restore access. Likewise, another database appeared twice in this category where the vendor had to be contacted in order to restore access, and though the analysis of tickets concluded in May 2019, two more reports of outages outside of the sample were made in late 2019 for this same database. Current proactive measures to ensure that all databases are functioning as normal include receiving vendor alert e-mails of outages and quarterly checking of URLs in the Databases A-Z list. Many problems are solved via these two proactive processes, but as a vendor outage can sometimes occur unexpectedly, e-resources staff cannot always catch every problem with these methods. Additionally, some vendors are more communicative than others about website outages or errors, so while the e-resources staff can notify library staff ahead of a planned outage or during an unscheduled outage, it is very difficult to ensure that library staff are informed of each and every one. It is clear from this local analysis that for some vendors, a conversation regarding the excess amount of down time over the past two years may need to be had in order to yield fewer reports and make the vendors aware of the ongoing problems. Many

vendors also need to consider the frequency of these types of problems for libraries and adjust accordingly in order to deliver the best product.

The number of tickets that fell into the remaining categories represent a smaller number of reports, most of which were under 5% of the sample, with the exception of the “Unknown” and “Other” categories. Some reports of problems are to be expected in any library, but the few reports regarding User Error, EZProxy problems, Subscription Issues, and the like are encouraging, as these problems do not seem to be the predominant issues encountered by the library staff at The University of Alabama Libraries. Likewise, it seems that many of the problems experienced at higher rates are often due to factors out of the control of e-resources staff, so communication and collaboration with both vendors and stakeholders may be the best course of action for remedying future reports.

Tickets from library staff are often the catalyst for a thorough investigation of why problems occur and how to keep problems from re-occurring. In fact, collaboration between public services staff and the e-resources staff is one of the best ways to make sure that databases and discovery are fully functioning. Donlan (2007) reinforced the idea that troubleshooting is not localized to e-resources staff, but is rather a library-wide concern: “Reference librarians should participate in this process as much as technical services and systems librarians, since they deal with the fallout of bad data everyday” (p. 103). Foster & Williams (2010) further underscored the often overlooked potential for collaboration among public and technical services staff in addressing access problems, emphasizing that those staff in public services have “a significant role in the problem-reporting process” (p. 133). Indeed, the e-resources staff often do not know that a problem is occurring unless it is reported by a user. Perhaps the best proactive measure that e-resources staff at The University of Alabama could implement considering the

results of this study would be to empower public services faculty and staff to better understand and report access issues so that frustrations are minimized. Likewise, e-resources staff need to be equally empowered to report recurring problems to vendors, whether that is through an analysis of problem reports to reveal patterns or simply day-to-day reported problems that cause significant issues for users.

Limitations

Though similarities in the frequency with which access problems are reported at the three libraries in the study make it clear that common pain points exist across institutions, some limitations in the comparisons between the reported problems still make an accurate comparison quite challenging. For instance, at The University of Alabama, some library staff will report multiple problems in one ticket while others create a separate ticket for each problem encountered, which may artificially inflate the numbers of reported issues within a certain category. In one instance, one library staff member reported nine problems with coverage date ranges in nine separate tickets, however, it was not unusual for a library staff or faculty member to report two problems with coverage date ranges within one ticket. For this study, one ticket was counted for each, individual submission, even though two reported access problems might be within one ticket.

Further, each research institution studied subscribes to different databases, journals, tools, and electronic resources, and manages them with different workflows, tools and methods. In fact, according to Library Technology Guides, each institution in this study subscribes to a different discovery service and link resolver, with no common vendor between the three for discovery or link resolver tools (Breeding, 2019). These differences were not studied in depth here, and a further analysis would be needed in order to make any comparisons on vendor products. What's

more, the culture of each library may account for differences in the types and frequencies of reports in this study. Foster and Williams' (2010) study concluded that, in general, "users are more likely to not report problems than they were very likely to report them" (p. 128) and found that the most common reason for not reporting a problem was that the patron was unsure whom to contact. Samples and Healy (2014) found that only 14% of libraries utilize a staff-only form for reporting access problems while 57% have forms that are both patron facing and internal. In this study The University of Alabama utilized an internal reporting mechanism while the University of Houston and the University of Maryland, College Park had both internal and external reporting channels, which may have accounted for major differences in the rates at which problems were reported.

Finally, as many of the common problems at all three institutions can be attributed to issues with vendor-supplied metadata or platforms, differences in the rates at which these occur could be down to which vendors are supplying the services to which libraries, though to understand which vendor may provide better metadata and tools for managing e-resources is beyond the scope of this study.

Conclusion

The results of the study demonstrate that a cross comparison of access problems among institutions is not only possible, but highly indicative that research libraries experience some types of access problems at approximately the same rates. The prevalence of problems with knowledgebases and link resolvers as well as vendor platforms among the three institutions supports the collective assertion that vendors need to improve both metadata and usability of platforms in order to decrease problems with access. Goldfinger and Hemhauser (2016) have created a controlled vocabulary that lends itself well to cross comparisons among institutions,

and further studies can easily depend on the shared vocabulary in order to perform more cross comparisons for a more in-depth look at the broader landscape of troubleshooting e-access. A much larger study comparing similar institutions using Goldfinger and Hemhauser's (2016) Functional Areas as a coding schema may be needed in order to make the most accurate assessments on the most commonly reported access problems among libraries; however, the cross comparison of these three institutions is a start to ascertaining what may be the most prevalent pain points in the industry that could be addressed with vendors to enhance the experience of researchers and diminish the upkeep and manual workflows performed by librarians managing these tools. Further study could also cross-compare two research institutions that are using the same vendor for the knowledgebase, discovery, and link resolver in order to shed light upon particular problems that may be vendor specific. Effective communication among users, librarians, and vendors is paramount to ensuring access is maintained successfully, and efforts can and should be made by both librarians and vendors to shore up these channels. Finally, one inescapable fact learned from this study is that effective discovery is highly dependent upon the services and metadata provided by vendors, and efforts to improve those aspects should be at the center of knowledgebase product improvement and at the forefront of the minds of librarians when communicating and negotiating with vendors.

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Appendix

[Insert Table A1 here]